Healthcare quality in Ghana
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Healthcare Quality in Ghana

Improving healthcare quality and health worker motivation to promote sustainable health insurance

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TABLE OF CONTENTS

Abbreviations 7

Chapter 1 General Introduction 9

PART 1 Baseline studies

Chapter 2 Association between health worker motivation and healthcare quality efforts in Ghana
BMC Human Resources for Health 2013, 11(37):1-11

Chapter 3 Comparison of perceived and technical healthcare quality in primary health facilities: implications for a sustainable national health insurance scheme in Ghana
PLoS ONE 2015, 10(10):1-19

Chapter 4 Efficiency of private and public primary health facilities accredited by the National Health Insurance Authority in Ghana
BMC Cost Effectiveness and Resource Allocation 2015 13(23):1-14

PART 2 Post interventions studies

Chapter 5 Effect of community engagement interventions on patient safety and risk reduction efforts in primary health facilities: evidence from Ghana

Chapter 6 Assessing the impact of community engagement interventions on health worker motivation and experiences with clients in primary health facilities in Ghana: a randomized cluster trial

Chapter 7 Perspectives of frontline health workers on Ghana’s National Health Insurance Scheme before and after community engagement interventions
BMC Health Services Research, 2016 16(192): 1-11
ABBREVIATIONS

ANC  Antenatal Care
ATT  Average Treatment Effect on the Treated
AU   African Union
CHAG Christian Health Association of Ghana
CHI  Community Health Insurance
CHPS Community-based Health Planning and Services
CHVs Community Health Volunteers
COHSASA Council for Health Services Accreditation of Southern Africa
CPCs Claims Processing Centres
CRS  Constant Returns to Scale
DEA  Data Envelopment Analysis
DEAP Data Envelopment Analysis Programme
DHMTs District Health Management Teams
DiD Difference-in-difference
DMHISs District Mutual Health Insurance Schemes
DMUs Decision Making Units
EAs  Enumeration Areas
ERC: Ethical Review Committee
FGDs  Focused Group Discussions
FP   Family Planning
GAR Greater Accra Region
GDP  Gross Domestic Product
GHS  Ghana Health Service
GHWO Ghana Health Workers Observatory
GoG Government of Ghana
HHS  Household Surveys
HSHR Health Sector Human Resource
ICD Institutional Care Division
IMMR Institutional Maternal Mortality Rate
IoM Institute of Medicine
IPD  Inpatient Department
JCI  Joint Commission International
LE   Light Engagement
LMICs Lower Middle Income Countries
M&DAs Municipal and District Assemblies
MDGs Millennium Development Goals
MoH  Ministry of Health
CHAPTER 1

General Introduction
Chapter 1

BACKGROUND

Universal access to basic quality healthcare services remains critical for national growth and development [1]. In light of this, the World Health Organisation (WHO) and over 500 leading health development organisations worldwide renewed their commitment to universal health coverage (UHC) in the year 2014 and called on governments to accelerate reforms that ensure everyone, everywhere, can access quality health services to avoid being forced into poverty due to catastrophic health expenditures [2].

Although some progress has been made by many developed countries towards attaining UHC, resource-poor countries in Africa have not achieved much. An estimated 150 million people, many of whom reside in Africa, suffer financial catastrophe each year because they have to pay out-of-pocket (OOP) for health services [3]. OOP payment for health services continues to force many households into lower wealth quintiles and worsen health outcomes among the poor in many African countries including Ghana [1].

Africa still hosts inordinate proportions of the world’s disease burden and mortality rates largely due to limited access to quality basic healthcare services. Maternal mortality ratio in the sub-Saharan African (SSA) region remains at 510 deaths per 100,000 live births, higher than the global average of 210 per 100,000 live births [3]. In 2013, sub-Saharan Africa region alone accounted for 62% of the estimated 289,000 maternal deaths globally. Likewise, the proportion of births attended to by skilled health personnel is below 50% in Africa compared to over 90% in Organisation for Economic Cooperation and Development (OECD) countries [3].

The WHO outlined a number of interrelated problems that constrain countries from achieving UHC and optimum health outcomes. These include limited health resources, over-reliance on OOP, and inefficient use of limited available resources [1]. As part of efforts towards attaining UHC and improving access to quality basic healthcare, Ghana introduced the first ever national health insurance scheme (NHIS) in sub-Saharan Africa in 2003. As at 2014, about 40% of the Ghanaian population has been actively enrolled in the NHIS and over 4,000 public and private healthcare facilities accredited as NHIS service providers [4].

Though the NHIS has contributed to enhanced financial accessibility to health services and improved health outcomes, the scheme is increasingly challenged by financial and operational sustainability threats [4-6] resulting in low stakeholder trust in the scheme. Clients’ concerns of poor quality healthcare services in NHIS-accredited health facilities, limited knowledge on NHIS benefits package, and delayed provider reimbursement by the National Health Insurance Authority (NHIA) are particularly high and pose substantial threat to the NHIS sustainability [5,7,8]. Considering that the healthcare provider is a client of the NHIS, these challenges potentially reduce willingness to participate in the scheme largely because the NHIA does not appear to deliver on its promises.

These emerging challenges demand the need to explore and, if deemed promising, implement more innovative client-centred strategies and effective stakeholder engagement. Such approach could enhance trust in the NHIS and the Ghanaian healthcare system at large. Moreover, strengthening existing state and private sector institutions with the requisite human and material resources could help address institutional challenges hampering successful implementation of the NHIS. Also, adopting emerging health technologies (e-Health and m-Health) and promoting clients’ and healthcare providers’ trust in the quality of NHIS services are important building blocks for a sustainable NHIS and realisation of UHC in Ghana.

COUNTRY CONTEXT

Ghana is a sub-Saharan African country with a land area of 239,000 sq. km and shares boundaries with Cote d’Ivoire to the west, Togo to the east, Burkina Faso to the north and the Gulf of Guinea to the south. The country has ten (10) administrative regions and 216 metropolitan, municipal and district assemblies (MMDAs) with substantially devolved financial and political powers [9]. As at 2015, the population of Ghana was approximately 26.9 million people constituting 51% females and 49% males with a population density of 109 persons per sq. km [9,10]. About 70% of the population lives in urban and peri-urban areas largely due to unabated rural-urban migration [9].

Ghana’s average Gross Domestic Product (GDP) growth rate between 2012 and 2013 was 7.6% [11] and the dependency ratio was 0.72 per productive member (15-64 years) [12]. The Gross National Income (GNI) per capita was US$ 1,770 as at 2013, marginally higher than the sub-Saharan African average of US$ 1,686 but lower than the global average of US$ 10,683 [11]. An estimated 67% of the population works in the informal sector with agriculture being the predominant economic activity of the people [11]. Life expectancy at birth in Ghana improved over the years from a low of 45 years in 1957 to 62 years in 2013 [13]. Malaria is the main cause of morbidity and mortality in Ghana accounting for nearly 50% of all outpatient cases and close to 20% of all deaths in health facilities [13].

OVERVIEW OF GHANA’S HEALTHCARE SYSTEM

Structure and governance

Ghana’s healthcare system is divided into five functional levels of national, regional, district, sub-district and community levels. At the national level, the Ministry of Health (MoH) is responsible for the administration of health services and provision of an integrated and comprehensive system of healthcare throughout the country. The MoH is mandated to formulate health policies, mobilize and allocate resources, monitor and evaluate overall health sector performance.

The Ghana Health Service (GHS) is an agency under the MoH created by parliamentary Act (525) in 1996 to manage the provision of primary, secondary and some specialist care. The GHS operates under a council appointed by the President of Ghana on the advice of a presidential advisory body called Council of State. The four (4) teaching hospitals in the country are semi-autonomous MoH agencies charged with the responsibility of rendering tertiary healthcare and are governed by a board appointed by the President of Ghana.
Below the national GHS are the Regional Health Administrations (RHAs) located in each of the ten administrative regions. The RHAs are responsible for developing strategic regional health plans within the framework of national policies; implementing guidelines as formulated by the MoH; resource allocation within the region and monitoring the performance of District Health Management Teams (DHMTs). DHMTs are mandated with operational planning and implementation at the district level. The DHMTs also monitor and supervise district hospitals and sub-district health facilities such as polyclinics, clinics, health centres and Community-based Health Planning and Services (CHPS) zones.

The formal and informal private sectors are regulated by the MoH in collaboration with the Society of Private Medical and Dental Practitioners (SPMDPs), Christian Health Association of Ghana (CHAG), Private Hospitals and Maternity Homes Board (PHMHB) and the Traditional Medical Council (TMC, Act 575). In 2015, the PHMHB was converted to the Health Facilities Regulatory Agency (HEFRA) and mandated to accredit public and private healthcare facilities in the country. Figure 1 shows the structure of the health sector service delivery in Ghana.

Health sector governance in Ghana is not without challenges. First, appointment of governing councils of the GHS, teaching hospitals and other MoH agencies by the president of Ghana is a potential challenge because it could breed political interference in the activities of MoH agencies. Political interference in health sector governance could result in disjointed health policy formulation and implementation since most political parties in Ghana appear to have divergent ideologies that do not promote continuity of policy agenda from one government to another. Finally, ineffective monitoring and supervision, largely due to human and material resource constraints, impede effective regulation of the public and private health sectors to ensure adherence to professional standard practices.

Health sector human resources

According to the 2011 Ghana Health Workers Observatory report, there are over 52,000 individuals formally working in the public and private health sectors in Ghana [14]. Out of this number, the MoH employs about 82% to work in GHS health facilities, teaching hospitals, CHAG health facilities, health training institutions, and the national headquarters.

Clinical staff represent approximately 38% of the national health workforce while non-clinical/support staff constitute 62%. The health worker: population ratio has seen marginal improvements over the years with the doctor: population ratio reducing from 1:13,683 in 2007 to 1:10,452 in 2012; the nurse: population ratio improved from 1:1,537 in 2007 to 1:1,251 in 2012 [13]. Notwithstanding these improvements, there are rural-urban disparities in the distribution of health sector human resources. Over 70% of core clinical staff such as medical doctors, nursing professionals and pharmacists work in urban areas [14].

In terms of age distribution, close to 38% of Ghana’s health workforce age between 40-50 years and approximately 25% age between 18-39 years. Physician assistants and midwives who are mostly at the primary healthcare level are closest to the retirement age of 60 years [14].
The sub-district/district level is the lowest level of healthcare championed by community-sub-district and district (primary), regional (secondary) and national (tertiary). Health service provision is organised in three tiers (bottom-up) from the informal care givers, about 1,700 are owned by government and quasi-government institutions (not-for-profit). Out of the over 5,000 health facilities in Ghana (excluding chemical sellers and informal care givers), about 1,700 are owned by government and quasi-government institutions and the remaining are owned by faith-based organisations and private-for-profit individuals and groups [15]. Majorly, private-for-profit health facilities render services in urban areas while faith-based facilities are predominantly located in rural areas. Even though, the above arrangement is meant to ensure an effective gatekeeper system in the service delivery process, the country is currently far from the ideal situation because teaching hospitals still render primary curative services which are supposed to be managed at the primary and secondary levels. Low client education and perceived poor service quality at lower levels of the healthcare system are some factors responsible for the ineffective gatekeeper system.

Introduction of the capitation system in selected regions is an intervention that promises to ensure effective gatekeeper system. Under the capitation system, NHIS clients are assigned to their preferred primary service providers and referred to higher levels where necessary. Improved client education and service quality standards at all levels of the healthcare system could encourage better adherence to the gatekeeper system.

Health service provision
The healthcare system in Ghana evolved from a purely traditional system to an allopathic (orthodox) system. Over the years, Ghana’s healthcare system has increasingly become diverse involving public and private healthcare providers in service delivery. Within the public and private sectors, formal health service provision is organised in three tiers (bottom-up) from the sub-district and district (primary), regional (secondary) and national (tertiary).

The sub-district/district level is the lowest level of healthcare championed by community-based service providers, CHPS compounds, health centres, clinics and district hospitals. The focus of service delivery at this level is supposed to be preventive health, health education and community participation in health services planning and implementation. However, the reality is almost all CHPS compounds render curative healthcare with the argument that the NHIS is not paying for preventative health services. At the apex of service delivery at the district level are the district hospitals where curative and preventative health services are rendered. Referred cases from the sub-district level are either managed and discharged or referred to the regional (secondary level) or teaching hospitals (tertiary level) for specialized care. Health service provision at the secondary and tertiary levels are more specialized coupled with the responsibility of training health professionals and medical research (see Figure 2). Tertiary level care is mainly provided by the four main teaching hospitals in Ghana where there are currently no equivalent private sector service providers.

Besides the public sector, approximately 50% of health services are rendered by private healthcare facilities either owned by private individuals (for-profit) or faith-based organisations (not-for-profit). Out of the over 5,000 health facilities in Ghana (excluding chemical sellers and informal care givers), about 1,700 are owned by government and quasi-government institutions and the remaining are owned by faith-based organisations and private-for-profit individuals and groups [15]. Majority of private-for-profit health facilities render services in urban areas while faith-based facilities are predominantly located in rural areas.

Healthcare quality and regulation in Ghana
Structured quality healthcare and Quality Assurance (QA) activities within the Ghana Health Service (GHS) were initiated by Bannerman et al. [16] who developed a quality improvement framework for healthcare facilities based on client-perceived and technical care dimensions. In this framework, client-perceived quality healthcare markers include client satisfaction with affordability of fees, promptness of attention, good staff attitude, respect for patients and their rights, provision of privacy and confidentiality provision of adequate information, availability of drugs and other logistics, and clean environment. The technical quality healthcare dimensions include availability of standard protocols, adherence to standards and professional ethics, outcome of treatment, human resources development, adequate drugs and logistics.
The GHS QA strategic plan [17] adopted the Institute of Medicine (IoM) and WHO principles of safety, efficiency, effectiveness, accessibility and appropriateness [18,19] as critical components of a client-centred healthcare system. In Ghana, quality healthcare in clinical settings is managed by the Institutional Care Division (ICD) of the GHS. The ICD operates on the tenets of a five-year QA strategic plan which is a key source of guidelines on QA and monitoring in healthcare facilities [17].

Strategic objectives of the ICD are to improve client-focused services; patient safety; clinical practice, management systems and accountability [17]. The ICD core activities include formulating policies on operational guidelines and standards for health facilities; production and use of tools for monitoring and supervision; in-service training to improve competencies of health staff; and conducting supervision and monitoring. Activities of the ICD have been decentralized through established regional and institutional QA teams. Limited financial and logistical resources and inadequate technical expertise are important constraints to effective operations of the ICD [17].

Besides activities of the ICD, the NHIA accreditation process is an important quality improvement strategy formally initiated in 2009 by a broad spectrum of stakeholders with technical support from the PharmAccess Foundation [a Dutch non-governmental organisation] [20]. By law, NHIS accreditation certificate is valid for five years on first issuance and subsequently reviewed every two years [20]. To ensure quality healthcare standards are maintained in accredited health facilities, post accreditation monitoring is performed through regional NHIA offices, clinical audits and claims processing [20].

Major challenges of the NHIA accreditation system include lack of permanent accreditation teams to consistently inspect and accredit health facilities. Ad hoc teams are often constituted for accreditation exercises and dissolved afterwards. Furthermore, there is the potential for unequal application of the accreditation standards to public and private facilities [20]. The NHIA is challenged with the problem of strictly applying accreditation standards to public health facilities that are the sole source of healthcare in a community. Disaccrediting such facilities will mean depriving the community of access to healthcare altogether. Private facilities, mostly located in urban areas, might not enjoy this privilege since they are often not the sole source of healthcare in a community [20].

Other criticism of the NHIA accreditation system is that the accreditation process accredits facilities and not health practitioners. The accreditation grade assigned to a health facility is the sole source of healthcare in a community. Disaccrediting such facilities will mean depriving the community of access to healthcare altogether. Private facilities, mostly located in urban areas, might not enjoy this privilege since they are often not the sole source of healthcare in a community [20].

The NHIA is a community-based organization that accredits health facilities and grants them financial incentives to improve their quality of care. This system is designed to enhance the quality of healthcare in Ghana, and it is supported by the Ghana Health Service, the Ministry of Health, and other stakeholders. The NHIA accreditation process is an important quality improvement strategy that formally initiated in 2009. The NHIA accreditation system is accountable to the NHIS, the only health insurance scheme in Ghana.

Healthcare financing in Ghana

History of healthcare financing

Ghana evolved through a number of stages in healthcare financing. During the pre-colonial era, healthcare financing involved individuals paying for their healthcare needs from native “doctors” and faith healers. Providers of healthcare in the pre-colonial era were found in families and the beneficiaries paid through gifts and running errands for the health providers such as fetish priests and herbalists [22]. Though traditional medical care was not free per se, the payment mechanism was flexible and negotiable [23]. Clients were not denied treatment for inability to honour immediate charges because there were credit arrangements for clients who could not immediately pay [23].

After British colonization of the Gold Coast (now Ghana), healthcare was financed by both the state and the individual. The hospital fee system became operational after the first colonial
hospital was built in 1868 [23]. This was followed by enactment of the Hospital and Dispensary Fee Ordinance (HDFO) in 1898. The HDFO required that government officials and their dependents pay a small per diem only in the case of admissions. Non-official Africans paid a specified amount per day depending on the type of occupation and status of the client. Non-official Europeans also had to pay a small fee to the hospital and the medical officer when they sought treatment [23]. Payment of these fees attracted some resentments from Africans and non-official Europeans because the fees were expensive for them [23].

More structured modern healthcare system started in Ghana in the 1920s when the first modern equipped hospital was commissioned in 1923. During this period, government's expenditure on health ranged between 16-18% [24]. Later in 1942, the Hospital Fee Ordinance (HFO) was introduced, resulting in increased outpatient fees [25].

When Ghana assumed self-rule in 1951 there were reforms which incorporated the Medical Services Department into a Ministry of Health (MoH). Subsequently, a commission set up to review the health needs of the then Gold Coast, recommended abolishing hospital fees and charges. This recommendation was however criticized because there was no clear direction on how healthcare will be financed without user fees. Arhinful [23] argued this lapse created an everlasting problem for health financing in Ghana till date.

At independence, healthcare was purely funded by the state because the political system then was socialism. Free outpatient care for Ghanaians and non-Ghanaians was introduced in 1962 while civil servants and members of the security were charged a token fee for inpatient treatment and drugs [23]. Mission/faith-based hospitals were reimbursed for services rendered to the various categories of people. It is argued these financing mechanisms resulted in revenue shortfalls to the health sector, which also affected acquisition of capital-intensive equipment, essential drugs and medical supplies [23].

Following overthrow of the first Ghanaian president and his socialist government in 1966, a committee was appointed to investigate the health needs of Ghana which, among others, recommended not only the increment of hospital fees but also the strict enforcement of their collection. In view of this, a statutory dispensing fee was introduced in 1966 which was later withdrawn due to public protest [23].

After Ghana returned to democratic rule in 1969, the Hospital Fee Act of 1971 was introduced in government health facilities following recommendations for withdrawal of free outpatient treatment including antenatal care. The aim was to reduce excessive demand and contribute to cost recovery of curative services. Waddington et al. [26] however indicated these imposed charges were low and covered only a minimal percentage of the cost.

Return of military rule in 1972 maintained hospital fees and made moderate budgetary allocation to the health sector. Subsequent democratic and military governments implemented surcharges on imported drugs, hospital equipment and increased fees for hospital services in the early 1980s. From the mid-1980s onwards, the Breton Wood institutions introduced the Structural Adjustment Programme (SAP) because of deterioration in public institutions. This necessitated participation of health service consumers in healthcare financing. Thus, user fees and full cost recovery in public health facilities was introduced in 1985. Under this financing mechanism, payments were initially for replacement of drugs but later became “cash and carry” by the Hospital Fee Law (Legislative Instrument 1313). The user fee was meant to increase revenue and discourage waste of scarce health resources [23,27]. Proponents of user fees argued equity and efficiency gains can be achieved through implementation of a cost-recovery policy package. Within this package, user fees were complemented by mechanisms that favoured low income groups including exemptions.

However, attempts to recover government healthcare expenses through user fees yielded less revenue than expected. Ineffective institutional controls in health facilities resulted in abuse of the system through illegal charges and other unprofessional practices [23]. Another disadvantage of the user fees was financial inaccessibility to healthcare by the poor. This resulted in low utilization of healthcare, rampant self-medication and other unsafe treatment options [23,28].

In the light of Ghana’s chequered health financing history towards a sustainable health financing mechanism, propositions intensified for social health insurance as a remedy to government’s health financing problems. Consequently, a national health insurance scheme (NHIS) was seen as an attractive alternative that meets the country’s 1992 constitutional provision for fundamental human right to basic healthcare. The NHIS was also seen as a vital recipe for attaining the United Nations (UN) Millennium Development Goals (MDGs) [29].

**The NHIS as a health financing mechanism**

The NHIS concept was first piloted in four (4) districts in 1997 which culminated to its introduction in 2003 through parliamentary Act 650 and Legislative Instrument (LI) 1809. This was meant to reduce catastrophic expenditure on health, promote universal access to quality basic healthcare and improve health outcomes for people resident in Ghana [21,23]. Under the NHIS amended Act 852 (2012), every Ghanaian is mandated to enrol in a health insurance scheme. However, due to a relatively large informal sector and weak administrative capability, compulsory registration with an insurance scheme remains a major challenge [21].

The NHIS is financed through central National Health Insurance Fund (NHIF) which is sourced from the National Health Insurance Levy (NHIL) of 2.5% tax on selected goods and services; 2.5% of Social Security and National Insurance Trust (SSNIT) contributions, largely by formal sector workers; payments of premiums, and donor funds [30]. Individuals who are employed in the formal sector and contribute to SSNIT are exempted from premium payment. As at 2012, over 70% of the NHIS financial inflows came from the NHIL; 17.4% from SSNIT contributions and 4.5% from premium payments. Other sources of funding to the NHIF include money allocated by parliament of Ghana, grants, donations, gifts/voluntary contributions, and interests accrued from investments [30].

Over 90% of the disease burden of Ghanaians is covered in the NHIS benefits package including medical emergencies and free maternal care. Moreover, more than 60% of active members of the scheme are under the premium exemption category (i.e. people under 18 years or 70+ years; pregnant women and indigents) though these groups are prone to utilize more health services [21]. Critics of the Ghanaian NHIS have argued that the scheme is overly generous and financially...
unsustainable because of the huge percentage of NHIS membership under premium exemption without co-payment coupled with increasing cost of medical logistics/supplies and health service delivery.

**Government expenditure on health**

Health expenditure in Ghana increased in nominal terms from GHC 2.709 million (approximately 0.77 billion USD) in 2013 to GHC 2.866 million (approximately 0.82 billion USD) in 2014. About 11% of the total GoG expenditure on health including sector budget support was on goods and services, 87% was spent on staff compensation/salaries and 2% spent on assets [13]. Even though Ghana is yet to meet the Abuja target of 15% budgetary allocation to health, the country has improved over the years from 6.1% in 2009 to 10.6% in 2014 (see Figure 3).

There are currently four primary sources of funding to the health sector in Ghana namely: out-of-pocket payments (fee-for-service), Government of Ghana (GoG) through tax revenue, private and public insurance schemes and donor support [13]. Besides these major sources, a number of local and international agents provide funding support to the health sector at varying degrees and interests. These financial outlets include bilateralists, multilateralists and the global funds like President’s Emergency Plan for AIDS Relief (PEPFAR), World Bank and the Gates Foundation. The funding supports from these development partners are either budget support, sector support or project support [13].

Figure 3: Annual government of Ghana budget allocation for health by various sources; Source: Ministry of Health Wholistic Assessment of the Health Sector Report, 2014

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**THE WOTRO-COHEiSION GHANA PROJECT**

The WOTRO-COHEiSION project was initiated in 2011 in two coastal regions in Ghana (Greater Accra and Western). The project was a collaboration between local partners in Ghana including Noguchi Memorial Institute for Medical Research, University of Ghana Legon; Ghana Health Service; National Health Insurance Authority; Christian Health Association of Ghana, and Society of Private Medical and Dental Practitioners. Other collaborators in the Netherlands were the Amsterdam Institute for Global Health and Development (AIGHD) of the University of Amsterdam, University of Groningen and Vrije University of Amsterdam.

Financial support was provided by The Netherlands government through the Ministry of Foreign Affairs and the Science for Global Development (WOTRO). WOTRO is a division of the Netherlands Organisation for Scientific Research (NWO), under the Global Health Policy and Systems Research (GPHPSR) programme (Project no. W07.45.104.00).

This project was motivated by the stagnating (re)enrolment rates in Ghana’s NHIS ten years after its implementation. The project aimed at identifying barriers to client enrolment and retention in the NHIS and explore client-centred strategies to improve quality healthcare and insurance services and increase trust in the NHIS to promote its sustainability.

The WOTRO-COHEiSION project composed of four studies that are interrelated. Three of the studies were investigated by three PhD students on the project and the last component was investigated by a post-doc. These four studies represent different perspectives, those of the client (C), health provider (P), health insurer (I) and policy. The client component was explored largely from the medical anthropological dimension while the provider component was investigated from the biomedical or medical technical perspectives. The insurer sub-study was examined from the health economics perspective. The policy study component provided policy advice to stakeholders based on empirical findings of the client, provider and insurer studies. Figure 4 shows tripod of the Client-Provider-Insurer (CPI) conceptual framework.

Figure 4. Conceptual framework; Source: Conceptualized by author (2016)
AIM OF THE THESIS
The aim of this thesis was first of all to explore the technical and perceived quality healthcare situation in NHIS-accredited health facilities and ascertain the work conditions that motivate or constrain health staff to provide quality healthcare services. Subsequently, the thesis sought to determine whether or not systematic engagement of community members in healthcare quality assessment could enhance client-perceived quality healthcare and staff efforts towards patient safety and risk reduction.

Effect of community engagement on health staff motivation levels and perspectives on the NHIS was also examined, mostly through a parallel PhD project. Based on the impact evaluation of interventions, recommendations were made for policy consideration. Design and implementation of systematic community engagement interventions as reported in this thesis presents an opportunity for health policy makers and public health practitioners to explore the prospects of complementing mainstream quality improvement strategies with community engagement in healthcare quality assessment.

Novelty of this thesis emanates largely from the CPI conceptual framework which triangulates perspectives of clients, healthcare providers and health insurance managers. The CPI approach was aimed at a comprehensive exploration of barriers to (re)enrolment in the NHIS and utilization of healthcare services in NHIS-accredited health facilities. The key objectives of this thesis, pursued in scientific papers were:
1. Ascertain the association between health worker motivation and healthcare quality efforts in Ghana.
2. Determine the relationship between technical quality and perceived quality healthcare.
3. Explore the efficiency levels of NHIS-accredited primary health facilities.
4. Ascertain the impact of community engagement interventions on staff efforts towards patient safety and risk reduction.
5. Find out the impact of community engagement interventions on health staff motivation levels and experiences with clients.
6. Determine whether or not systematic community engagement interventions influence health workers’ views on the NHIS.

STUDY SETTING/POPULATION
The study population was clinics and health centres accredited by the NHIA and owned by government (public) or private individuals/organisations in the Greater Accra and Western regions of Ghana. Greater Accra and Western regions were purposively selected for rural-urban balance since the former is largely urbanized and the latter predominantly rural. Also, at the time this study was conducted, there were no known NHIS interventions ongoing in these regions which was a major selection criterion. Moreover, these two regions do not share a common geographical boundary needed to avoid possible spill-over effects of interventions. Finally, the Greater Accra and Western regions recorded lower NHIS active membership of 25.6% and 32.2% respectively as a percentage of regional population in 2011 [31]. These conditions are some key justifications for selection of the two regions.

Households located around the catchment area of the sampled health facilities (within 10 km radius) were listed, enumerated and randomly sampled. At the health facility level, clinical and non-clinical staff with a minimum of six (6) months working experience were randomly sampled and interviewed. Nearly 2,000 households and over 9,000 household members were interviewed during the baseline and follow-up surveys. Over 300 health staff were interviewed and 128 rapid patient risk assessments and situational analyses conducted in all 64 health facilities.

RESEARCH DESIGN
The study is a four-year Randomized Controlled Trial (RCT) implemented from 2011 to 2015. The data collection process was in three phases namely baseline survey, design and implementation of interventions and follow-up survey.

The baseline survey conducted in 2012 explored health staff’s experiences with clients in the service delivery process, staff views on the NHIS and its effects on quality healthcare delivery, and staff-perceived workplace motivation factors. Based on findings of the baseline surveys and series of stakeholder workshops, Systematic Community Engagement (SCE) interventions were designed and implemented in 2013 in 32 out of 64 health facilities for nearly 12 months (see Figures 5 & 6).

After implementation of the SCE interventions, follow-up surveys were conducted in 2014 to evaluate effect of the interventions and provide policy recommendations to relevant stakeholders. National, regional and district level policy dialogues were organised in 2015 to disseminate the project findings to key stakeholders including Ghana Health Service, National Health Insurance Authority, Ghana’s Parliamentary select committee on health, and the media.

The (“SCE interventions aimed at empowering communities in healthcare quality assessment as a strategy to promote client trust and confidence in healthcare providers and the National Health Insurance Scheme (NHIS). The assumption was that active community engagement in service quality assessment could help decrease perceived barriers to utilizing healthcare and insurance services and ultimately enhance active participation in the NHIS. Objectives of the SCE interventions include:
1. Diminish barriers to participation in the NHIS and utilizing healthcare services
2. Increase client/community participation in healthcare quality assessment
3. Reduce communication gaps between clients, healthcare providers and insurance authorities through effective information dissemination
4. Increase and sustain provider accountability to clients/communities
5. Improve insurance authorities’ accountability to healthcare providers and vice-versa
6. Empower clients and promote client-centred healthcare and health insurance system in Ghana”)

1 The sections in brackets and were quoted from a published article by the author (Alhassan et al. Health Economics Review (2016) 6:49 pages 2 & 3).
The (“SCE interventions are potentially sustainable for resource poor countries such as Ghana because existing local community structures and resources were harnessed for the engagement activities”\(^2\)), thus reducing cost and promoting ownership by community members. Active involvement of key stakeholders such as the Ghana Health Service, National Health Insurance Authority and the district assemblies also promotes sustainability of the SCE interventions.

**Figure 5:** Map of Ghana showing the study districts and health facilities in the Greater Accra Region

### OUTLINE OF THE THESIS

This thesis is organised in two main parts. Part one comprises baseline studies on health worker motivation, healthcare quality and efficiency in health service delivery. Part two reports on post intervention studies. The final part of the thesis is a general discussion based on the baseline and post intervention findings. Below is the outline of the thesis indicating the two parts and various chapters:

**Part I: Baseline studies:**

This part reports on findings from baseline surveys conducted among 324 health workers and 1,903 households. Baseline surveys explored the following thematic areas: health worker motivation levels and associations with healthcare quality efforts (Chapter 2), and comparison of perceived and technical quality healthcare (Chapter 3). Moreover, data envelopment analysis (DEA) was performed to determine efficiency levels of sampled clinics based on available material/human resources and service output/ utilization (Chapter 4).

**Part II: Post intervention studies:** In Part II, impact evaluation was conducted to determine effect of the SCE interventions on: patient safety and risk reduction efforts (Chapter 5); health worker motivation and experience with clients (Chapter 6); views of health workers on the NHIS and its impact on quality service delivery (Chapter 7).

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\(^2\) This section was also quoted from Alhassan et al. Health Economics Review (2016) 6:49; page 3.
REFERENCES


4. Ofosu N. National Health Insurance Scheme in Ghana, Update on Developments, National Health Insurance Authority. Workshop presentation in Amsterdam, Netherland, 2014.


PART 1

Baseline studies
Association between health worker motivation and healthcare quality efforts in Ghana

Robert Kaba Alhassan, Nicole Spieker, Paul van Ostenberg, Alice Ogink, Edward Nketiah-Amponsah, and Tobias F Rinke de Wit

BMC Human Resources for Health 2013, 11(37):1-11
ABSTRACT

Background
Ghana is one of the sub-Saharan African countries making significant progress towards universal access to quality healthcare. However, it remains a challenge to attain the 2015 targets for the health-related Millennium Development Goals (MDGs) partly due to health sector human resource challenges including low staff motivation.

Purpose
This paper addresses indicators of health worker motivation and assesses associations with quality healthcare and patient safety in Ghana. The aim is to identify interventions at the health worker level that contribute to quality improvement in healthcare facilities.

Methods
The study is a baseline survey of health workers (n = 324) in 64 primary healthcare facilities in two regions in Ghana. Data collection involved quality healthcare assessment using the SafeCare Essentials tool, the National Health Insurance Authority (NHIA) accreditation data, and structured staff interviews on workplace motivating factors. The Spearman correlation test was conducted to test the hypothesis that the level of health worker motivation is associated with level of effort by primary healthcare facilities to improve quality healthcare and patient safety.

Results
The quality healthcare situation in health facilities was generally low, as determined by the SafeCare Essentials tool and NHIA data. The majority of facilities assessed did not have documented evidence of processes for continuous quality improvement and patients' safety. Overall, staff motivation appeared low although workers in private facilities perceived better working conditions than workers in public facilities (P < 0.05). Significant positive associations were found between staff satisfaction levels with working conditions and the clinic's effort towards quality improvement and patient safety (P < 0.05).

Conclusion
As part of efforts towards attainment of the health-related MDGs in Ghana, more comprehensive staff motivation interventions should be integrated into quality improvement strategies especially in government-owned healthcare facilities where working conditions are perceived to be the worst.

BACKGROUND
Universal access to good quality healthcare and optimal patient safety is the goal of health systems and governments all over the world. Even though developed countries have made significant achievements towards attainment of this goal, many developing countries in Africa lag behind due to financial, material, and human resource constraints.

Of the estimated global health workforce of 59.2 million, 3% are found in Africa coping with 25% of the global disease burden. It is estimated that the health sector workforce density per 1000 population in Africa is 2.3 compared to 24.8 in the Americas [1].

Ghana is one of the sub-Saharan African countries making considerable progress in many health outcome indicators. For instance, the percentage of antenatal and postnatal coverage improved from 42.2% and 33.8% in 2008 to 91.3% and 64.7% in 2011, respectively [2]. The percentage of deliveries attended by skilled health workers also increased from 44.2% in 2008 to 52.3% in 2011. Likewise, the number of outpatient visits per capita improved from 0.77 in 2008 to 1.07 in 2011.

However, these achievements are insufficient to attain the 2015 targets for the health-related Millennium Development Goals (MDGs) [3]. This is due to a number of factors, including understaffing in health facilities, inequitable distribution of health sector human resources, demotivated staff and inadequate healthcare infrastructure [3,4]. To attain these health-related MDGs, there is the need for more comprehensive quality improvement interventions including a health sector human resource (HSHR) approach.

An estimated 52,258 people are formally working in the health sector in Ghana, of which 61.5% are employed in the public sector serving more than 24 million people [5]. Of the formal sector workers, 56% are non-clinical staff while 44% are clinical staff. There are also 21,791 people registered as engaged in traditional medicine and 367 registered traditional birth attendants (TBAs) [5].

Even though doctor-patient and nurse-patient ratios have progressively improved over the years, rural-urban inequities still exist, with substantially more unfavourable ratios in the rural areas. The doctor-patient ratio in 2006 was 1:14,733 but improved to 1:10,034 in 2011. Likewise, nurse-patient ratio improved from 1:1537 in 2006 to 1:1240 in 2011 [2]. Two major teaching hospitals in urban Ghana employ more than 45% of the country's medical doctors. Fewer than 15% of medical doctors work in the district and sub-district health facilities. In total, an estimated 68% of the health workforce works in urban areas and 32% in the rural areas where more than 50% of the Ghanaian population lives [5].

Governance and professional regulation of health sector human resources in Ghana is within the domain of the Human Resources for Health Development Directorate (HRHDD) under the Ministry of Health (MOH). Professional bodies such as the medical and dental council, nurses and midwives council, and the pharmacy council are government institutions mandated to ensure professional competence and discipline of members during and after training.
Among the key functions of the HRHDD are: policy strategy; planning and distribution of health staff; coordination of pre-service training with relevant training institutions; development of staff training functions; and monitoring and evaluation.

The setting of this study was in the Greater Accra (GAR) and Western (WR) regions of Ghana. The GAR is predominantly urbanized and cosmopolitan with close to 4 million people and 288 National Health Insurance Authority (NHIA) accredited healthcare facilities. The region has an estimated 4209 nurses, 1186 midwives and 1107 doctors. This represents 31%, 33% and 64% of Ghana’s total population of nurses, midwives and doctors, respectively [5]. The GAR is the national capital of Ghana and has 10 administrative districts.

The WR is predominantly rural with a population of a little over 2 million people and 292 NHIA accredited healthcare facilities. The region has an estimated 1484 nurses, 380 midwives and 124 doctors, representing 10.8%, 10.6% and 7.1% of the country’s total population of nurses, midwives and doctors, respectively [5]. The WR has 17 administrative districts.

This study is necessitated by the relatively minimal attention given to boosting staff motivation as a quality improvement strategy. Until recently, health worker motivation as a healthcare quality improvement strategy was not emphasized in health sector reforms in most countries [6,7]. Nonetheless, HSHR is an important input in quality healthcare delivery and the pillar of every health system [1,8,9].

In addition, low staff motivation can be a major contributing factor to poor service quality in healthcare facilities and will likely be associated with staff impatience to clients, absenteeism, long waiting times, informal fee charges and increased labour strike actions [1,4,10,11].

The current paper is aimed at exploring the quality healthcare and patient safety situation in healthcare facilities accredited by the Ghanaian NHIA (government regulatory body) and identify associations with staff motivation. This would contribute to identifying priority areas of interventions at the health worker level to improve safety and quality healthcare for clients and contribute to increased willingness to (re-)enrol in the national health insurance scheme (NHIS).

According to Ghana’s NHIS law (Act 650), health care facilities willing to render services to NHIS insured clients must be accredited by the NHIA for five years on the first account, subsequently renewable every two years. Depending on facility performance during on-site assessment and inspection, an accreditation outcome can be full, selective, provisional or denied. Full accreditation is granted when a facility attains a total mean percentage assessment score of at least 50% which is equivalent to grade D.

Respondents were asked to rank their level of satisfaction with 19 workplace motivating factors on a four-point Likert scale from 1 = “very disappointing” to 4 = “very satisfactory”. Additional questions were asked on workers’ socio-demographic characteristics, financial responsibilities, financial status and additional sources of income besides regular employment income.

Apart from the structured questionnaire for staff, the NHIA accreditation data1 and the ESS patient risk assessment data2 were used to ascertain the quality healthcare situation in the sampled facilities.

This study supplemented the NHIA data with the SafeCare Essentials (ESS) patient risk assessment tool because the former does not emphasize staff behaviour, attitudes and efforts toward quality healthcare and patient risk reduction which is the main focus of this study. Moreover, at the time of conducting this study the researchers did not have access to up-to-date disaggregated NHIA accreditation scores on the sampled 64 facilities. In view of this, aggregate NHIS scores in five core areas were analysed alongside scores of the ESS tool.

To control for bias during administration of the ESS tool, scoring was done by three trained research assistants who agreed on final scores for every facility after independent scoring. As part of the assessment process, clinic administrative records were reviewed alongside observations and key informants’ interviews. The semi-structured staff questionnaires and ESS tool were piloted in two conveniently sampled clinics in the GAR. The piloting allowed for correction of typographical mistakes and conversance with the interview process.

**Sampling procedures**

The GAR and WR were purposively sampled for rural-urban balance and to avoid spill-over effects during implementation of interventions, since both regions do not share a common boundary. In each region, eight districts were randomly sampled using Principal Component Analysis (PCA) [12]. At the health facility level, PCA was used to generate scores for NHIS accredited primary healthcare facilities in the GAR and WR. Using the quota sampling system, each selected district in a region was allocated a maximum of four qualified health facilities. Per this criterion, 32 public and private facilities were randomly sampled from each region to make a total of 64.

The sampled 64 facilities represent a little more than 2% of the total number of accredited facilities (n = 2647) in Ghana as of 2010. The 32 facilities from each region represent 11% of the total number of accredited facilities in GAR (n = 288) and WR (n = 292).

At the staff level, clinical and non-clinical health workers were interviewed from all 64 facilities. Inclusion criteria were full time employment and at least six months work experience to elicit responses from staff who are more experienced and better informed about their work environment. To avoid professional skewing in responses and ensure reliability, at most one respondent from each professional category was randomly sampled and interviewed in the selected health facilities.

**Study design and data collection**

This study comprises a baseline longitudinal survey of staff motivation aspects as well as staff efforts in patient risk reduction and quality healthcare improvement using semi-quantitative data collection techniques. Structured questionnaires were developed on staff workplace motivational factors based on preceding in-depth interviews with health workers.
Ethical considerations

Ethical clearance for the surveys was obtained from the Ghana Health Service (GHS) Ethical Review Board (ERB) (clearance number: GHS-ERC: 18/5/11). Informed consent was obtained from health facility heads, the district and regional health directorates and individual respondents.

Statistical analysis

All data sets were analysed with Stata statistical software (version 12.0) after data cleaning and coding to anonymize facilities and staff. To ensure internal validity, all questions were informed by research objectives and reviewed literature. Cronbach’s alpha (α) was conducted to check for scale reliability of the 19 Likert scale items on workplace motivating factors and found to be 0.82, which is above the 0.70 rule of thumb [13,14]. Moreover, different cadres of health professionals were interviewed to ensure external validity of the findings. Parametric and non-parametric tests were used in the data analysis and hypothesis testing. Factor analysis was first conducted with orthogonal varimax rotation (Kaiser off) to group the 19 workplace motivational factors into 4 major factors [12].

Based on Bennett and Franco’s [7] conceptual framework, these four factors were predicted and named as follows: (1) clinic physical work environment (clinic physical environment, attitude of superiors, attitude of colleague workers and workload in clinic); (2) resource and drugs availability (availability of adequate modern equipment, availability of consumables/logistics, number of clinic staff, water supply, electricity supply and availability of drugs for patients); (3) financial and extrinsic incentives (monthly salary, payment of financial incentives, reputation and recognition from job, accommodation for staff, transportation, allowance for staff, client responsiveness to staff instructions and shuttle transport for staff); and (4) job prospects and career development (possibility for promotion and opportunity for further education).

Following the factor analysis, Spearman’s ranked order correlation test was conducted to ascertain the association between the clinic’s level of effort towards quality healthcare and staff motivation levels in the four factor-analysed staff motivational markers. This statistical analysis also tested the hypothesis that level of health worker motivation is associated with level of effort by primary healthcare facilities to improve quality healthcare and patient safety.

RESULTS

Characteristics of health workers

A total of 333 questionnaires were administered to health workers in 64 clinics, of which 324 were correctly completed and returned, representing a 97% return rate. Of the workers interviewed, 56% were from rural facilities, 44% were from urban facilities, 57% worked in private facilities and 43% worked in public facilities. The majority of the respondents were female (67%) and the mean age was 39 years (SD = 14, 95% CI = 37-40). Most of the workers had tertiary (46%) and secondary education (34%). The majority of respondents (272; 84%) were clinical staff, mostly not married (57%) and Christians (96%).

Staff 40-years-old or younger were within the lower monthly salary bracket than other age groups (P <0.001). Likewise, workers with at least tertiary education received higher salaries than those with secondary education (P <0.001). Clinical staff and unmarried staff were in the higher income bracket than non-clinical and married workers (P <0.001) (See Table 1).

Staff experiences and level of motivation by work conditions

To ascertain the conditions under which health workers perform their duties and how these conditions either constrain or motivate them to deliver good quality healthcare, respondents were asked questions related to their mode of transport to work, working hours, workload and monthly salaries. The dominant mode of transport to work on a daily basis was walking (46%) followed by public transport (37%) and use of personal car (12%). More than half (52%) of the respondents indicated that they regularly report to work late. Of this number, 78% of them do so once a week; 22% report to work late twice or more times a week.

Results on the financial status and responsibilities of health workers showed that 55% of the staff interviewed earned less than GHC 500 as a monthly salary; 46% earned between GHC 500 and GHC 1000; 4% earned more than GHC 1300. Only 84% of the respondents indicated that they regularly report to work late. Of this number, 78% of them do so once a week; 22% report to work late twice or more times a week.

An independent t-test was conducted to test for differences in mean scores on rated satisfaction with the factor-analysed working conditions. It was found that workers in private health facilities were more motivated by the physical work environment of their clinics (mean score = 3.2) than those in public facilities (mean = 2.3), P <0.001. In addition, health workers in private facilities expressed better satisfaction with availability of drugs and other medical resources (mean = 3.1) than those in public facilities (mean = 2.8), P <0.05.

Even though overall satisfaction with financial and extrinsic incentives was low in all the 64 facilities, staff in public health facilities expressed greater dissatisfaction (mean = 1.9) than their counterparts in private facilities (mean = 2.2). In addition, workers in urban facilities said they were more satisfied with drug and resource availability in their facilities than workers in rural facilities (P <0.05) (See Table 3).
Table 1: Characteristics of health workers (n = 324)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Public</th>
<th>Rural</th>
<th>&lt;GHC 500</th>
<th>&gt;GHC 1300</th>
<th>P-value</th>
</tr>
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<tr>
<td>Private</td>
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<td>90(28)</td>
<td>60(25)</td>
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<td>65(20)</td>
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<td>Rural</td>
<td>111(34)</td>
<td>70(21)</td>
<td>35(11)</td>
<td>84(25)</td>
<td>27(8)</td>
<td>0.001</td>
</tr>
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<td>Urban</td>
<td>213(66)</td>
<td>49(15)</td>
<td>123(38)</td>
<td>146(43)</td>
<td>67(21)</td>
<td>0.000</td>
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<td></td>
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<td></td>
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<td>77(28)</td>
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<tr>
<td>&lt;40 years</td>
<td>111(34)</td>
<td>70(21)</td>
<td>35(11)</td>
<td>84(25)</td>
<td>27(8)</td>
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<td>41-60 years</td>
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<td>49(15)</td>
<td>31(10)</td>
<td>64(20)</td>
<td>48(14)</td>
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<td>≥61 years</td>
<td>30(9)</td>
<td>10(3)</td>
<td>10(3)</td>
<td>14(4)</td>
<td>26(8)</td>
<td>0.015</td>
</tr>
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<td>65(20)</td>
<td>77(28)</td>
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<td>14(4)</td>
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<td></td>
<td></td>
<td></td>
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<td>Married</td>
<td>74(23)</td>
<td>61(19)</td>
<td>13(4)</td>
<td>71(22)</td>
<td>30(10)</td>
<td>0.000</td>
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<td>83(25)</td>
<td>57(18)</td>
<td>156(47)</td>
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<td>0.000</td>
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<td>46(14)</td>
<td>136(42)</td>
<td>43(13)</td>
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<td>Other</td>
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<td>52(16)</td>
<td>51(16)</td>
<td>109(34)</td>
<td>46(14)</td>
<td>0.000</td>
</tr>
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</table>

Note: Statistically significant at 0.05 level of significance. Source: COHESSION Project Clinic Staff Interviews Data (March-June, 2012). GHC, Ghana cedi.

Table 2: Staff experiences with work conditions, transportation to work and affiliation with professional associations

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Obs.</th>
<th>Frequency (%)</th>
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<tr>
<td>Regular mode of transport to work</td>
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<tr>
<td>Walk</td>
<td>149</td>
<td>46</td>
</tr>
<tr>
<td>Bicycle</td>
<td>4</td>
<td>1</td>
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<tr>
<td>Motor cycle</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Public transport</td>
<td>52(16)</td>
<td>24(9)</td>
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<td>Personal car</td>
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<td>12</td>
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<tr>
<td>Missing system</td>
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<td>1</td>
</tr>
<tr>
<td>Occasional tardiness to work</td>
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<td>Yes</td>
<td>128</td>
<td>78</td>
</tr>
<tr>
<td>No</td>
<td>155</td>
<td>48</td>
</tr>
<tr>
<td>Number of times staff reports to work late a week</td>
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<tr>
<td>Yes</td>
<td>165</td>
<td>52</td>
</tr>
<tr>
<td>No</td>
<td>155</td>
<td>48</td>
</tr>
<tr>
<td>Range of monthly salary received from clinic</td>
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<td>&lt;GHC 500</td>
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<td>55</td>
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<tr>
<td>GHC 500-GHC 1300</td>
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<td>1</td>
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<tr>
<td>Work allowance received from clinic outside monthly salary</td>
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<td>Membership in formal professional association</td>
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<tr>
<td>No</td>
<td>101</td>
<td>42</td>
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<td>Just a member</td>
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<td>Patron</td>
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<td>1</td>
</tr>
<tr>
<td>Treasurer</td>
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<td>3</td>
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<tr>
<td>Membership in professional association influence professional practice</td>
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<tr>
<td>Yes</td>
<td>110</td>
<td>58</td>
</tr>
<tr>
<td>No</td>
<td>81</td>
<td>42</td>
</tr>
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</table>

Source: COHESSION Project Clinic Staff Interviews Data (March-June, 2012). Obs., Number of observations.
Table 3: Differences in staff satisfaction with four aggregate markers of staff motivation

<table>
<thead>
<tr>
<th>Aggregated motivating factors</th>
<th>Facility ownership</th>
<th>Geographic Location</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Private Mean (SD)</td>
<td>Public Mean (SD)</td>
</tr>
<tr>
<td>Physical work environment</td>
<td>3.2(0.47)</td>
<td>2.3(0.51)</td>
</tr>
<tr>
<td>Availability of resources and drugs</td>
<td>3.1(0.75)</td>
<td>2.8(0.77)</td>
</tr>
<tr>
<td>Financial and extrinsic incentives</td>
<td>2.2(0.64)</td>
<td>1.9(0.55)</td>
</tr>
<tr>
<td>Job prospects and career development</td>
<td>2.4(0.86)</td>
<td>2.5(0.80)</td>
</tr>
</tbody>
</table>

*Statistically significant at 0.05 level of significance. Source: COHEISION Project Clinic Staff Interviews Data (March-June, 2012)

Quality healthcare situation in sampled health facilities

Analysis of the NHIA accreditation data showed that among the five core standard areas, safety and quality management was the area where most facilities performed worst (mean percentage score = 53%). Performance was however better in: range of services, organisation and management, and staffing and service delivery. Details of the mean percentage scores of the 64 facilities in the five core standard areas are shown in Figure 1.

Apart from the NHIA accreditation data on the quality situation of the surveyed facilities, the Essentials patient risk assessment tool was used to ascertain the levels of effort of these health facilities towards risk reduction and safety. Results of the assessment showed that overall performance of the facilities was low with none of the risk areas attaining a mean percentage score up to 50%. Quality improvement and patient safety was the area with the lowest score (mean percentage score = 22%) followed by leadership processes and accountability (mean percentage = 28%). Clinical care of patients and competency of workforce were areas with better mean percentage scores of 48% and 42% respectively (See Figure 2).

Association between staff motivation and quality healthcare in health facilities

Spearman’s rank order correlation test was conducted using the four aggregate markers of staff motivation and quality healthcare standards according to the ESS and NHIA tools to ascertain the association between staff motivation levels and quality healthcare in health facilities.

The results showed a positive correlation between staff motivation levels and clinics’ efforts towards quality improvement and patient safety (See Table 4). Most of the quality healthcare indicators according to the ESS tool positively correlated with the four aggregate staff motivation factors (P <0.05). The NHIA quality healthcare standard areas were positively correlated with staff satisfaction level with financial incentives and job prospects (P <0.05) (See Table 4).

Overall, quality healthcare standards in the surveyed facilities using the NHIA and ESS tools showed a significant positive correlation with most of the staff motivation markers (P <0.05) (See Table 4). Thus, as staff motivation levels improve in these motivational factors, efforts towards quality improvement and patient safety will likely improve and vice versa.
Chapter 2

Interviews Data (March-June, 2012)

Even though these staff motivation interventions are appropriated towards improving development courses [17].

Several interventions have been implemented to improve the situation including motivating concerns of health managers, policy makers, patients and civil society [15,16]. Over the years, Quality healthcare and patient safety in Ghana’s healthcare facilities have been longstanding DISCUSSION

<table>
<thead>
<tr>
<th>ESS and NHIA Quality healthcare Markers</th>
<th>Motivating factor 1</th>
<th>Motivating factor 2</th>
<th>Motivating factor 3</th>
<th>Motivating factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership and accountability</td>
<td>0.2702*</td>
<td>0.3013*</td>
<td>0.2538*</td>
<td>0.0896</td>
</tr>
<tr>
<td>Competency of workforce</td>
<td>0.1616*</td>
<td>0.1258*</td>
<td>0.2411*</td>
<td>0.1788*</td>
</tr>
<tr>
<td>Environmental safety</td>
<td>0.1086</td>
<td>0.1306*</td>
<td>0.1600*</td>
<td>0.0452</td>
</tr>
<tr>
<td>Clinical care</td>
<td>0.2621*</td>
<td>0.2273*</td>
<td>0.2918*</td>
<td>0.1526*</td>
</tr>
<tr>
<td>Quality improvement</td>
<td>0.1776*</td>
<td>0.2387*</td>
<td>0.2952*</td>
<td>0.2463*</td>
</tr>
<tr>
<td>Overall quality healthcare</td>
<td>0.2478*</td>
<td>0.2716*</td>
<td>0.2764*</td>
<td>0.1110*</td>
</tr>
</tbody>
</table>

| Range of services                     | -0.1851*            | -0.1731*            | -0.1352*            | -0.0129             |
| Staffing                              | -0.0847*            | -0.1219*            | -0.0099             | 0.0544              |
| Organisation and management           | 0.0289              | -0.1357*            | 0.1057              | 0.0858              |
| Quality and safety management         | 0.0419              | 0.0207              | 0.1475*             | 0.1250*             |
| Care delivery                         | -0.0821             | -0.0299             | 0.0854              | 0.0601              |
| Overall quality healthcare            | -0.0258             | 0.0271              | 0.0760              | 0.1236*             |

*Spearman correlation coefficient statistically significant at 0.05 level of significance. Source: COHESION Project Clinic Staff Interviews Data (March-June, 2012)

DISCUSSION

Quality healthcare and patient safety in Ghana’s healthcare facilities have been longstanding concerns of health managers, policy makers, patients and civil society [15,16]. Over the years, several interventions have been implemented to improve the situation including motivating health workers through incentives, such as provision of staff accommodation, short promotion periods, priority for hired purchased cars, paid annual leave and organisation of professional development courses [17].

Even though these staff motivation interventions are appropriated towards improving working conditions of health workers, especially in deprived areas, their efficacy towards quality health services delivery has been minimal [18,19].

The baseline results of this study generally showed inadequate efforts towards quality improvement and patient safety in the 64 sampled facilities. According to the ESS assessment tool, a significant number of the facilities surveyed had ad hoc and emerging uniform risk-reduction activities in place towards quality improvement. Management processes and clinical activities were largely not documented and consistent. Bruce and Kilian [15] found similar results in a survey of more than 200 Ghanaian health facilities where only 31% of the facilities had quality assurance teams and documented activities for quality improvement.

Results on the quality healthcare situation are representative of the national NHIS accreditation data where of the 2647 accredited facilities, only 81 (3%) were accredited as grade “A+” and “A” facilities. Up to 4% were granted provisional accreditation because of sub-standard quality healthcare [20].

Perceptions of workplace incentives were generally low including monthly salaries and work allowance. Of the respondents, 55% said they received less than GHC 500 as a monthly salary and more than 80% said they did not receive any form of work allowance outside the regular monthly salary.

Even though some literature suggests that the salary situation for health workers has improved and contributed to decreased annual attrition of skilled health workers in Ghana [21], this study found that satisfaction with the monthly salary remains low among health workers. Since secondary data on actual monthly salaries of the cadre of staff interviewed was not accessed, these self-reported salary ranges might have been under reported by respondents as an advocacy for salary increment.

It is also important to mention that the reported low salaries could be attributed to the predominantly low grade cadre of health professionals interviewed in this study. These include nurse-assistants, community health nurses and labourers who are often paid lower salaries and other financial remunerations.

The findings on perceived satisfaction with financial remunerations are critical to understanding and designing financial incentives in the health sector given the important role of financial remuneration in the provision of quality healthcare services.

Financial incentives including the monthly salary are important sources of motivation for workers including health workers. Low salaries of health workers in many African countries, including Ghana, have been cited as a major disincentive for health workers to render good quality healthcare [22] and a push factor for migration [23,24]. Agyepong et al. [4] mentioned low salaries of health workers as a major contributory factor for poor service quality especially in terms of staff attitudes towards patients, informal fee charges and lateness to work. Staff dissatisfaction with working conditions has necessitated engagement in part-time income-generating jobs to supplement regular employment incomes. This practice has been found to have a negative influence on quality service delivery [18].

Even though only 9% of the respondents admitted engaging in part-time work in this study, a significant negative correlation was found between moonlighting and overall efforts towards quality healthcare and patient safety (Coef. = -0.1182, P = 0.0369). The reported low engagement in moonlighting in this study could be attributed to under reporting perhaps because the practice is widely perceived to be illegal.

Workload is an important workplace motivating factor especially in developing countries where health sector human and material resources are limited [1]. This study found that, on average, a clinical staff attends to 52 clients a day. The increased financial accessibility for clients following the implementation of the NHIS has been cited as a major contributory factor for increased utilization of orthodox medical services and, therefore, increased the burden on healthcare staff [2,25]. The reported average of 52 clients per staff a day can be attributed to
In addition, the NHIA accreditation data analysed in this study was collected since 2009 and it is possible that the quality situation in these facilities has changed. Moreover, only aggregate NHIS accreditation data were analysed on 64 accredited primary health facilities because the researchers did not have access to the detailed accreditation results. It is therefore possible that the quality situation as presented in this paper is the broader picture on these selected facilities.

Future researchers should include more complex and non-accredited facilities to ascertain differences in staff motivation and efforts towards quality healthcare based on facility size and accreditation status. The current study involved only NHIS accredited primary healthcare facilities.

Conclusion
Quality healthcare and patient safety standards are generally inadequate in the 64 surveyed primary healthcare facilities. Likewise, staff satisfaction levels with working conditions are low especially in terms of financial incentives and career development prospects. Health workers in private and urban facilities are more motivated by their working conditions than those in public and rural facilities.

It was generally found that staff motivation levels with working conditions positively correlate with quality healthcare and patient safety standards in health facilities, suggesting the need to integrate staff motivation strategies into health facilities quality improvement plans.

Policy recommendations
Based on the results of this baseline survey, the following intervention areas are proposed for policy consideration:

1. Health managers in public health facilities should invest more in health infrastructure and regular supply of drugs since this was a major source of de-motivation for workers in public facilities. Infrastructural investment should be improved in terms of regular supply of water, provision of modern medical equipment and upgrading of facility OPDs and consulting rooms. These infrastructural investments not only motivate health workers but are also important inputs in delivery of good quality health services needed to attain the health related MDGs.

2. Staff motivation markers as identified in this study should be incorporated into revised NHIA accreditation modules and quality improvement plans for health facilities. The current accreditation tool is predominantly process oriented with minimal criteria on staff efforts towards quality improvement and patient safety. Criteria scores on staff level of motivation with intrinsic and extrinsic motivational factors could form part of the accreditation process for health facilities. Facilities with poorly motivated staff could, therefore, be denied full accreditation.

3. Performance-based remuneration systems should be implemented in private and public health facilities to motivate workers based on quarterly (every three months) performance evaluation outcomes. The current yearly performance appraisals for staff in public health facilities in Ghana are done largely for promotions.
Acknowledgement/Funding
This study was conducted with the support of The Netherlands government through the Ministry of Foreign Affairs and the Science for Global Development (WOTRO) which is a division of the Netherlands Organisation for Scientific Research (NWO), under the Global Health Policy and Systems Research (GHPHSR) programme (Project no. W 07.45.104.00). Other collaborators of this project include Noguchi Memorial Institute for Medical Research (NMIMR); University of Ghana Legon; Amsterdam Institute for Global Health and Development (AIGHD), Netherlands; University of Amsterdam (UvA); Vrije University (VU), Amsterdam, Netherlands; University of Groningen, Netherlands; National Health Insurance Authority (NHIA), Ghana; Ministry of Health (MoH)/Ghana Health Service (GHS); Christian Health Association of Ghana (CHAG)

Endnotes
1 The NHIA accreditation is done with an accreditation tool that is organised into 12 broad standard areas of which 5 are considered core areas. The five core areas are: (1) range of services; (2) staffing; (3) organisation and management; (4) safety and quality management; and (5) care delivery. Depending on the level and category of health facilities, relevant standard areas are applied. The NHIA accreditation tool employs criteria scores based on facility performance in applicable standard areas. The NHIA criteria score ranges from 0 – 3, where 3 is scored if all criteria are met; 2 if half or more are met but not all; 1 if less than half are met but not zero; 0 if no criterion is met.
2 The ESS tool is provided by the SafeCare Initiative, a collaboration of the PharmAccess Foundation, the Council for Health Services Accreditation of Southern Africa (COHSASA), and the Joint Commission International (JCI). The ESS tool is designed to identify the capability of a facility to move slowly or more rapidly towards higher levels of clinical quality and safer patient care according to staff efforts. It consists of 5 primary risk areas and 41 criteria related to quality healthcare and patient safety. The tool has been implemented in African countries, such as Kenya, Tanzania, Ghana and Nigeria.

The five ESS primary risk areas are: (1) leadership process and accountability (7 questions); (2) competent and capable staff (7 questions); (3) safe environment for staff and patients (10 questions); (4) clinical care of patients (10 questions); and (5) improvement of quality and safety (7 questions). Quality assessment scoring is done on 4 levels of effort, from 0 – 3. Higher levels depict better efforts towards quality healthcare and patient safety standards by health facility staff.
Zero is scored when the desired quality improvement activity in a clinic is absent or there is mostly ad hoc activity related to risk reduction. One is scored when the structure of more uniform risk-reduction activity begins to emerge in a clinic. Two is scored when there are processes in place for consistent and effective risk-reduction. Three is scored when there are data to confirm successful risk-reduction strategies and continuous improvement.

4 Non-clinical staff are the support staff who do not have direct contact with patients. They include administrators, accountants, labourers and receptionists.
5 US$ 1.0 is equivalent to 2.1 Ghana Cedis (GHC): (XE.com/currency converter, 13/08/2013).
6 SD = Standard deviation. Mean scores and SD are based on a 4 point Likert scale from 1 = very disappointing to 4 = very satisfactory. Higher mean scores SD, therefore, suggest higher staff satisfaction with workplace motivating factors and vice versa.
7 Extrinsic incentives include prestige and societal recognition gotten from the job.
8 Motivating factors: Motivating factor 1 = clinic physical work environment; Motivating factor 2 = availability of resources and drugs; Motivating factor 3 = financial and extrinsic incentives; Motivating factor 4 = job prospects and career development.

Clinical staff includes medical staff who have direct contact with patients. They include medical doctors, nursing personnel, pharmacy personnel, medical assistants and laboratory personnel.
REFERENCES

CHAPTER 3

Comparison of perceived and technical healthcare quality in primary health facilities: implications for a sustainable national health insurance scheme in Ghana

Robert Kaba Alhassan, Stephen Opoku Duku, Wendy Janssens, Edward Nketiah-Amponsah, Nicole Spieker, Paul van Ostenberg, Daniel Kojo Arhinful, Menno Pradhan, and Tobias F. Rinke de Wit

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ABSTRACT

Background
Quality healthcare in health facilities is critical for a sustainable health insurance system because of its influence on clients’ decision to participate in health insurance and utilize health services. Exploration of the different dimensions of healthcare quality and their associations will help determine more effective quality improvement interventions and health insurance sustainability strategies, especially in resource-constrained countries in Africa where universal access to good quality healthcare remains a challenge.

Purpose
To examine the differences in perceptions of clients and health staff on quality healthcare and determine if these perceptions are associated with technical quality proxies in health facilities. Implications of the findings for a sustainable National Health Insurance Scheme (NHIS) in Ghana are also discussed.

Methods
This is a cross-sectional study in two southern regions in Ghana involving 64 primary health facilities; 1,903 households and 324 health staff. Data collection lasted from March to June, 2012. Wilcoxon-Mann-Whitney test was performed to determine differences in client and health staff perceptions of quality healthcare. Spearman’s rank correlation test was used to ascertain associations between perceived and technical quality healthcare proxies in health facilities, and ordered logistic regression employed to predict the determinants of client and staff-perceived quality healthcare.

Results
Negative association was found between technical quality and client-perceived quality healthcare (coef. = -0.0991, P < 0.0001). Significant staff-client perception differences were found in all healthcare quality proxies, suggesting some level of unbalanced commitment to quality improvement and potential information asymmetry between clients and service providers. Overall, the findings suggest increased efforts towards technical quality healthcare alone will not necessarily translate into better client-perceived quality healthcare and willingness to utilize health services in NHIS-accredited health facilities.

Conclusion
There is the need to intensify client education and balanced commitment to technical and perceived quality improvement efforts. This will help enhance client confidence in Ghana’s healthcare system, stimulate active participation in the national health insurance, increase healthcare utilization and ultimately improve public health outcomes.

INTRODUCTION

Low adherence to quality healthcare practices in health facilities remains one of the reasons why many low and middle-income countries (LMICs) in Africa are unable to meet the targets of the health-related Millennium Development Goals (MDGs) [1]. Although quality in healthcare delivery has been examined from different perspectives in the past [2,3,4] it was not until the last two decades that the topic gained prominence as a means to enhance effectiveness and accountability in health systems, especially in Africa [5]. Adherence to quality healthcare practices remains low in many LMICs largely due to financial, logistical and human resource constraints. Moreover, available community resources and potentials are often inadequately harnessed to support central governments’ efforts.

Quality healthcare is often categorized into technical and perceived [2], with the former referring to structured processes and professionally defined practices and protocols of care while the latter focuses on perceptions, experiences and satisfaction with the service delivery processes [2,6]. The Institute of Medicine (IOM) in the United States of America (USA) proposed six attributes of quality healthcare indicating that healthcare should be client-centred, timely, effective, efficient, safe and equitable [7].

Within the Ghanaian context, quality in healthcare has been investigated from different dimensions in recent past [8-11] and continues to draw attention of researchers and the Institutional Care Division (ICD) of the Ghana Health Service (GHS) [12] because of the increasing relevance of quality healthcare in health insurance sustainability and population health outcomes [13]. The introduction of the National Health Insurance Scheme (NHIS) in Ghana barely a decade ago particularly pose substantial challenge to healthcare facilities to maintain acceptable healthcare quality standards. Moreover, empirical evidence of low patient satisfaction with health service quality [8-11] coupled with minimal gains in health outcome indicators have put healthcare quality at the centre of Ghana’s healthcare system.

Many scientific studies on quality healthcare in Ghana either investigate quality healthcare solely from the medical technical or client-perceived perspectives without comparing the two dimensions, particularly in the context of accredited health facilities. For instance, studies by Turkson [11] and Atinga et al [8-10] on quality healthcare in Ghana did not compare perceptions of patients and health staff with patient safety and risk reduction efforts in the pertinent health facilities. Other previous studies on quality healthcare in Ghana [14-16] and some African countries [5,17,18,19] largely focused on client perception/satisfaction variables to “measure” quality healthcare.

While acknowledging the importance of client-perceived quality healthcare in quality improvement plans [17,19,20], it is important to recognize that mainly relying on this quality dimension might not adequately define the whole concept of quality healthcare and should not be used alone as proxy for overall quality, safety and effectiveness of a healthcare system [21]. Likewise, relying mainly on technical quality assessment outcomes without taking into account the experiences and views of clients might not enhance quality from the perspective of clients which is needed to increase health service utilization and health insurance uptake and
Even though there are limitations associated with using client satisfaction surveys to “measure” quality healthcare, adequate triangulation of perceived and technical quality assessment methods could prove useful in determination of quality healthcare situations in healthcare facilities. For instance, there are objectivity and reliability concerns when researchers exclusively depend on client perceptions to ascertain quality of healthcare in health facilities because of potential client intimidation arising from interviews conducted within health facility environs [5,6,21,22]. The tendency for clients to respond favourably to questions on quality healthcare dimensions could be high but not necessarily reflect their experiences and judgment of the quality situation. Robyn et al. [23] found that even though insured clients in Burkina Faso rated quality healthcare dimensions high, these clients actually received lesser technical quality healthcare in terms of physical examinations and adherence to other standard protocols by health personnel.

Favourable responses by clients in many instances could be attributed to the fact that most clients, especially in rural Africa, have limited knowledge of what constitutes quality healthcare or they simply do not have enough health facility alternatives to compare quality standards. In addition, perceptions of clients on quality healthcare are often influenced by attributes such as gender, age, cultural orientation, religion, geographic location (rural or urban) and income levels [5,6,8-11,15]. These attributes if not appropriately adjusted for could skew responses and possibly misinform researchers’ conclusions. In view of these limitations, a comparison of client/staff-perceived quality healthcare with technical quality proxies (also referred to as patient safety and risk status in this paper) could offer a better understanding of the quality situation in pertinent healthcare facilities.

This study is motivated by the existing limitations in the literature especially on Ghana where the introduction of the National Health Insurance Scheme (NHIS) and its accreditation system has increased the need for a multi-faceted approach to healthcare quality improvement, especially in accredited primary health facilities which constitute over 70% of the 3,575 health facilities accredited by the NHIA as at 2012. Understanding views of clients and health providers on quality healthcare and comparing these views with the technical quality healthcare situation in the particular health facilities will offer policy makers and health managers the opportunity to address existing gaps in the service delivery process and promote client trust in the healthcare system and the NHIS. Applying triangulated approaches in investigating healthcare quality, as demonstrated in Dalinjong and Laar [13], De Man et al. [24], Borgermans et al. [25], Ackermann et al. [26] and Drain [27], will help health managers to do adequate introspection and at the same time understand clients’ expectations which are needed to design appropriate client-centred healthcare quality improvement interventions.

This paper sought to ascertain the perceptions of clients and health staff on quality healthcare services in accredited primary health facilities and how these perceptions correlate with patient safety and risk status (technical quality) in these facilities. The expectation is that a comprehensive exploration of healthcare quality will help attain healthcare systems that are client-centred yet timely, effective, efficient, safe and equitable in resource poor settings in Africa.

The following research questions are addressed in the paper: (i) Are there differences in perceptions of clients and health staff on quality health service delivery in accredited health facilities? If so what are these differences? (ii) Do client and provider perceptions of service quality correlate with an objective assessment of patient safety and risk status (technical quality) in sampled NHIS-accredited facilities in Ghana?

MATERIALS AND METHODS

Study design and data collection

This paper reports on findings of a baseline study which is part of a Randomized Control Trial (RCT) project initiated in 2011 aimed at improving (re)enrolment rates in Ghana’s NHIS through client-centred quality healthcare (see Alhassan et al., [28]). The baseline study design included household and health facility level surveys conducted in the catchment area of 64 sampled NHIS-accredited clinics/health centres. In addition, clinic staff interviews were conducted alongside patient safety and risk status assessment in these same health facilities. The patient safety and risk reduction indicators were used as proxies for technical quality. The term “technical quality” is thus used to represent findings of the patient safety and risk reduction assessments.

Study sites and context

There are over 5, 000 private and public healthcare facilities serving an estimated population of 26.9 million people in 10 administrative regions in Ghana. Out of this number, 3,575 have been accredited (licensed) to render services to NHIS subscribers [29].

This study was conducted in the Greater Accra and Western regions located in the southern part of Ghana. The Greater Accra region (GAR) is predominantly urban and cosmopolitan with close to 4 million people and 416 NHIS-accredited healthcare facilities. The Western region (WR) is largely rural with a population of a little over 2 million people and 438 NHIS-accredited health facilities [29]. Out of the estimated 8.9 million active membership in Ghana’s NHIS in 2012, 13.5% and 10.1% of them were resident in GAR and WR respectively. There are 144 NHIA district offices; out of this number, 10 are in GAR and 15 in WR [29]. The NHIA district offices do not represent administrative districts since not all administrative districts necessarily have an NHIA district office.

Sampling procedure

The sampling procedure was a mixed-methods approach using probability and non-probability sampling techniques at the district, health facility, health staff and household levels.
Sampling NHIS districts
A total of 16 NHIS district offices, 8 in each region, were purposively sampled for the study and used as proxies for administrative districts. All the districts offices eligible for selection into the study had one NHIS district office serving the population. Principal component analysis (PCA) was used to select the NHIS districts and health facilities to ensure comparability. The PCA was used to generate scores for the districts offices and catchment area using (i) the district population, (ii) enrolment rate, (iii) number of NHIS-accredited facilities per 1,000 population and (iv) number of non-accredited facilities per 1,000 population. Based on these parameters, 8 NHIS district offices with same or almost same PCA scores were purposively sampled from each region for inclusion in the study.

Sampling health facilities
At the district level, NHIS accreditation data on all primary health facilities in the 16 sampled districts was used to generate PCA scores. Next, in each district 4 health facilities with the same or almost the same scores were sampled to ensure that the facilities were comparable. Per this criterion, a total of 64 health facilities (32 in each region) were sampled. The 32 facilities from each region represented approximately 28% of accredited primary health facilities in the Western and Greater Accra regions as at 2012. Only NHIS-accredited health facilities were purposively sampled for the study because of the primary focus on healthcare quality in the context of the NHIS.

Sampling households
The catchment area of the sampled health facilities was chosen as the preferred option for sampling the households. Thereafter, between 3 and 5 enumeration areas (EAs) were identified within the catchment area of each health facility with the help of EA maps obtained from the Ghana Statistical Service (GSS). The sampling of households was done within a 10 km radius of the 64 sampled health facilities to ensure that clients’ responses were relevant to the quality of services rendered in these pertinent health facilities. During the interviews, respondents were asked if they have accessed their nearest health facility for health services in the past six months. This formed part of the criteria for proceeding to ask questions related to their experiences with the quality of health services. All residential buildings within the selected EAs were listed followed by a random sampling of 30 residential buildings from the selected EAs. The random sampling of these residential buildings was such that the number selected from each EA has probability proportional to the number of buildings listed in that EA. Per this criterion 30 households were randomly sampled, one from each of the selected residential buildings. The number of households within each residential building was identified based on the study’s definition of household. Household is operationally defined to consist of a person or group related or unrelated, who live together in the same housing unit, and share the same housekeeping and cooking arrangements. The housing unit acknowledges one adult male or female as the head of the household, and are considered as one unit.

Sampling health staff
At the health facility level, clinical (n = 272) and support staff (n = 52) with at least 6 months working experience were randomly sampled from the 64 facilities. To prevent potential skewed responses, at most one respondent from each available professional category was randomly sampled and interviewed. The categories of clinical health personnel involved in the study include: medical doctors, medical assistants, professional nurses, nurse-assistants, pharmacist, pharmacist-assistants, midwives, laboratory technologists and laboratory technicians. The support staff include health service administrators, accounting staff, secretaries, receptionists, NHIS contact persons and medical records officers.

Instruments of data collection
Three main instruments were used for the primary data collection, namely the SafeCare Essentials tool to "measure" technical quality of care, a health facility staff questionnaire to ascertain staff perceptions of quality, and a household questionnaire to determine client perceptions of the quality of health care. The SafeCare Essentials tool used to assess patient safety and risk reduction efforts in the selected facilities is provided by the SafeCare Initiative, a collaboration of the PharmAccess Foundation, the Council for Health Services Accreditation of Southern Africa (COHSASA), and the Joint Commission International (JCI). The tool is designed to identify the capability of a facility to move slowly or more rapidly towards higher levels of clinical quality and safer patient care according to staff efforts [30].

The SafeCare Essentials tool comprised of 41 assessment criteria categorized into five risk areas. The five primary risk areas are: leadership and accountability (7 criteria); competent and capable workforce (7 criteria); safe environment for staff and patients (10 criteria); clinical care of patients (10 criteria); and improvement of quality and safety (7 criteria). Each assessment criterion is scored on a four-point scale (0–3) called "Levels of Effort": High levels depict better efforts by staff of pertinent health facility towards enhancing patient safety and reducing risk (i.e. proxy technical quality healthcare).

During implementation of the SafeCare Essentials tool, a health facility is scored Zero (0) for a particular quality criterion if the desired quality improvement activity is absent or there is mostly ad hoc activity related to risk reduction. One (1) is scored when the structure of more uniform risk-reduction activity begins to emerge in the pertinent health facility. Two (2) is scored when there are processes in place for consistent and effective risk-reduction in the health facility. Three (3) is scored when there are data to confirm successful risk-reduction strategies and continuous improvement.

Personal digital assistant (PDA) devices were used by two trained research assistants to do double scoring per healthcare facility. The two research assistants later reconciled scores after every assessment. The assessments were done objectively using a combination of direct observations, interviews with health managers, inspection and verification from administrative records (excluding patient medical records).
The SafeCare Essentials tool is deemed appropriate for the Ghanaian and African context because it has been used in over 2,000 health facilities in Ghana, Nigeria, South Africa, Kenya, Mozambique and Namibia prior to its adoption in this study [30].

For the purposes of our analysis, mean percentage (%) scores were computed for each of the sampled health facilities based on their scores on the 41 assessment criteria. For every health facility, the mean % scores were computed by summing all applicable criteria scores (0-3) under each risk area divided by the total expected score per risk area and multiplied by 100. High mean % scores thus depict better levels of effort towards patient safety and quality by staff and vice versa. To attain the overall "technical quality" score per health facility, the mean scores in the five primary risk areas were summed. In view of this scoring design, the risk assessment scores on each of the 64 sampled health facilities were used as proxy indicators for technical quality healthcare.

The household and health facility staff questionnaires explored respondents’ socio-demographic characteristics, employment status of household heads, professional category, insurance enrolment status and perceptions on quality of health care services in the nearest NHIS-accredited health facility.

Household heads and health staff were asked triangulated questions on perceptions of healthcare quality by ranking their levels of satisfaction with service quality in the following areas: avenues/places for complaint lodging; process of lodging complaint; compassion and supportiveness of health staff; respectfulness of health staff; equal treatment of insured and uninsured patients; adequacy of consulting rooms and medical equipment; access to all prescribed drugs at the facility; overall satisfaction with health services provided by facility; information provided by facility; sufficiency of medical staff, and overall waiting time at the facility. The household questions on the various healthcare quality proxies were on a 5 point Likert scale from 1 = "Very dissatisfactory" to 5 = "Very satisfactory" while the health facility staff questions were on a 4 point Likert scale from 1 = "Very dissatisfactory" to 4 = "Very satisfactory".

Different measurement scales were used because the surveys for clients and staff were conducted separately though concurrently. Though there is no explicit scientific opinion on this approach, intuitively it was meant to promote reliability in responses under the circumstances.

The scale reliability for the 12 Likert scale items was checked and Cronbach's alpha found to be 0.86 and 0.70 for household and health staff respectively which are within the 0.70-1.00 rule of thumb [31,32].

The data collection tools were piloted in one conveniently sampled district in the Greater Accra region. The aim of the pilot was to help enhance the scientific rigor, feasibility and value of the full-scale study.

**Ethical considerations**

Ethical clearance for the study was obtained from the Ghana Health Service (GHS) Ethical Review Committee [ERC] [clearance numbers: GHS-ERC: 18/5/11 and GHS-ERC 08/5/11]. Informed consent was also obtained from individual respondents in the communities and health facilities.

All literate respondents provided written informed consent while illiterate respondents thumbprinted the informed consent form before participating in the study.

For the purposes of clarity this RCT was not a clinical trial because randomization into control and intervention groups was not done at the human subjects’ levels but at health facilities level. Health staff who by chance worked in intervention or control facilities were randomly sampled and interviewed. Similarly, household heads who by chance lived around the catchment area of intervention or control facilities were randomly interviewed. This study design did not demand a trial registration according to the ethical review protocols of the Ghana Health Service Ethical Review Committee. The health facilities were randomly assigned based on parameters such as outpatient and inpatient attendance, accreditation grade score, ownership and location (rural or urban).

**Statistical analysis**

The data sets were analysed with Stata statistical software (version 12.0) after data cleaning and coding to anonymize responses. To ensure internal validity, all questions were informed by research objectives and reviewed literature. The household and health provider data sets were merged into a single data set to enable comparison and cross tabulation of variables of interest.

Wilcoxon-Mann Whitney test was used to test the null hypothesis that perceptions of clients and health staff on the 12 service quality dimensions are not significantly different. Summary statistics (mean) were used to ascertain the average responses of staff and clients on the Likert scales [6,24] while descriptive statistics were performed on socio-demographic characteristics of clients and health staff.

Iterated principal factor (ipf) analysis was used categorize the 12 perceived/non-technical quality healthcare dimensions into three main factors namely: "Complaint lodging, handling and feedback"; "Respect, compassion and supportiveness of staff" and "Adequacy of information provision, staff and services". Because the outcome variable of interest is in ordinal scale, ordered logistic regression analysis was performed to ascertain whether or not patient safety and risk status (technical quality) significantly predicts client and health staff perceived quality healthcare. The outcome variables were measured by computing the average perception for a health facility by staff and clients based on the 12 quality healthcare proxies. Control variables included in the regression models were respondents’ age, gender, marital status, religion, level of education, income levels (households only), and professional category (health staff only). Health facility ownership, rural-urban location and region were also controlled for in the regression model.

Multi-collinearity diagnostics were conducted on all explanatory variables of interest prior to their inclusion in the regression model and none had a variance inflation factor (VIF) above 10.0 [32]. The Likert scale responses used to fit the ordered logistic regression model fulfilled the proportional odds assumption following the Brant test [33]. Marginal effects of the explanatory variables in the regression model were also computed. Computation of marginal effects is one way to measure the effects of independent variables on a dependent variable. The marginal effect of an independent variable measures its impact of change on the expected change in the
independent variable, especially when the change in the independent variable is infinitely small or merely marginal [34].

RESULTS

Socio-demographic characteristics of clients and health staff

Out of the 1,920 household questionnaires administered, a total of 1,903 household heads completely responded, representing a return rate of 99%. Out of the 333 health staff questionnaires administered, 324 were retrieved with complete responses representing a 97% return rate. The average number of household heads interviewed within the catchment area of a health facility was 30 and the average number of staff respondents per health facility was 5.

The average age for interviewed household heads was 45 years (SD = 15); 53% of them were married and 64% were males. A little over 50% of household heads had a maximum of basic education and 37% of them were insured; urban dwelling household heads constituted 50% of respondents, and 89% mentioned Christianity as their religion. At the health staff level, the average age of respondents was 39 years (SD = 14); 43% were married and 33% were males; 63% of the health staff had at least basic education qualification. Majority of health staff (72%) were insured and 44% of them worked in urban areas; Christianity was mentioned by 96% of the staff as their religion (see Table 1).

Clinical staff (n = 272) dominated the sample of health staff comprising of medical doctors (n = 12), medical assistants (n = 13), midwives (n = 45), nursing staff (n = 138), pharmacy staff (n = 36) and laboratory staff (n = 28). Non-clinical staff (n = 52) comprised of accounting staff (n = 2), an administrator, NHIS contact persons/claims officers (n = 43), receptionists (n = 2), medical records officers (n = 3) and a secretary.

Differences in clients and staff perceptions of quality of health services

The results showed significant perception differences on the selected healthcare quality indicators by clients and health staff. Overall, health staff perceived many of the quality healthcare indicators to be satisfactory in the NHIS-accredited health facilities, in contrast to clients (P < 0.0001). Wider staff-client perception gaps/differences were observed in the areas of “satisfaction with health services provision by health staff” (staff mean = 3.62; client mean = 1.95, P < 0.0001); “information to clients by health facility” (staff mean = 2.07; client mean = 3.68, P < 0.0001).

Other perceptions gaps were on “compassion and supportiveness of health personnel” (staff mean = 3.31; client mean = 1.90, P < 0.0001); “respectfulness of doctors/medical assistants/nurses” (staff mean = 3.24; client mean=1.91, P <0.0001); “equal treatment for insured and uninsured patients” (staff mean = 1.24; client mean = 2.48, P <0.0001), and “overall waiting time at the health facility” (staff mean = 3.24; client mean = 2.14, P <0.0001). While staff appeared to express satisfaction with many of these quality healthcare markers, clients seemed to be disappointed.

<table>
<thead>
<tr>
<th>Table 1: Socio-demographic characteristics of clients and health staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
</tr>
<tr>
<td>Age (Mean, SD)</td>
</tr>
<tr>
<td>%</td>
</tr>
<tr>
<td>Males</td>
</tr>
<tr>
<td>Educational qualification</td>
</tr>
<tr>
<td>Basic</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>Tertiary</td>
</tr>
<tr>
<td>Uneducated</td>
</tr>
<tr>
<td>Clinical health staff</td>
</tr>
<tr>
<td>Married respondents</td>
</tr>
<tr>
<td>Employed respondents</td>
</tr>
<tr>
<td>Christian respondents</td>
</tr>
<tr>
<td>Location</td>
</tr>
<tr>
<td>Rural</td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td>Region</td>
</tr>
<tr>
<td>Greater Accra</td>
</tr>
<tr>
<td>Western</td>
</tr>
<tr>
<td>Currently insured</td>
</tr>
<tr>
<td>Currently uninsured</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Project Household and Health Facility Surveys (March, 2012)

*These include those insured with the NHIS and other forms of private health insurance schemes; “Clinical staff includes medical staff who have direct contact with patients (e.g. medical doctors, nursing personnel, pharmacy personnel, medical assistants and laboratory personnel). Non-clinical staff are the support staff who do not have direct contact with patients (e.g. administrators, accountants, labourers and receptionists).

Legend: NA = Not applicable. t-test statistically significant (P <0.0001). Pearson Chi-square test statistically significant (P <0.05; **P <0.001)

Technical quality healthcare in sampled health facilities

All 64 sampled health facilities were assessed using the SafeCare Essentials tool, representing 100% participation. The results indicate that technical healthcare quality in the 64 sampled health facilities was generally low with an overall average score of 1.07 (SD = 0.22) out of the ideal score of 3.00 (see Table 3). Majority of the health facilities scored particularly low marks in the areas of “clinical outcomes monitoring” (mean = 0.08, SD = 0.27), “availability and use of clinical guidelines” (mean = 0.23, SD = 0.56), “correct identification of patients” (mean=0.19, SD=0.59), “communication among healthcare providers” (mean = 0.39, SD = 0.73), “availability of policies and procedures for high risk patients” (mean = 0.50, SD = 0.82), “presence of fire safety programme” (mean = 0.47, SD = 0.50), and “appropriateness of surgical services” (mean = 0.53, SD = 0.69).
Areas where most health facilities demonstrated comparatively better performance towards technical quality healthcare improvement were: “leadership and accountability responsibilities” (mean = 1.91, SD = 0.39), “commitment to patients and family rights” (mean = 0.89, SD = 0.31), and “proper disposal of infectious waste” (mean = 0.91, SD = 0.40).

Table 2: Differences in client and health staff perceptions of healthcare quality

<table>
<thead>
<tr>
<th>Quality healthcare proxies</th>
<th>Mean Ratings</th>
<th>Wilcoxon test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Health staff</td>
<td>Client Mean</td>
</tr>
<tr>
<td>Complaint lodging, handling and feedback</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Avenues for complaint in health facility</td>
<td>3.57</td>
<td>2.49</td>
</tr>
<tr>
<td>Satisfaction with place/desk for lodging complaints</td>
<td>3.66</td>
<td>2.68</td>
</tr>
<tr>
<td>Process of lodging complaint at the health facility</td>
<td>3.61</td>
<td>2.73</td>
</tr>
<tr>
<td>Respect, compassion and supportiveness of health staff</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Compassion and supportiveness of health personnel</td>
<td>3.31</td>
<td>1.90</td>
</tr>
<tr>
<td>Respectfulness of doctors/medical assistants/nurses</td>
<td>3.24</td>
<td>1.91</td>
</tr>
<tr>
<td>Equal treatment for insured and uninsured patients</td>
<td>1.24</td>
<td>2.48</td>
</tr>
<tr>
<td>Adequacy of information provision, staff and services</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Adequacy of consulting rooms and medical equipment</td>
<td>2.74</td>
<td>2.32</td>
</tr>
<tr>
<td>Access to all prescribed drugs from the facility</td>
<td>3.00</td>
<td>2.38</td>
</tr>
<tr>
<td>Satisfaction with health services provided by health staff</td>
<td>3.62</td>
<td>1.95</td>
</tr>
<tr>
<td>Information provided by the health facility</td>
<td>2.07</td>
<td>3.68</td>
</tr>
<tr>
<td>Sufficiency of good Docs./Med. Assistants/Nurses</td>
<td>2.63</td>
<td>2.11</td>
</tr>
<tr>
<td>Overall waiting time at the health facility</td>
<td>3.24</td>
<td>2.14</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Project Household and Health Facility Surveys (March, 2012)

Table 3: Average score per technical quality healthcare proxy (n = 64)

<table>
<thead>
<tr>
<th>Risk assessment areas (technical quality proxies)</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership processes and accountability</td>
<td>Mean, Std. Dev, Min, Max</td>
</tr>
<tr>
<td>1. Leadership and accountability responsibilities</td>
<td>1.91, 0.39, 0, 3</td>
</tr>
<tr>
<td>2. Leadership for quality and patient safety</td>
<td>1.67, 0.47, 1, 2</td>
</tr>
<tr>
<td>3. Day to day planning is collaborative</td>
<td>1.42, 0.64, 0, 2</td>
</tr>
<tr>
<td>4. Clinical and managerial contracts are effectively managed</td>
<td>1.53, 0.67, 0, 2</td>
</tr>
<tr>
<td>5. Compliance with all laws and regulations related to the clinic</td>
<td>0.88, 0.63, 0, 2</td>
</tr>
<tr>
<td>6. Clear commitment to patient and family rights</td>
<td>1.89, 0.31, 1, 2</td>
</tr>
<tr>
<td>7. Policies and procedures for high-risk procedures and patients</td>
<td>0.50, 0.82, 0, 3</td>
</tr>
</tbody>
</table>

Table 3: Average score per technical quality healthcare proxy (n = 64)

Risk assessment areas (technical quality proxies) | Statistics |
<table>
<thead>
<tr>
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</tr>
</tbody>
</table>

Association between perceived and technical quality healthcare in health facilities

Results of a Spearman’s correlation test (Table 4) showed that client perception of healthcare quality correlates negatively with technical quality healthcare proxies (coef. = -0.0991, p<0.0001). In contrast, a strong positive correlation was observed between staff perception of healthcare quality and technical quality (coef. = 0.4600, p<0.0001). Likewise, client-perceived quality positively correlated with staff-perceived quality (coef. = 0.1054; p<0.0001) (see Table 4).
The change in probability for one instant change in technical quality score and clients’ age is almost 0.0 percentage point (P <0.05). The change in probability for public facility relative to private was 0.49 percentage point while that for rural against urban was 0.095 percentage point (P <0.05). In terms of wealth quintiles of clients, the change in probability for one unit increase in wealth appeared to reduce the marginal percentage points on clients’ responses (see Table 5) (P <0.05).

Analysis of the staff data showed that the change in probability for one unit increase in technical quality is approximately 0 percentage points while that for rural against urban location of staff was 0.04 percentage point (P <0.05). Clients who were located in rural areas and found in relatively lower wealth quintiles appeared to have better perspectives of healthcare quality than those located in urban areas and higher wealth quintiles (P <0.0001). Increasing client age did not seem to favour perceptions on healthcare quality (P <0.05). Health staff working in rural clinics/health centres also appeared to have negative perspectives of healthcare quality than their counterparts in urban health facilities (P <0.0001).

Table 5: Bivariate analysis of predictors of client and staff perceived quality healthcare with marginal effects

<table>
<thead>
<tr>
<th>Model 1 Independent variables</th>
<th>Coef.</th>
<th>Std. Err</th>
<th>Marginal Effect*</th>
<th>(95%Conf. Int.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical quality</td>
<td>-0.010*</td>
<td>0.005</td>
<td>0.0002</td>
<td>-0.028</td>
</tr>
<tr>
<td>Age (mean=45 years)</td>
<td>-0.006*</td>
<td>0.003</td>
<td>0.0000</td>
<td>-0.011</td>
</tr>
<tr>
<td>Females</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Males</td>
<td>0.014</td>
<td>0.097</td>
<td>-0.0002</td>
<td>-0.176</td>
</tr>
<tr>
<td>Not married</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Married</td>
<td>-0.130</td>
<td>0.092</td>
<td>-0.0019</td>
<td>-0.317</td>
</tr>
<tr>
<td>Other religions</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Christian religion</td>
<td>-0.141</td>
<td>0.127</td>
<td>0.0020</td>
<td>-0.391</td>
</tr>
<tr>
<td>Educated</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>No formal education</td>
<td>-0.056</td>
<td>0.125</td>
<td>0.0008</td>
<td>-0.301</td>
</tr>
<tr>
<td>Public facility</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Private facility</td>
<td>-0.353**</td>
<td>0.100</td>
<td>0.0049</td>
<td>-0.549</td>
</tr>
<tr>
<td>Urban location</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Rural location</td>
<td>0.684**</td>
<td>0.980</td>
<td>-0.0095</td>
<td>0.492</td>
</tr>
<tr>
<td>Wealth quintile 1</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Wealth quintile 2</td>
<td>0.420**</td>
<td>0.118</td>
<td>-0.0078</td>
<td>0.188</td>
</tr>
<tr>
<td>Wealth quintile 3</td>
<td>0.496**</td>
<td>0.127</td>
<td>-0.0089</td>
<td>0.247</td>
</tr>
<tr>
<td>Wealth quintile 4</td>
<td>0.980**</td>
<td>0.130</td>
<td>-0.0143</td>
<td>0.724</td>
</tr>
<tr>
<td>Wealth quintile 5</td>
<td>0.915**</td>
<td>0.134</td>
<td>-0.0137</td>
<td>0.652</td>
</tr>
</tbody>
</table>

Factors associated with client and staff perception of healthcare quality

Ordered logistic regression results further confirmed that technical quality healthcare in health facilities negatively correlated with client perception of service quality but positively correlated with staff-perceived quality healthcare (P <0.05) (see Table 5). The results show that for one unit increase in technical quality score, we expect a 0.018 decrease in the log odds of client perceiving quality healthcare as very satisfactory, holding other variables constant (P <0.05). In the case of health care providers, a unit increase in technical quality score is expected to increase the log odds of staff perceiving quality healthcare as very satisfactory by 0.11, holding other variables constant (P <0.0001).

Table 4: Association between perceived and technical quality healthcare

<table>
<thead>
<tr>
<th>Quality dimensions</th>
<th>Client-perceived quality&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Staff-perceived quality&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Technical quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client-perceived quality</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff-perceived quality</td>
<td>0.1054**</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>Technical quality</td>
<td>-0.0991**</td>
<td>0.4600**</td>
<td>1.0800</td>
</tr>
</tbody>
</table>

<sup>a</sup>Staff and client perceived quality healthcare were measured by computing the average perception for health facility by staff and clients using the 12 quality healthcare proxies presented in Table 2.

<sup>b</sup>Spearman correlation coefficient statistically significant (P <0.0001).

Table 3: (Continued)

<table>
<thead>
<tr>
<th>Risk assessment areas (technical quality proxies)</th>
<th>Mean&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of quality and safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35. There is a process for collecting and reviewing events that are unexpected and/potentially harmful to patients</td>
<td>1.05</td>
<td>0.33</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>36. High-risk processes are high-risk patients are monitored</td>
<td>1.19</td>
<td>0.43</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>37. Patient experience is monitored</td>
<td>1.09</td>
<td>0.46</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>38. There is a complaint process</td>
<td>1.02</td>
<td>0.42</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>39. Clinical guidelines and pathways are available and used</td>
<td>0.23</td>
<td>0.56</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>40. Staff understand how to improve processes</td>
<td>1.00</td>
<td>0.71</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>41. Clinical outcomes are monitored</td>
<td>0.08</td>
<td>0.27</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Overall average technical quality healthcare&lt;sup&gt;1&lt;/sup&gt;</td>
<td>1.07</td>
<td>0.22</td>
<td>0.63</td>
<td>1.58</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Project Household and Health Facility Surveys (March, 2012)

<sup>c</sup>Overall average technical quality healthcare score computed by summing quality scores of all 64 facilities divided by the 41 quality healthcare criteria.

<sup>1</sup>Mean scores depict the levels of effort demonstrated by health facilities per each risk area from 0 – 3 where high values suggest better performance towards patient safety and risk reduction and vice versa. Zero (0) is scored when the desired quality improvement activity in a clinic is absent or there is mostly ad hoc activity related to risk reduction. One (1) is scored when the structure of more uniform risk-reduction activity begins to emerge in a clinic. Two (2) is scored when there are processes in place for consistent and effective risk-reduction. Three (3) is scored when there are data to confirm successful risk-reduction strategies and continuous improvement.
DISCUSSION

The study found that health staff’s perception of service quality correlates positively with technical quality. However, clients’ perceptions of service quality were negatively associated with technical quality in sampled health facilities. Staff and clients were found to have different perceptions of what constitutes healthcare quality. Overall, health staff perceived the quality of services they render to clients as satisfactory contrary to perceptions of clients who perceived the quality of services to be dissatisfactory (see Table 2). The low patient satisfaction levels with health service quality is consistent with findings of previous patient satisfaction surveys on Ghana [5,9,14,15,35,36].

These findings suggest there is room for improvement in quality of health service delivery, particularly from the client’s perspective. Intensifying efforts towards meeting expectations of clients while maintaining technical quality requirements will likely lead to higher client trust and confidence in service providers which is a good recipe for higher health insurance uptake, retention and utilization of safer healthcare services. The differences in perceptions of clients and staff could be attributed to a number of factors which include respondents’ understanding of the healthcare quality issues at stake. The relatively higher satisfaction ratings by health staff on many of the quality healthcare proxies could be attributed to tendency of health staff to give more favourable answers to portray “a good name” for their facilities or perhaps health staff were complacent of their efforts towards quality service delivery.

Information asymmetry between the health staff and clients also possibly explain the differences in perceptions on service quality. For instance, even though complaint systems might exist in health facilities if clients are not adequately informed on how to use them, client perceptions will remain low. Parasuraman et al. [3] described this missing link as a quality healthcare gap between clients’ expectations and perceptions of health providers on what clients expect. Effective bottom-up communication system between clients and service providers could help bridge this gap.

Routine community engagement sessions involving staff and clients on the components of healthcare quality could help improve the staff-client perception differences. These platforms will help educate participants on their rights and responsibilities and offer health providers the opportunity to improve on client-perceived quality healthcare gaps. Clients should also be educated on the dynamics of healthcare delivery and the need for realistic expectations/demands cognizant of the available human and material resource capacity of health facilities.

Unbalanced commitments towards technical and perceived quality healthcare improvement could be another reason for the negative association between technical and client-perceived quality healthcare dimensions. Healthcare facilities which do not recognise clients have concerns with human relations of staff could lead them to perpetually render services that do not satisfy clients’ needs even though adherence to professional practices (technical quality) might be adequate. This gap could be addressed by stepping up client-centred care and community engagement interventions in the service delivery process. De Man et al [24] made similar proposal when
they found that perspectives of staff and clients differed significantly on many quality healthcare markers.

The technical quality assessment findings (see Table 3) show low performance of sampled health facilities on many of the technical quality healthcare criteria. The results showed that none of the mean scores attained by the health facilities were up to the 3.0 ideal score. This implies majority of the health facilities did not have uniform processes in place for consistent and effective patient safety. The results also suggest that many of the health facilities did not have data to confirm successful risk-reduction strategies and continuous improvement. All in all, the low mean scores depict potentially widespread ad hoc processes and activities related to risk reduction and patient safety (technical quality healthcare).

These findings underscore the need for the National Health Insurance Authority (NHIA) to intensify routine post accreditation monitoring system that integrates non-technical quality healthcare indicators into the mainstream monitoring tools to help promote client-centred quality healthcare improvement while maintaining medical technical quality healthcare standards. This approach could help enhance client trust and confidence in NHIS-accredited health facilities and contribute towards sustaining the NHIS.

The negative correlation between client-perceived quality healthcare and technical quality in health facilities imply that improvement in technical quality per se will not necessarily correspond with increased client satisfaction with quality of health services. Robyn et al. [23] made similar observations in a study in Burkina Faso where highly rated client satisfaction scores correlated negatively with adherence to technical quality healthcare practices. Balanced commitment to both perceived and technical components of healthcare quality thus appear to be a better strategy towards wholistic healthcare quality improvement.

Besides the above posits, perhaps the negative association between technical and client-perceived quality healthcare is due to the fact that the SafeCare Essentials tool by design has no informative value on client experiences and perception of service quality since it was mainly developed to measure technical components of healthcare. The tool does not take into account client-perceived quality healthcare.

Even though intuitively one would expect that high efforts towards technical quality healthcare translate into higher client-perceived quality, it is not always the case because of information asymmetry. For instance, some clients will likely describe good quality healthcare to be prescription of large quantities of drugs and injections per outpatient visit but this would constitute irrational use of drugs or polypharmacy in medical practice. Moreover, a health staff may be perceived as unfriendly and/or disrespectful towards patients but professionally more competent than colleagues perceived to be friendly or respectful. Health illiteracy on the part of clients especially in many developing countries potentially misinforms clients in their interpretation of what constitutes good healthcare quality [37].

In sum, these findings highlight the need for health managers and policy makers to balance efforts towards technical quality improvement with functional quality dimensions such as attitudes of staff, timeliness of care and client support systems which clients perceive as important indicators of quality healthcare. This balanced approach can be achieved by incorporating functional quality dimensions into mainstream official quality monitoring and evaluation frameworks.

While acknowledging the importance of technical quality healthcare standards, there is also the tendency for it to be over emphasized by health managers and policy makers to the neglect of non-technical quality healthcare dimensions which do not often take much resources and efforts to improve. Intensified patient education, engagement and patient-friendly quality improvement interventions could help bridge these quality healthcare gaps.

Limitations
The authors acknowledge some limitations associated with this study. First, the study was conducted in two (2) out of ten (10) regions in Ghana, thus the sample size might not be representative of the Ghanaian population. Respondents’ experiences of service quality could differ significantly in other regions of Ghana. Moreover, the outlier districts (in terms of remoteness and the PCA criteria), as well as outlier health facilities (in terms of accreditation scores and other PCA criteria) had less probability of being selected. In view of this limitation in sampling, the results could be influenced by the cadre of districts and health facilities sampled.

Secondly, only primary healthcare facilities (mostly located in rural areas) were sampled for the study implying that the findings might not reflect conditions in higher level facilities often located in better endowed urban areas.

Finally, the SafeCare Essentials criteria applied in this study were used as proxies of technical quality healthcare. Detailed technical quality healthcare assessment was not done due to limited time and resources available to the researchers. Nonetheless, the tool remains relevant to the Ghanaian healthcare system because it gives a snapshot of the healthcare quality challenges confronting health facilities. Moreover, implementation of the tool in Ghana and other African countries such as Tanzania, Nigeria, Mozambique, Namibia and Kenya gives credence to its relevance and appropriateness for this study. In light this, the tool is proposed to the National Health Insurance Authority (NHIA) for possible adoption as an NHIA rapid pre-accreditation tool for public and private facilities to help enhance performance of health facilities during accreditation.

Policy recommendations
Based on the findings of the study the following recommendations are proposed:

1. The Ghana Health Service (GHS)/Ministry of Health (MoH) should initiate discussions on a possible staff appraisal system that incorporates feedback on staff performance from clients or organised community-based groups/associations. This could help make health staff more accountable to clients and promote client-centred quality healthcare delivery. The feasibility of this initiative should however be piloted and mindful of the mobile nature of clients and staff.

2. Communities should be empowered through active engagement in routine assessment of the quality of services rendered by health facilities and reward systems given to facilities that are...
perceived by the community to be client-centred. This could encourage healthy competition among facilities and promote a balanced approach to quality improvement.

3. The NHIA should decentralize and effectively monitor its post accreditation monitoring for NHIS-accredited health facilities to ensure quality standards are maintained after accreditation. District level NHIA offices should be well resourced to undertake these monitoring activities more frequently and effectively.

4. Finally, the NHIA should initiate policy dialogues and stakeholder consultations on possibly integrating non-technical quality care dimensions into its post accreditation monitoring framework health facilities. This will help motivate facilities to prioritize client-centred quality services.

Conclusion

Quality of healthcare as perceived by clients and per the SafeCare Essentials assessment is low in majority of the sampled NHIS-accredited health facilities in Ghana. Contrary to clients, it appeared health staff perceive the quality healthcare situation to be good, evident in their higher satisfaction ratings on quality healthcare markers. These differences are indicative of a possible communication gap and information asymmetry between clients and service providers.

There is the need for quality improvement efforts that prioritize client-centred quality, especially in primary healthcare facilities which constitute over 70% of the over 3,000 NHIS-accredited health facilities in Ghana. These cadre of health facilities provide basic primary healthcare services which is critical to sustain the gatekeeper system under the NHIS. Client-centred approach will help improve the existing information asymmetry between clients and service providers on what constitutes quality healthcare and mitigate unrealistic expectations from clients.

Clients’ measure of quality healthcare usually hinges on interpersonal and non-technical quality indicators that health providers might overlook. While acknowledging the importance of medical technical quality in health service delivery, balancing it with client-perceived quality will prove beneficial towards enhancing client confidence and trust in the healthcare system which is essential for a viable health insurance system in Ghana and Africa at large.

Acknowledgement/Funding

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REFERENCES


ABSTRACT

Background
Despite improvements in a number of health outcome indicators partly due to the National Health Insurance Scheme (NHIS), Ghana is unlikely to attain all its health-related millennium development goals before the end of 2015. Inefficient use of available limited resources has been cited as a contributory factor for this predicament. This study sought to explore efficiency levels of NHIS-accredited private and public health facilities; ascertain factors that account for differences in efficiency and determine the association between quality healthcare and efficiency levels.

Methods
The study is a cross-sectional survey of NHIS-accredited primary health facilities (n = 64) in two regions in southern Ghana. Data Envelopment Analysis was used to estimate technical efficiency of sampled health facilities while Tobit regression was employed to predict factors associated with efficiency levels. Spearman correlation test was performed to determine the association between quality healthcare and efficiency.

Results
Overall, 20 out of the 64 health facilities (31%) were optimally efficient relative to their peers. Out of the 20 efficient facilities, 10 (50%) were Public/government facilities; 8 (40%) were private-for-profit facilities and 2 (10%) were Private-not-for-profit/Mission facilities. Mission (Coef. = 52.1; P = 0.000) and Public (Coef. = 42.9; P = 0.002) facilities located in the Western region (predominantly rural) had higher odds of attaining the 100% technical efficiency benchmark than those located in the Greater Accra region (largely urban). No significant association was found between technical efficiency scores of health facilities and many technical quality healthcare proxies, except in overall quality score per the NHIS accreditation data (Coef. = -0.3158; P <0.05) where the association was negative.

Conclusions
The findings suggest some level of wastage of health resources in many healthcare facilities, especially those located in urban areas. The Ministry of Health and relevant stakeholders should undertake more effective need analysis to inform resource allocation, distribution and capacity building to promote efficient utilization of limited resources without compromising quality healthcare standards.

BACKGROUND

Within the West African sub-region, Ghana is performing relatively better than its neighbours on most health indicators. As at 2012, life expectancy at birth was 61 years compared to 56 in Burkina Faso; 50 in Cote d’Ivoire and 56 in Togo [1]. Likewise, under-five mortality was 69 per 1,000 live births in Ghana compared to 166 in Burkina Faso and 119 in Cote d’Ivoire [2].

Notwithstanding these achievements, limited health resources keep confronting the country in meeting its health targets including the health-related millennium development goals (MDGs) [3]. This necessitates more efficiency at all levels of the health system especially at the primary healthcare level where resources are more scarce, albeit over 50% of the Ghanaian population access basic healthcare at this level.

Ghana’s healthcare system is divided into three administrative levels namely national, regional and district. At the national level, the Ministry of Health (MoH) is responsible for policy formulation and resource mobilization while the national headquarters of the Ghana Health Service (GHS) is responsible for policy implementation through the regional and district health administrations. At the regional level, the regional health administration (RHA) is responsible for administration of health services delivery in a particular region and supervises activities of the district health management teams (DHMTs). The district level is managed by the DHMTs. District hospitals, health centres, clinics and community-based health planning and services (CHPS) compounds are monitored and supervised by the DHMTs.

In Ghana, formal health service delivery is executed by 3 teaching hospitals, 9 regional hospitals, 3 psychiatric hospitals, 343 district hospitals, over 2,000 clinics, health centres and polyclinics. In terms of ownership, there are 1,607 government owned facilities, 91 quasi-government, 245 mission and 1,277 private-for-private facilities [4].

Primary healthcare services are rendered by primary providers such as health centres, clinics, CHPS compounds and traditional healers. Health centres and clinics usually serve a community with a population of 15,000-30,000 people with basic curative care, disease prevention, maternal and child health services. Referral cases from the primary healthcare level are sent to district and regional hospitals or teaching hospitals where specialized clinical and diagnostic care are rendered.

Barely a decade after introduction of the National Health Insurance Scheme (NHIS), about 34% of the Ghanaian population are in active membership thus remedying the spiralling cost of healthcare for households and individuals [5,6]. From 2009 to 2013, a cumulative number of 3,828 health facilities have been given full accreditation by the National Health Insurance Authority (NHIA) (regulatory body of the NHIS); out of this number, 1,203 (31%) were clinics and health centres; approximately 54% were government owned, 6% were mission; nearly 40% were private-for-profit; 1% were quasi-government institutions [5].

Even though the NHIS has contributed significantly to improved out-patient and in-patient attendance, reduced maternal mortality rates and increased percentage of skilled deliveries in the country [7], there are increasing concerns with respect to its operational and financial
Besides the escalating cost of claims payment [5], operational inefficiencies in private and public health facilities are cited as potential sustainability threats to the NHIS [14].

Attainment of acceptable efficiency levels in private and public health facilities is captured as a core objective in a number of Ghanaian national policy documents and reports [7,14-17] albeit limited scientific knowledge exists on technical efficiency and facility ownership, especially in the context of NHIS-accredited facilities.

Though some empirical studies have been conducted on technical efficiency of health facilities in Ghana [18-20] and other countries in Africa [21-25], these studies did not explore differences in private and public facilities. Publication by Jehu-Appiah et al. [4] is one known publication on Ghana that compared technical efficiency levels in private and public health facilities. Nonetheless, Jehu-Appiah et al. [4] analysed 2005 data which might not reflect the current situation in sampled facilities. Moreover, health facilities used by Jehu-Appiah et al. [4] were not accredited since formal NHIS accreditation was initiated in 2009.

Given the limited empirical studies on facility ownership and technical efficiency in Ghana, this paper sought to quantify the technical efficiency levels of 64 NHIS-accredited private and public primary health facilities in Ghana and determine what factors account for possible differences. The association between efficiency and quality healthcare is also explored. The hypothesis is that facility ownership has a significant association with efficiency levels, holding other facility characteristics constant.

Findings of this study are expected to inform policy discussions on possible avenues for leveraging public-private partnership in healthcare delivery to improve efficiency levels without compromising good quality healthcare in Ghana and other sub-Saharan African countries.

**METHODS**

**Research setting**

The study was conducted in Greater Accra (GAR) and Western (WR) regions of southern Ghana. The GAR is predominantly urban and cosmopolitan with close to 4 million people and 416 NHIS-accredited healthcare facilities. The WR is largely rural with a population of a little over 2 million people and 438 NHIS-accredited health facilities [15].

**Study design and data collection**

This is a cross-sectional study which is part of a four-year randomized control trial (RCT) project that assesses client-centredness of Ghana’s healthcare provision and administrative services [26]. Data was collected using a tool called Situational Analysis plus (SA’), a component of the SafeCare quality-assessment tool kit [27]. The SA’ tool collects data on health facility services, activities and assets (human and material). The tool was administered by three (3) trained research assistants, who assessed one health facility at a time.

Besides the SA’ tool, quality healthcare delivery in the sampled health facilities was determined using SafeCare Essentials tool (see data analysis section) and secondary data on NHIA accreditation scores. Piloting of SA’ was done in one conveniently sampled health facility in the GAR to check consistency and accuracy. Data collection lasted from March to June, 2012 in both regions.

Private facilities were operationally defined in this study to include private-for-profit, mission and non-governmental organisation (NGO) facilities. Public facilities included government and quasi-government facilities. Primary health facilities are referred to clinics and health centres that mainly render “first-point-of-call” outpatient services.

An NHIS-accredited health facility is a facility that has been assessed by the NHIA based on 11 predetermined standard areas and several sub-assessment criteria/questions. Once a facility meets the required standards, an accreditation certificate is issued for five (5) years on first instance and subsequently renewed every two (2) years. In Ghana, only NHIS-accredited facilities are allowed by law to render services to NHIS subscribers and later submit claims to the NHIA for reimbursement [15].

**Sampling procedures**

Multi-stage sampling technique was adopted where GAR and WR were purposively sampled for rural-urban balance. This was followed by purposive sampling of eight (8) districts from each region after a Principal Component Analysis (PCA). Variables used for the PCA were: average NHIS accredited grade of health facilities in a district; NHIS enrolment rate; district population, and number of accredited and non-accredited health facilities. Likewise, PCA scores were generated for all accredited primary health facilities in the two regions and 32 facilities with closest scores were sampled from each region, making a total of 64. This ensured homogeneity in the sampled health facilities, which is needed to detect effect of implemented interventions by the RCT. Next, each district was proportionally allocated maximum of 4 facilities. The 32 facilities in GAR and WR represent approximately 8% of the total number of accredited facilities in each region. Hospitals and other higher level health facilities were exempted from the study because they are relatively complex for impact evaluation.

**Ethical considerations**

Ethical clearance for the survey was obtained from the Ghana Health Service (GHS) Ethical Review Committee (ERC) (clearance number: GHS-ERC: 18/5/11). Moreover, written informed consent was sought from health facility heads, the district and regional health directorates.

**Measuring efficiency using the DEA approach**

In the literature two principal approaches are used to measure efficiency of firms (including health facilities) namely: Data Envelopment Analysis (DEA) and stochastic frontiers [28]. The DEA model first proposed by Charnes et al. [29] involves the use of linear programming methods to construct non-parametric frontier over the data, while the stochastic frontier is an econometric approach [30].

The DEA approach is used to benchmark performance and the relative efficiency of each production unit among a set of fairly homogeneous Decision Making Units (DMUs), such as clinics
and health centres that use similar inputs to produce service outputs. DMUs deemed optimally efficient among their peers (based on available inputs and outputs) are assigned an efficiency score of 1.0 which is equivalent to 100% in percentage terms.

A health facility is described as fully efficient among its peers when it attains an efficiency score of 1.0 and completely inefficient when it attains an efficiency score of 0.0 (equivalent to 0% in percentage terms). It must be emphasized that facilities estimated as optimally efficient among peers might not necessarily be efficient in absolute terms. There is therefore the need to interpret results of the DEA in the context of relative efficiency of facilities under assessment.

Measurement of efficiency can be technical or allocative and the orientation can be input-orientated or output-orientated; details of these distinctions can be found in Goelli [28]. For the purposes of this study, the focus was on technical efficiency because there was adequate data on the input and output factors of interest. Allocative efficiency was not considered because of inadequate data on cost of services and revenue of the selected 64 facilities, a challenge acknowledged by Akazili et al. [19] and Kirigia et al. [22] in their studies on Ghana and Benin respectively.

Technical efficiency (TE) of a DMU is defined as

$$TE = \frac{\text{Weighted sum of outputs}}{\text{Weighted sum of inputs}}$$

The current analysis used input-orientated technical efficiency measures assuming constant returns to scale (CRS) and variable returns to scale (VRS) [29]. This approach was used because in Ghana health centres and clinics have some level of control over inputs than outputs [19]. The VRS approach helped determine whether a DMU’s production exhibits increasing returns to scale, constant returns to scale or decreasing returns to scale.

The DEA is a nonparametric statistical test that has been used as a standard method to estimate technical efficiency within and outside Ghana because of some advantages over the stochastic frontiers [4,19,20]. The technical efficiency score of each clinic and health centre was attained by solving models 1 and 2 below as presented in a similar study by Osei et al. [20].

**DEA weights model 1: input-orientated, CRS**

$$\text{Eff} = \max \sum u_i y_{ij0}$$

subject to

$$\sum u_i y_{ij} - \sum v_j x_{ij0} s_0 \leq 0 \quad ; \forall j$$

$$\sum v_j x_{ij0} = 1$$

$$u_i, v_j \geq 0 \quad ; \forall i, j,$$

Where:

- $u_i = \text{the weight given to output } i$ ($r = 1, \ldots, t$ and $t$ is the number of outputs),
- $v_j = \text{the weight given to input } i$ ($r = 1, \ldots, m$ and $m$ is the number of inputs),
- $n = \text{the number of clinics or health centres}$
- $j = \text{the number of clinics or health centres under assessment}$

**DEA weights model 2: input-orientated, VRS**

$$\text{Eff} = \max \sum u_i y_{ij0} - v_j$$

subject to

$$\sum u_i y_{ij} - \sum v_j x_{ij0} s_0 \leq 0 \quad ; \forall j$$

$$\sum v_j x_{ij0} = 1$$

$$u_i, v_j \geq 0 \quad ; \forall i, j.$$

Advantages of the DEA

The DEA approach to frontier estimation has been argued to accommodate multiple inputs and outputs in a single measure of efficiency unlike the Stochastic Frontier Analysis (SFA) which cannot [29,30]. Unlike the parametric frontier models, the DEA does not suffer from the problem of model mis-specification which could possibly present misleading results, Charnes et al. [30]. Furthermore, Akazili et al. [19] argued that the DEA does not suffer from problems of multicollinearity and heteroscedasticity as seen in SFA.

Limitations of the DEA

The DEA model potentially justifies inefficiency in DMUs since a DMU can be efficient among its peers but actually be inefficient in absolute terms [19,28]. Secondly, since the DEA is not a parametric statistical method, hypothesis testing could be a challenge [19]. The DEA is primarily a diagnostic tool and does not necessarily prescribe strategies to make inefficient firms efficient. These limitations can however be controlled with large sample size representative of the population and use of complementary analysis such as Tobit regression [31].

Data analysis and rationale for selecting inputs and outputs

Data analysis was done at two levels. The first level used the Data Envelopment Analysis Programme (DEAP) version 2.1 to estimate the technical efficiency scores of the 64 facilities based on five (5) inputs and four (4) outputs. These input and output factors were considered because of their relevance to primary healthcare which is the main focus and preoccupation of sampled clinics and health centres. These factors were also selected because of their relevance in attainment of the health-related MDGs in Ghana. Moreover, there was adequate data on these input and output factors in the sampled health facilities. The number of inputs ($n = 5$) and outputs ($n = 4$) used for the DEA is also consistent with approaches by previous related studies [4,18-20] to avoid extreme trade-off between estimated efficiency and number of inputs and outputs used.

Another criteria used for the inputs selection was their relevance to clinic/health centre settings. Because clinics/health centres are smaller in size and scope, observation beds, wards (mainly for observing basic medical conditions for less than 24 hours and referred if complicated), consulting rooms, clinical and support staff were considered for the DEA; the selection criteria would have been different if the facilities were secondary or tertiary hospitals. Since clinics and health centres at the primary healthcare level do not render inpatient services and other complex healthcare services, only relevant output factors such as number of spontaneous vaginal deliveries (SVDs), outpatient attendance, number of antenatal, postnatal, and reproductive services were considered. The input and output factors were thus carefully selected to reflect the capacity and
The second level of analysis was a Tobit regression and Spearman rank correlation analysis using STATA (version 12.0) to predict factors associated with efficiency levels in health facilities. Advantages of using Tobit regression over other approaches have been indicated in Long [31]. For instance, when variables are censored, Tobit regression is able to provide better consistent estimates of the parameters than the truncated regression. The dependent variable of interest for the Tobit regression was technical efficiency score of health facilities which was right-censored using the upper limit of 1.0 (equivalent to 100%), thus facilities that fall below this limit were deemed inefficient relative to their peers.

The independent variable of interest was facility ownership which was categorized into “private-for-profit”, “public/government” and “mission/NGO”. Control variables in the regression model were health facility rural-urban location, gender of health facility manager/owner, and presence of complaint system. These control variables were intuitively selected because of their potential effect on administrative effectiveness or otherwise which in turn could influence facility efficiency levels. The Tobit regression was modelled as follows using maximum likelihood, assuming homoskedastic normal disturbances:

$$\text{Tobit}(y_j) = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \ldots + \epsilon_j$$

Where: $y_j$ is the constant returns to scale efficiency score for the $j$th health facility, $x_j$ are the independent variables, $\alpha$ is the coefficient and $\epsilon_j$ are the disturbance term assumed to be normally distributed with the $\mu$ mean and standard deviation $\sigma$. Multicollinearity diagnostics was performed for all explanatory variables prior to their inclusion in the regression model and none had a variance inflation factor (VIF) up to the 10.0 rule of thumb necessary for exclusion [32].

Spearman rank correlation test was performed to ascertain the association between technical efficiency scores and quality healthcare proxies using the NHIA five core standard areas and the SafeCare Essentials patient risk areas. The pair-wise correlation coefficients were determined at 95% confidence level.

For the purposes of this paper, quality healthcare was determined using the NHIA accreditation SafeCare Essentials tool comprises of 41 assessment criteria categorized into five risk areas, namely: leadership and accountability (7 criteria); competent and capable workforce (7 criteria); safe environment for staff and patients (10 criteria); clinical care of patients (10 criteria) and improvement of quality and safety (7 criteria). Each assessment criteria is scored on a four-point scale (0-3) called levels of effort. High levels depict better efforts by staff of pertinent health facility towards enhancing patient safety and reducing risk (see Alhassan et al. [26]).

### RESULTS

#### Characteristics of health facilities

All 64 clinics and health centres fully participated in the study representing a return rate of 100%. As shown in Table 1, nearly 50% of the health facilities were private-for-profit; 41% were public/government owned and 12% were mission/NGO facilities. Close to 60% of the facilities were located in rural areas; 55% were either owned or managed by males; 55% did not receive any form of donor funding support; 78% had no functional computers in place and 92% had no active complaint systems for clients.

On the average, there were more clinical staff (mean = 16, SD = 14) than support staff (mean = 8, SD = 9) per health facility. The average number of observation beds in a health facility was 11 (SD = 10) while the average number of wards and consulting rooms per health facility was 2. The dominant service rendered was outpatient visits (mean = 1,011, SD = 787) followed by antenatal (ANC)/postnatal (PNC) visits (mean = 512, SD = 712) and family planning (FP)/reproductive care and child health (RCH) visits (mean = 208, SD = 355); the number of SVDs per month per health facility was 13 (SD = 16) (see Table 2). Public and private facilities did not significantly differ in their inputs and outputs records, apart from private facilities having one more ward and public facilities doing more SVDs (19, versus 9), recording more ANC/PNC visits (798, versus 317) and FP/RCH visits (429 versus 56) (see Table 2).
The DEA results showed that the average technical efficiency score for the 64 facilities was 0.65 (i.e., in percentage terms 35% efficiency) and that 20 facilities (31%) attained the 1.0 optimal efficiency level. The remaining 44 (69%) attained scores below 1.0. The lowest efficiency score was 0.11 attained by one health facility (see Figure 1). Out of the 20 facilities that attained 1.0 efficiency, 2 (10%) were mission/NGO; 8 (40%) were private-for-profit; 10 (50%) were public/government.

In terms of the regions, 4 out of the 20 efficient facilities were located in GAR while 16 (80%) were in WR; 60% of the efficient facilities were rural-based and the remaining 40% were urban-based.

Table 2: Human and material resources in health facilities

<table>
<thead>
<tr>
<th>Input and output variables</th>
<th>Efficiency score</th>
<th>Facility ownership</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0 (n = 20)</td>
<td>&lt;1.0 (n = 44)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Number of clinical staff</td>
<td>11(7)</td>
<td>19 (16)</td>
<td>0.0509</td>
</tr>
<tr>
<td>Number of support staff</td>
<td>4 (4)</td>
<td>9 (11)</td>
<td>0.0426*</td>
</tr>
<tr>
<td>Number of beds</td>
<td>9 (8)</td>
<td>11 (11)</td>
<td>0.4011</td>
</tr>
<tr>
<td>Number of wards</td>
<td>2 (1)</td>
<td>2 (1)</td>
<td>0.3330</td>
</tr>
<tr>
<td>Number of consulting rooms</td>
<td>1 (0.3)</td>
<td>2 (1)</td>
<td>0.0177*</td>
</tr>
</tbody>
</table>

Output variables (per month)

| Number of deliveries | 17 (20) | 11 (15) | 0.1819 | 9(15) | 19(17) | 0.0115* | 13(16) | 13(16) | 0.1819 | 9(15) | 19(17) | 0.0115* |
| Number of OPD visits | 1,197 (732) | 927 (805) | 0.2054 | 1,047(880) | 958(665) | 0.6583 | 1,011(787) | 1,011(787) | 0.2054 | 1,047(880) | 958(665) | 0.6583 |
| Number of ANC/PNC visits | 677 (956) | 437 (567) | 0.2138 | 317(657) | 798(705) | 0.0069* | 512 | 512 | 0.2138 | 317(657) | 798(705) | 0.0069* |
| Number of FP and RCH visits | 321 (480) | 156 (273) | 0.0841 | 56(129) | 429(456) | 0.0000* | 208(355) | 208(355) | 0.0841 | 56(129) | 429(456) | 0.0000* |

Source: WOTRO-COHEiSION Ghana Project (Health Facility Survey Data: March-June, 2012)

Legend: FP: Family planning; RCH: Reproductive and Child Health; OPD: Out-patient department; ANC: Antenatal care; PNC: Postnatal care

*Two-tailed test of hypothesis statistically significant at 95% confidence level using the Student t-test

**Ownership is dichotomized for the t-test where government and quasi-government facilities are classified under “public” and private-for-profit and Mission/NGO health facilities classified under “private”
On the whole, health facilities that attained efficiency scores below the 1.0 efficiency benchmark used excess (surplus) human and material resources but recorded lesser health service activities such as number of SVDs, and outpatient attendance per month. Conversely, health facilities that operated at 1.0 efficiency level had lesser number of clinical staff, support staff, beds and wards though recorded more SVDs, ANC/PNC visits and FP/RCH visits than their inefficient counterparts (P < 0.05) (see Table 2). The results also showed that lower efficiency scores were recorded by many urban health facilities while many rural facilities recorded higher efficiency scores (P < 0.0001) (see Figure 3). The beds and wards were mainly for observation and primary healthcare services since clinics and health centres (especially public/government owned) do not typically render complex inpatient services. All output factors were thus recorded based on mainstream primary healthcare services.

Table 3 depicts the constant returns to scale (CRS) and the variable returns to scale (VRS) values according to facility ownership. The CRS values are the average efficiency scores while the VRS figures depict the average input excesses that need to be reduced or output targets required to enhance efficiency levels in inefficient facilities. The mean VRS irrespective of facility ownership was 84%, indicating that 16% of input reduction or 84% output increase is needed for attaining...
the 1.0 optimal efficiency benchmark. Based on facility ownership, inefficient private-for-profit and mission/NGO facilities will need up to 13% input reduction or 87% output increases to enhance their efficiency level, given their available material and human resources. Inefficient public/government facilities will need inputs cuts up to 19% or outputs increases of about 81% to make them efficient considering their available health resources (see Table 3).

Table 3: Average inputs reductions or outputs increases based on facility ownership

<table>
<thead>
<tr>
<th>Facility ownership</th>
<th>Constant returns to scale (CRS)</th>
<th>Variable returns to scale (VRS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (%)</td>
<td>Std. Dev (%)</td>
</tr>
<tr>
<td>Private-for-profit</td>
<td>58%</td>
<td>33%</td>
</tr>
<tr>
<td>Public/government</td>
<td>71%</td>
<td>30%</td>
</tr>
<tr>
<td>Mission/NGO</td>
<td>73%</td>
<td>29%</td>
</tr>
<tr>
<td>Total (n=64)</td>
<td>65%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHESION Ghana Project (Health Facility Survey Data: March-June, 2012)

Legend: Constant Returns to Scale (CRS): depict the average efficiency scores by the health facilities based on ownership; Variable Returns to Scale (VRS): depict the average input excesses that need to be reduced or output targets to make inefficient facilities efficient.

Furthermore, the results showed that each of the health facilities that did not attain optimal efficiency levels will need an average reduction of 9 clinical staff; 3 non-clinical staff; 5 beds; 1 consulting room and, 1 ward from their current assets endowment to make them more efficient. Alternatively, these individual facilities in maintaining their current assets will approximately need to increase their output in SVDs to 14, outpatient visits to 1,086, ANC/PNC visits to 693, and FP/RCH visits to 308 to make them more efficient (see Figure 4).

Factors associated with health facility efficiency

As shown in Table 4, facility ownership is significantly associated with technical efficiency levels in health facilities. Higher efficiency scores were particularly associated with public/government facilities and Mission/NGO facilities located in WR than those in GAR (P <0.05). Control variables such as gender of facility owner/manager, presence of complaint systems, access to donor funding, and rural-urban location did not have significant relationship with efficiency levels.

Finally, the results showed that many of the quality healthcare proxies had no significant association with technical efficiency (P >0.05); thus, high efficiency levels did not necessarily associate with better quality healthcare standards in sampled health facilities and vice versa. Technical efficiency was only significantly associated with one SafeCare Essentials risk area (Coef. = -0.2764, P <0.05) and the overall NHIA quality assessment score (Coef. = -0.3158, P <0.05) (see Table 5).

Table 4: Factors associated with technical efficiency levels in health facilities (n = 64)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Coef.</th>
<th>P-value</th>
<th>Technical efficiency scoreβ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>[95% Conf.</td>
</tr>
<tr>
<td>Public/government facilities (WR)</td>
<td>42.9</td>
<td>0.001*</td>
<td>16.9</td>
</tr>
<tr>
<td>Public/government facilities (GAR)</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Mission/NGO facilities (WR)</td>
<td>52.1</td>
<td>0.000*</td>
<td>24.6</td>
</tr>
<tr>
<td>Mission/NGO facilities (GAR)</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Private-for-profit facilities (WR)</td>
<td>26.3</td>
<td>0.005</td>
<td>-3.8</td>
</tr>
<tr>
<td>Private-for-profit facilities (GAR)</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Rural facilities</td>
<td>3.87</td>
<td>0.680</td>
<td>-14.9</td>
</tr>
<tr>
<td>Urban facilities</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Facilities owned/managed by male</td>
<td>-2.03</td>
<td>0.846</td>
<td>-22.8</td>
</tr>
<tr>
<td>Facilities owned/managed by female</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Facilities with access to donor funding</td>
<td>6.79</td>
<td>0.589</td>
<td>-18.3</td>
</tr>
<tr>
<td>Facilities without access to donor funding</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
<tr>
<td>Facilities with active client complaint system</td>
<td>1.12</td>
<td>0.953</td>
<td>-36.4</td>
</tr>
<tr>
<td>Facilities without active client complaint system</td>
<td>Ref</td>
<td>Ref</td>
<td></td>
</tr>
</tbody>
</table>

Log Likelihood = -232.58405

Prob> Chi2 = 0.0006

Pseudo R2 = 0.0524

Source: WOTRO-COHESION Ghana Project (Health Facility Survey Data: March-June, 2012)

βDependent variable (technical efficiency % score) right-censored at 1.0 (equivalent to 100%), benchmark for technically efficient facilities. Facilities scoring below 1.0 are considered inefficient;

Legend: Greater Accra Region (GAR); WR (Western Region)

*Statistically significant at 0.05 level of significance
Chapter 4

Overall score -0.1912
Quality improvement -0.0421
Clinical care -0.1318
Environmental safety -0.2764
Leadership and accountability -0.0834

patient risk areas
SafeCare Essentials

<table>
<thead>
<tr>
<th>NHIA core standard areas</th>
<th>Technical efficiency score</th>
<th>Coef.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range of services</td>
<td>-0.1416</td>
<td></td>
</tr>
<tr>
<td>Staffing</td>
<td>-0.0522</td>
<td></td>
</tr>
<tr>
<td>Organisation and management</td>
<td>-0.1370</td>
<td></td>
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<tr>
<td>Quality and safety management</td>
<td>-0.1431</td>
<td></td>
</tr>
<tr>
<td>Care delivery</td>
<td>-0.1946</td>
<td></td>
</tr>
<tr>
<td>Overall score</td>
<td>-0.3158*</td>
<td></td>
</tr>
</tbody>
</table>

SafeCare Essentials patient risk areas

Leadership and accountability -0.0834
Competency of workforce 0.0055
Environmental safety -0.2764
Clinical care -0.1318
Quality improvement -0.0421
Overall score -0.1912

Source: WOTRO-COHESION Ghana Project (Health Facility Survey Data: March-June, 2012)
Note: Quality healthcare proxies represent the health facilities performance in adherence to patient safety and standard quality health service delivery protocols. Higher scores depict better efforts and adherence to these standard protocols and vice-versa.
*Spearman rank correlation statistically significant at 0.05 level of significance (unadjusted Bonferroni or Sidak)

DISCUSSION

This study found that approximately 31% of the 64 sampled facilities were operating more efficiently relative to their peers. Even though several factors might account for this outcome, the efficiency scores distribution could have been skewed by the dominance of rural facilities (n = 36) in the study sample. Since majority of the rural clinics and health centres are less endowed with material and human resources but record huge clinic attendance (see Table 2), it is expected that a preponderance of them will be deemed efficient because the DEA estimations are based on weighted sum of service output divided by weighted sum of inputs (resources). Thus, the higher the outputs over inputs the higher the efficiency score and vice versa. Majority (80%) of the efficient facilities were in the Western region which is largely rural while the remaining 20% were in the Greater Accra.

Furthermore, the distribution of efficiency scores (see Figure 1) could be attributed to the purposive sampling of primary healthcare facilities for this study. Primary facilities, being the frontier of healthcare and often located in rural areas are likely to be overcrowded and thus score higher on DEA scales. Technical efficiency scores in higher level facilities such as hospitals are likely to be significantly different from results of this study.

Findings of previous studies on technical efficiency in Ghana corroborate the results of this current study demonstrating the high levels of inefficiencies in healthcare facilities. Previous findings on Ghana showed that 35% of 89 health facilities and 22% of 113 health centres were optimally efficient [18,19]. Other studies on technical efficiency in Ghana [4,20] and some African countries [21-23,25] found that less than 50% of surveyed health facilities were efficient. While acknowledging the limitations associated with the DEA approach, conclusions in this paper are motivated by the widely recognised advantages of the DEA approach over other options [4,20,30].

Conclusions on technical efficiency levels in private and public health facilities vary in the literature depending on the methodology used and study setting. This study found that out of the 20 efficient facilities, 10 (50%) were Public/government owned; 8 (40%) were Private-for-profit, and 2 (10%) were Mission/NGO facilities. In relative terms, this suggests lower levels of efficiency in mission/NGO and private-for-profit health facilities than public/government facilities. It was also found that higher efficiency scores were associated with public/government and Mission/NGO facilities in WR relative to those located in GAR (P <0.05) (see Table 4). This suggests that the administrative region in which a private or public facility operates potentially associates with efficiency levels; however, concrete conclusions cannot be drawn in this paper because more detailed information on other vital performance indicators was not explored.

In terms facility ownership, the mean variable returns to scale (VRS) values showed that private-for-profit health facilities operating below the 1.0(100%) efficiency benchmark could improve their efficiency levels by increasing outputs to about 87%. This observation is in contrast with findings of previous studies which indicated that private-for-profit health facilities are more efficient in health service delivery than public health facilities [33]. A more recent study by Jehu-Appiah et al. [4] however confirm our findings. Jehu-Appiah et al. [4] compared technical efficiency levels in public/government, private-for-profit, mission and quasi-government facilities in Ghana and found that efficiency scores were relatively lower in private-for-profit facilities. Quasi-government facilities recorded higher efficiency scores followed by public/government and mission facilities.

A similar study by Akau et al. [18] found that 65% of 89 public health centres were inefficient relative to their peers, but no direct comparison was made with private-for-profit facilities. After conducting a meta-analysis of 317 publications on technical efficiency, Hollingsworth and Wildman [34] concluded that public facilities could potentially be more efficient in health service delivery than private-for-profit facilities.

Though the current study did not explore direct reasons for these differences in efficiency levels, a probable explanation would be that most private-for-profit facilities are located in urban areas and better endowed with material and human resources which could result in redundancy and under-utilization of excess available resources. Over 60% of NHS-accredited private facilities are located in the two most urbanized cities in Ghana (Accra and Kumasi) [15]. This study observed that even though private facilities generally had more clinical staff, support staff, beds and wards than their public counterparts, output in terms of monthly SVDs, antenatal, postnatal, and reproductive health visits were lower, suggesting some level of redundancy in the service delivery system.
Given the increasing preferences for private health facilities over public due to perceived better quality in the former [35-37], the private sector has a competitive advantage over the public to maximize profit by instilling waste reduction strategies in the service delivery process. With the introduction of the NHIS, private-for-profit health facilities have opportunities to expand service coverage and improve efficiency levels because insured clients can access healthcare without considering the cost, a phenomenon that previously resulted in lower outpatient attendance in private-for-profit facilities [4].

Moreover, since input decreases by transfer of human and material resources from inefficient private-for-profit facilities to public/government facilities might not be a realistic intervention, output increases through outreach services and client-focused activities will be potentially more appropriate. Continuous quality healthcare improvement by private-for-profit facilities will attract and retain clients and ultimately increase their customer base and reduce redundancies.

In addition, through effective public-private-partnership (PPP), the Ministry of Health (MoH), Ghana Health Service (GHS) and the NHIA could collaborate with private-for-profit facilities that are better endowed in material and human resources to render referral services to clients from public facilities. This form of agreement could help private facilities maximize available resources and reduce burden on public facilities. Some form of collaboration already exists where immunizations and other forms of child welfare services are done by GHS staff in private facilities on selected days. This partnership could be extended to include other service areas especially in communities where a private-for-profit facility is the sole source of healthcare. The MoH currently supports mission/NGO facilities by paying salaries of health staff on secondment by the GHS and this could be discussed for possible replication for private-for-profit facilities. This will promote the financial viability of private facilities and motivate them to extend services to rural areas and expand their scope of healthcare delivery.

In the case of inefficient public/government facilities, since closure will not be a practical intervention, downsizing could be done by transferring excess staff to other public facilities with staff shortage. Likewise, clinic beds could be relocated or expansion projects diverted to facilities in greater need. These actions could help reduce inefficiency disparities and promote universal access to basic health services. However, these interventions should be preceded by comprehensive analysis of the quality healthcare situation in these facilities in order not to compromise quality health service delivery emanating from inputs reductions.

This study found that technical efficiency did not significantly correlate with many quality healthcare proxies per the NHIA and the SafeCare Essentials assessment tool. This suggests the need to exercise a fair balance between quality healthcare and efficiency in health facilities since the optimal presence of one might not necessarily guarantee the existence of the other. Mainly improving efficiency levels without corresponding quality improvement plans could compromise quality healthcare and render high efficiency gains meaningless. It is therefore important that these two components are equally emphasized.

The need to maintain a balance between quality and efficiency in NHIS-accredited health facilities is particularly vital because sacrificing one for the other could result in clients’ dissatisfaction with service quality leading to low confidence in the formal healthcare system.

Results of the Spearman correlation test puts into perspective the technical efficiency performance of the sampled health facilities; the negative correlation between technical efficiency and overall NHIA assessment score (Coef. = -0.3158, P <0.05) imply that quality healthcare standards could have been compromised in health facilities deemed technically efficient because of limited material and human resources.

Even though there is sometimes a trade-off between quality healthcare and efficiency, the scope of this paper did not include a quality-adjusted DEA analysis. In the light of this, future research endeavours could incorporate quality healthcare markers into DEA analysis to help policy makers identify and manage facilities that are: efficient with high quality; efficient with low quality; inefficient with high quality, and inefficient with low quality.

The policy recommendations proposed in this paper should be adequately juxtaposed with the quality standards in the pertinent health facilities. Health facilities deemed inefficient but provide better quality healthcare might not necessarily have to reduce their input factors because that could compromise quality healthcare standards. Instead, strategies to increase service output (i.e. outreach services, client-focused activities and health education) could be intensified to reduce redundancies.

Inefficient health facilities with low quality healthcare standards might need more comprehensive interventions that involve internal reshuffling of redundant resources, increment in service output, staff capacity building on efficient utilization of resources, and effective implementation of quality improvement plans. Even though inefficient facilities theoretically have to reduce inputs and increase service output to attain optimal efficiency, if such facilities maintain acceptable quality healthcare standards there might not be the need to reduce input factors since that could practically compromise quality healthcare delivery.

Overall, the prominent message of this paper is that significant benefits, including cost savings, could be made by the NHIA and the MoH at large if accredited facilities operate more efficiently while maintaining acceptable quality healthcare standards. The NHIA claims payment trend show that total claims payment rose from approximately US$8 million in the year 2005 to over US$300 million in 2012 [5]. This unsustainable trend could be controlled if NHIS-accredited service providers operate more efficiently without compromising good quality healthcare standards.

Key objectives of the capitation system being planned for nationwide roll-out by the NHIA include improvement in cost containment and sustainability of the NHIS through enhanced efficiency, quality healthcare and more rational use of resources [5]. To accomplish these objectives and more, the NHIA and its stakeholders are encouraged to prioritize efficiency in quality healthcare delivery on their policy agenda with particular attention to urban healthcare facilities where efficiency levels were relatively lower.

**Limitations**

This study focused on only NHIS-accredited clinics and health centres thus possibly losing out valuable information on non-accredited health facilities. In addition, the study was conducted in two (2) out of ten (10) regions in Ghana engaging only 64 out of over 1,000 accredited clinics and health centres nationwide. Extrapolation of the findings to other regions could therefore be
a challenge. Finally, the study did not exhaust the entire concept of efficiency since only technical efficiency was assessed. Allocative efficiency was not measured because of limited data on revenue and cost of services in the 64 facilities.

**Conclusion**

Out of the 64 sampled facilities, 20 (31%) attained the 100% efficiency benchmark; many Public/government facilities were found to be more efficient than private-for-profit and mission/NGO facilities. Even though this percentage might not necessarily reflect the absolute efficiency performance of health facilities in Ghana, the findings are relevant to inform policy on effective allocation, distribution and utilization of available health sector resources without compromising quality healthcare standards. Ultimate policy decisions on inputs reductions and/or output increases in inefficient health facilities should be informed by reality checks on quality healthcare standards in health facilities. This will avoid worsening quality healthcare standards in the pursuit for high efficiency levels in health facilities.

High levels of inefficiencies and poor quality healthcare standards in accredited health facilities could have dire consequences on the operational and financial sustainability of Ghana’s NHIS hence the need to prioritize technical efficiency as an NHIS sustainability strategy. Perpetual inefficient management of limited resources coupled with poor quality healthcare has the tendency to worsen existing challenges in attaining universal access to basic healthcare. Findings of this study are expected to kindle policy discourses on the need to complement quality improvement efforts with structured technical efficiency assessment in health facilities, including NHIS-accredited facilities.

**Policy implications/highlights**

- **Commitment to equitable allocation and distribution of health resources:** National policies aimed at bridging development gaps between rural and urban regions could help attract and retain qualified personnel in rural regions and reduce redundancies in urban-based health facilities which were found to be predominantly inefficient in this study. Comprehensive situational analysis of health needs in rural and urban areas will help attain equity in resource allocation.

- **Motivation for health workers in deprived areas:** Another key intervention to improve efficiency will be re-designing of provider level incentives (not necessarily monetary) to attract and retain qualified health personnel in deprived regions where their services are most needed. Effective health worker incentives will not only contribute to quality improvement but also ensure efficient operation of health facilities. Effective incentive systems in the forms of staff accommodation, transportation and career development opportunities could help improve health worker density in less endowed regions and promote universal access to quality service delivery.

- **Improved client-centred healthcare system:** Intensified public health education activities, client-centred strategies, quality healthcare, and outreach campaigns could go a long way to increase output activities and reduce redundancies.

- **Integration of efficiency assessment into mainstream monitoring and peer reviews:** As part of the NHA routine support to health facilities to improve performance, comprehensive technical efficiency assessment should be instituted in collaboration with the GHS, Society of Private Medical and Dental Practitioners (SPMDP), the Christian Health Association of Ghana (CHAG) and other religious bodies. This will help identify and assist inefficient health facilities re-allocate excess resources or increase service activities to instil efficiency in health service delivery. Likewise, best practices in efficient facilities could be learnt by their peers through joint peer-review activities.

- **Adopting technical efficiency as part of accreditation requirements:** Future revision of the NHA accreditation tools could incorporate mainstream technical efficiency variables to form part of the requirement for accreditation. This will encourage health facilities to strive for efficiency in their operations and still maintain acceptable quality healthcare standards.

**Acknowledgement/Funding**

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PART 2

Post interventions studies
CHAPTER 5

Effect of community engagement interventions on patient safety and risk reduction efforts in primary health facilities: evidence from Ghana

Robert Kaba Alhassan, Edward Nketiah-Amponsah, Nicole Spieker, Daniel Kojo Arhinful, Alice Œgink, Paul van Ostenberg, and Tobias F. Rinke de Wit

ABSTRACT

Background
Patient safety and quality healthcare remain major challenges to Ghana’s healthcare system. Like many health systems in Africa, this is largely because demand for healthcare is outstripping available human and material resource capacity of healthcare facilities and new investment is insufficient. In the light of these demands and supply constraints, systematic community engagement (SCE) in healthcare quality assessment can be a feasible and cost-effective option to augment existing quality improvement interventions. SCE entails structured use of existing community groups to assess healthcare quality in health facilities. Identified quality gaps are discussed with healthcare providers, improvements identified and rewards provided if the quality gaps are closed.

Purpose
This paper evaluates whether or not SCE, through the assessment of health service quality, improves patient safety and risk reduction efforts by staff in healthcare facilities.

Methods
A randomized control trial was conducted in 64 primary healthcare facilities in the Greater Accra and Western regions of Ghana. Patient risk assessments were conducted in 32 randomly assigned intervention and control facilities. Multivariate multiple regression test was used to determine the effect of the SCE interventions on staff efforts towards reducing patient risk. Spearman correlation test was used to ascertain associations between types of community groups engaged and risk assessment scores of healthcare facilities.

Findings
Clinic staff efforts towards increasing patient safety and reducing risk improved significantly in intervention facilities especially in the areas of leadership/accountability (Coef. = 10.4, P < 0.05) and staff competencies (Coef. = 7.1, P < 0.05). Improvement in service utilization and health resources could not be attributed to the interventions because these were outside the control of the study and might have been influenced by institutional or national level developments between the baseline and follow-up period. Community groups that were gender balanced, religious/faith-based, and had structured leadership appeared to be better options for effective SCE in healthcare quality assessment.

Conclusion
Community engagement in healthcare quality assessment is a feasible client-centred quality improvement option that should be discussed for possible scale-up in Ghana and other resource poor countries in Africa.

INTRODUCTION

Patient safety and quality healthcare are critical dimensions of universal health coverage (UHC) yet remain complex challenges to health systems globally [1]. Since the launch of the World Health Organisation (WHO) Patient Safety Programme (PSP) in 2004, over 140 countries globally (including Ghana) agreed to intensify efforts towards addressing challenges relating to unsafe and poor quality healthcare through established science-based systems.

Although patient safety and patient-centred care are recognised as important requirements for meeting patient needs [2,3], achievements in this regard remain modest especially in resource constrained countries in sub-Saharan Africa (SSA). In the light of these resource constraints, it is imperative that available community resources are harnessed through systematic community engagement (SCE) to complement central government’s efforts towards quality healthcare improvement [4,5,6]. Community engagement in health has proved effective in empowering communities/clients, harnessing local resources, enhancing service provider accountability and experiences of clients with healthcare providers [7-11].

Morgan and Lifshay [12] defined community engagement in the context of public health as dynamic relationships and dialogue between community members and local health professionals with varying degrees of community and higher level health authorities’ involvement in decision-making and control. In the context of this study, SCE is defined as structured involvement of existing community groups and associations in monitoring service quality and engaging with relevant stakeholders on a common platform towards addressing identified quality healthcare gaps.

Even though community engagement in health is not an entirely new concept in Ghana [7,11,13-15] it is yet to be adopted as a quality improvement strategy. Limitations of conventional quality assessment methods such as patient satisfaction surveys, institutional peer reviews, exit interviews and mystery client shopping [16-20] demand that complementary strategies such SCE in quality healthcare assessment are explored. Unlike the conventional methods, SCE is more community-focused, less technical, and potentially less expensive with higher sustainability prospects because it is mainly championed by community members and resources largely mobilized from within the community.

The SCE interventions, evaluated in this paper, were designed to systematically engage existing community groups and associations in assessing healthcare quality in health facilities accredited by the National Health Insurance Authority (NHIA) in Ghana. The NHIA is the regulatory body under the Ministry of Health (MoH) responsible for accreditation of health facilities willing to render services to subscribers of Ghana’s National Health Insurance Scheme (NHIS).

This paper evaluates impact of the SCE interventions on patient safety and risk reduction efforts (i.e. proxies for healthcare quality indicators) in the intervention health facilities. The main research hypothesis is that patient safety and risk reduction efforts will improve significantly in facilities that received the SCE interventions than those that did not, controlling for facility human/material resource capacity, location and ownership. Policy implications of the evaluation outcome are also discussed.
METHODOLOGY

Study design and setting
A Randomized Controlled Trial (RCT) was conducted in 64 NHIS-accredited clinics/health centres in the Greater (n = 32) and Western (n = 32) regions of Ghana. RCT was deemed appropriate for this study because it is one of the most scientifically rigorous methods of hypothesis testing [21] and the gold standard trial for evaluating effectiveness of interventions while preventing selection bias [22,23].

Randomization and Sampling procedure
The sample frame was primary healthcare facilities (i.e. clinics and health centres) accredited by the NHIA. Clinics/health centres were sampled because they are relatively less complex and could easily be monitored for impact of the implemented interventions. A total of 16 NHIS district offices (used as proxy administrative districts) were sampled at random (i.e. 8 from each region); next, four (4) health facilities around the catchment area of each NHIS district office were also randomly sampled. In each of the study regions, 16 health facilities were randomly assigned to receive treatment (i.e. SCE) and another 16 assigned as controls (i.e. no SCE). Random allocation of the health facilities into the intervention and control arms of the project was conducted such that in each district, the names of all 4 health facilities were written on pieces of paper. Subsequently, for each district at a time, two ballots (representing health facilities) were randomly picked without replacement to receive intervention. Per this criteria 32 health facilities and their catchment area were randomly assigned as intervention facilities and the remaining 32 as controls (see details of the SCE design in Chapter 7).

Statistical power and representativeness of the study
The sample size of 64 clinics is deemed representative because the number was determined by 80% statistical power calculation needed to attain up to 1,920 households and over 9,000 individuals around the catchment area of these 64 clinics. This statistical power is required to determine true effect of implemented interventions and increase the probability that the study correctly rejects the null hypothesis (H0) that the SCE interventions had no significant effect on any of the healthcare quality proxies (i.e. 5 risk areas) [24]. Moreover, the 64 facilities constitute about 5% of the approximately 1,180 accredited clinics/health centres in Ghana while the 32 intervention facilities represent about 10% of the total number of accredited clinics/health centres in each of the two study regions [25].

Implementation of the Systematic Community Engagement (SCE) Interventions
The SCE interventions were implemented for nearly one year (from June, 2013 to March, 2014). Two categories of SCE were implemented namely: MyCare (also called Intensive Engagement) and Light Engagement (LE). The LE intervention used existing community groups/associations to identify service delivery gaps in healthcare facilities and NHIS district offices. The MyCare component engaged clients and relevant stakeholders in a participatory process; the focus was on individual clients contrary to the group approach in the LE. Both categories of interventions were implemented and evaluated concurrently.

This paper emphasizes the LE arm of the SCE because the MyCare intervention was implemented in only 6 out of the 32 intervention facilities; moreover facilities where MyCare was implemented, the LE component was also implemented. In this paper, the SCE thus refers specifically to the LE interventions.

Light Engagement implementation steps
Step 1: The first step involved recruitment and training of 52 facilitators, and identification of existing community groups/associations. One facilitator was assigned to each of the 52 community groups in the two study regions (26 in each region).

Eligibility criteria for selection of community groups included: (i) documented evidence of routine meetings (at least four times a year), (ii) regular meeting venue, (iii) clear leadership structure, (iv) non-partisan and (v) active membership not less than an intuitive number of ten (10). These criteria were meant to ensure the groups are active in their activities and reasonably represent cross-section of community opinion. Where more than two community groups around the catchment area of a health facility met these eligibility criteria, simple random sampling was done to select two groups to control bias.

Even though the types of community groups varied based on core activities, these features did not systematically relate to particular features of the sampled clinics. The five (5) eligibility criteria were used as the basis for selecting the community groups to avoid engaging groups that systematically share features with the clinics they assess. A pairwise correlation test confirmed that many community groups’ features did not significantly associate with clinic characteristics (see S1 Table).

The community groups recruited comprised of 22 religious/faith-based groups; 8 traders groups; 1 widows group; 3 community volunteers groups; 3 musician groups; 5 artisans groups and 11 youth groups. Average group size during assessment was 29 members (SD = 20). More than half of the groups were female dominated, 13 were male dominated; 2 were all males; 5 were all females, and 1 was balanced males and females. Approximately 56% of the groups were a combination of literates and illiterates; 23% were mainly literates, and 21% mainly illiterates. In terms of age, 65% of the groups had predominantly elderly members (31+ years) and 35% had predominantly youthful members (18-30 years).
S1 Table: Correlation between community groups’ characteristics and clinic features (n = 52)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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</tr>
</thead>
<tbody>
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<td>Group type</td>
<td>Owner-ship</td>
<td>0.1090</td>
<td>-0.2389</td>
<td>0.3851</td>
<td>-0.2184</td>
<td>-0.1218</td>
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<td>Gender distribution</td>
<td>Location</td>
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<td>0.0880</td>
<td>-0.0456</td>
<td>-0.1146</td>
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<td>Age distribution</td>
<td>Region</td>
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<td>0.1871</td>
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<td>0.1766</td>
<td>0.0075</td>
<td>0.1899</td>
</tr>
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<td>Education</td>
<td>No. consulting rooms</td>
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<td>-0.0477</td>
<td>0.1619</td>
<td>-0.3174</td>
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<tr>
<td>Leadership/Organisation</td>
<td>Laboratories</td>
<td>0.0642</td>
<td>0.1762</td>
<td>0.0444</td>
<td>0.1053</td>
<td>0.0808</td>
<td>-0.0528</td>
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<tr>
<td>Group size (mean = 29)</td>
<td>Staff:patient ratio</td>
<td>0.5660</td>
<td>-0.3307*</td>
<td>0.2318</td>
<td>0.1764</td>
<td>0.0241</td>
<td>-0.2752*</td>
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<tr>
<td>Attendance rate (mean = 60%)</td>
<td></td>
<td>-0.1029</td>
<td>0.2328</td>
<td>-0.0108</td>
<td>-0.1282</td>
<td>0.0062</td>
<td>0.0669</td>
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<tr>
<td>Meeting duration (mean = 41)</td>
<td></td>
<td>0.3219*</td>
<td>-0.2706</td>
<td>-0.0007</td>
<td>0.1911</td>
<td>-0.0292</td>
<td>0.1451</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEISSION Ghana Project (2014)

*Pairwise correlation test statistically significant (P < 0.05)

Step 2: The second engagement step entailed a first round of community group assessment of healthcare quality based on group members’ most recent (at most 6 months) experiences with the particular intervention health facility in their community. Healthcare quality proxies used to guide community members during assessment were: (1) staff attitude, (2) punctuality to work, (3) client waiting time, (4) queuing system, (5) availability of drugs, (6) information provision to clients, (7) equal treatment for insured and uninsured clients, (8) complaint system for clients, (9) client-provider communication, and (10) net promoter score (NPS). The NPS is an indicator used to determine the possibility of the healthcare client recommending the health facility to a fellow client (e.g. relative, friend or co-worker) based on their personal experiences of the quality of health service delivery. The rating is done on a five-point Likert scale from 1 = “Very disappointing” to 5 = “Very satisfactory”.

During engagement sessions, group members rated performance of their nearest health facility on these quality healthcare proxies on a five-point Likert scale from 1 = “Very disappointing” to 5 = “Very Satisfactory”. The group assessments were conducted in the communities to avoid possible bias and client intimidation. Anonymity of group members was assured by reporting group perception ratings without members’ personal details. The average meeting duration per group was 41 minutes (SD = 13.8).

Step 3: The third implementation step entailed regional level validation and feedback sessions to disseminate the group assessment findings with facility heads, clients and NHIA representatives. This platform provided the service providers the opportunity to recognise and accept gaps in healthcare quality and agree on quality improvement plans with timelines and responsible persons.

Step 4: During the fourth step, facilitators followed-up on the service providers (3 months after validation and feedback sessions) to ascertain whether or not providers were implementing the agreed action plans towards quality improvement.

Step 5: The last step rewarded best performing health facilities after a second round of community assessment (approximately six months after the first assessment). A citation plaque of honour and a token financial incentive of GHC 1,000.00 (Ghanaian Cedis), approximately US$ 280.0 was awarded to one best performing facility in a district to encourage competition among peers towards quality improvement (see S2 Fig).

S2 Figure: Systematic Community Engagement (SCE) implementation steps

Source: WOTRO-COHEISSION Ghana Project baseline and follow-up field data (2014); Legend: C=Client; P=Provider; I=Insure; NHIS (National Health Insurance Scheme); NHIA (National Health Insurance Authority)

Statistical analysis

Names of healthcare facilities sampled for the study were coded after data cleaning to ensure anonymity during data analysis. Parameters used to ascertain patient safety and risk status (i.e. healthcare quality proxies) were five primary risk areas defined in an assessment tool kit called SafeCare Essentials; 41 assessment criteria make up the five risk areas and each criteria is scored on four levels of effort (0-3) where high levels depict better efforts by staff of that pertinent health facility towards enhancing patient safety and reducing risk.

The five primary risk areas which are also the main outcome variables of interest are: leadership and accountability (7 criteria); competent and capable workforce (7 criteria); safe environment...
for staff and patients (10 criteria); clinical care of patients (10 criteria); and improvement of quality and safety (7 criteria) [26,27].

Before and after the SCE interventions, two trained research assistants did double scoring per healthcare facility and later reconciled scores using a Personal Device Assistant (PDA). Field data was then uploaded to a web-based platform called AfriDB for validation and approval by a PharmAccess quality assessment team in Amsterdam, Netherlands. The SafeCare Essentials tool is provided by the SafeCare Initiative, a collaboration of the PharmAccess Foundation, the Council for Health Services Accreditation of Southern Africa (COHSASA) and the Joint Commission International (JCI) [27].

The tool is designed to rapidly assess patient safety and risk status according to staff level of efforts. These levels of effort are not quality indicators per se but meant to ascertain whether patient safety activities in pertinent health facility were random and unsustainable when present or if there are sufficient structures and processes in place to attain its quality healthcare aspirations. The tool identifies the activities, behaviors, policies or processes that must be in place to score at the next higher level.

For the purposes of our analysis, mean percentage (%) scores were computed for each of the sampled health facilities based on their scores on the 41 criteria. For every health facility the mean % scores were computed by summing all applicable criteria scores (0-3) under each risk area divided by the total expected score per risk area and multiplied by 100. Thus if a health facility scores 3 in all 10 criteria under leadership and accountability, the mean% score for that risk area will be 30 (actual score) divided by 30 (total expected score) and multiplied by 100 (i.e. 100%). This computation is to ensure the outcome variables of interest (the five risk areas) are reported as continuous variables and are easy to interpret.

The SafeCare Essentials tool is deemed appropriate for the Ghanaian and African context because it has been validated in over 2,000 health facilities in Ghana, Nigeria, South Africa, Kenya, Mozambique and Namibia [28] prior to its application in this study.

All analyses were done on ‘intention to treat’ basis [22] and comparison of pre and post intervention quality scores was done using the paired t-test. Since the intervention and control health facilities were comparable in several respects per the RCT design, propensity score matching to estimate treatment effect was not relevant [22]. Instead, multivariate multiple regression analysis was performed to determine the effect of the SCE interventions on the five primary risk areas.

Covariates controlled for were: health facility material/human resource capacity, location (rural/urban) and ownership (private/public) following a multicollinearity test. Post estimation predictive margins and contrast tests were done to determine the interactive effect of variables on the five primary risk areas. Reported p-values are two-tailed test of hypothesis and P <0.1, P <0.05 or P <0.001 are considered statistically significant.

Spearman rank correlation test was used to ascertain the associations between the different types of community groups and assessment scores of health facilities on the five primary risk areas after the interventions. Statistical analyses were performed using Stata version 12.0 (StataCorp, College Station).

**Ethical clearance**

Ethical clearance for this study was sought from the Ghana Health Service (GHS) Ethical Review Committee (ERC) (Clearance number: GHS-ERC: 18/5/111). Moreover, written informed consent was sought from individual key informants, management of the healthcare facilities, district health directorates and district NHIA offices.

**RESULTS**

**Background information of health facilities**

Only facilities with complete follow-up and baseline data were included in the analysis for paired comparison purposes. One health facility in the control group in Greater Accra region was lost to follow-up in 2014 reducing the follow-up sample size to 63 (59% private and 41% public). The number of private health facilities that received intervention was 21 and 16 were controls; 11 public facilities received intervention and 15 were controls. In terms of facility geographic location, 18 rural facilities received intervention and 18 were controls; 14 urban facilities received intervention and 13 were controls.

As shown in Table 1 the average human and material resource situation per health facility appeared to have improved during the follow-up survey. Significant increases were recorded in the number of nurses, laboratory technologists, pharmacists and support staff (P <0.05); likewise, though the average number of wards and laboratories per clinic increased significantly at follow-up (P <0.05) these increases may not be associated with the interventions because they were not within the control of the study (see Figure 1).

The results also show that average health service utilization (i.e. number of client visits for health services) per health facility per month increased significantly between 2012 and 2014. Between 2012 and 2014, intervention facilities recorded significant increases in the average number of HIV tests in pregnancy per month (from 50 to 143; P = 0.0167) while control facilities recorded improvement in number of outpatient and inpatient visits per month (from 1,096 to 1,516; P = 0.0319). The average number of laboratory tests per clinic per month increased by over 97% in intervention facilities (from 10 to 390) compared to 93% in control facilities (from 58 to 803) (P <0.05); similarly, the number of malaria tests increased by approximately 98% in intervention facilities (from 6 to 265) compared to 92% in control facilities (from 29 to 375) (P <0.05) (see Figures 2 and 3).
Table 1: Background information of health facilities before and after interventions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. Clinics</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td></td>
<td>Staff +</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>Medical doctors</td>
<td>10</td>
<td>0.9(1.0)</td>
<td>1.0(1.0)</td>
</tr>
<tr>
<td>Medical assistants</td>
<td>50</td>
<td>0.5(0.5)</td>
<td>1.5(2.3)</td>
</tr>
<tr>
<td>Professional nurses</td>
<td>44</td>
<td>2.4(3.7)</td>
<td>8.4(10.7)</td>
</tr>
<tr>
<td>Midwives</td>
<td>58</td>
<td>2.2(3.2)</td>
<td>2.7(3.3)</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>46</td>
<td>0.2(0.6)</td>
<td>0.5(0.8)</td>
</tr>
<tr>
<td>Pharmacist-assistants</td>
<td>42</td>
<td>0.9(1.4)</td>
<td>0.7(1.6)</td>
</tr>
<tr>
<td>Laboratory technologists</td>
<td>44</td>
<td>0.3(0.1)</td>
<td>0.6(0.8)</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>54</td>
<td>0.9(1.3)</td>
<td>1.0(1.1)</td>
</tr>
<tr>
<td>Support staff</td>
<td>61</td>
<td>6.5(8.8)</td>
<td>14.3(13.7)</td>
</tr>
<tr>
<td>Total staff</td>
<td>63</td>
<td>24.0(21.8)</td>
<td>29.5(26.1)</td>
</tr>
<tr>
<td>Total staff to patient ratio</td>
<td>63</td>
<td>51.9(33.1)</td>
<td>51.4(37.5)</td>
</tr>
<tr>
<td>Total staff vacancies</td>
<td>6</td>
<td>4.8(4.7)</td>
<td>2.3(3.8)</td>
</tr>
</tbody>
</table>

Health infrastructure

<table>
<thead>
<tr>
<th></th>
<th>No. Clinics</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>Mean Diff.</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission/observation wards</td>
<td>63</td>
<td>1.8(1.0)</td>
<td>2.5(1.3)</td>
<td>0.7</td>
<td>0.0000‡</td>
</tr>
<tr>
<td>OPD consulting rooms</td>
<td>63</td>
<td>1.5(1.2)</td>
<td>2.6(7.1)</td>
<td>1.1</td>
<td>0.2528</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>60</td>
<td>1.0(0.2)</td>
<td>1.0(0.3)</td>
<td>0.0</td>
<td>0.5681</td>
</tr>
<tr>
<td>Medical laboratories</td>
<td>50</td>
<td>0.7(0.5)</td>
<td>0.9(0.4)</td>
<td>0.2</td>
<td>0.0036†</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Ghana Project (2014); paired t-test *P <0.1; †P <0.05; ‡P <0.0001

NOTE: All means and SD are rounded up to one decimal place

†Number of clinics with complete comparable baseline and follow-up data

**The phenomenal increment in the staffing situation of health facilities during follow-up may not be attributed to the SCE interventions since the project did not have the capacity to influence recruitment of additional staff. Perhaps these increases could best be ascribed to institutional and national level developments between the baseline and the follow-up surveys (approximately 2 years). Moreover, the upgrading of a number of the health facilities from clinic/health centre status to hospital status by the NHIA might have influenced these statistics since such upgrading often require a commensurate improvement in human and material resource capacity.

Effect of SCE interventions on patient safety and risk reduction efforts in clinics

Assessment scores in risk area 1 (leadership and accountability) show that intervention health facilities recorded relatively higher marginal increases between 2012 and 2014 (mean = 22) than control facilities (mean = 13) (P <0.0001); likewise, intervention facilities (mean = 16) improved more than control facilities (mean = 10) in risk area 2 (i.e. competent/capable workforce) (P <0.0001). Overall score in all risk areas was relatively higher in intervention (mean = 16) than control facilities (mean = 13) (P <0.05). There were no significant differences between intervention and control health facilities in risk areas 3, 4 and 5 which are predominantly medical technical areas (see Figure 4).

Source: WOTRO-COHEiSION Ghana Project (2014)
Results of a multivariate multiple regression analysis showed that the SCE interventions significantly enhanced leadership processes and accountability. It was found that intervention facilities had 10.4 times higher odds of an improvement in staff competencies (Coef. = 10.4; P < 0.05) than control facilities. Intervention facilities also had 7.1 times higher odds of an improvement in staff competencies (Coef. = 7.1; P < 0.05) than control facilities. Besides the SCE interventions, number of laboratories per clinic appeared to be a significant determinant of scores in the five risk areas (P < 0.05) (see Table 2).

Post estimation predictive margins and contrast tests confirmed that on the whole, intervention facilities have higher predictive probabilities of attaining better assessment scores than control facilities. Post estimation predictive margins and contrast tests confirmed that on the whole, intervention facilities have higher predictive probabilities of attaining better assessment scores than control facilities.

Table 2: Association between patient safety markers and SCE interventions: covariates corrected

<table>
<thead>
<tr>
<th>Variables</th>
<th>Risk area 1</th>
<th>Risk area 2</th>
<th>Risk area 3</th>
<th>Risk area 4</th>
<th>Risk area 5</th>
<th>Overall score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef. (95% CI)</td>
<td>Coef. (95% CI)</td>
<td>Coef. (95% CI)</td>
<td>Coef. (95% CI)</td>
<td>Coef. (95% CI)</td>
<td>Coef. (95% CI)</td>
</tr>
<tr>
<td>Intervention clinics</td>
<td>10.4 (3.05)**</td>
<td>7.1 (3.31)**</td>
<td>4.1 (2.71)</td>
<td>4.4 (1.810.5)</td>
<td>4.9 (2.115.6)</td>
<td>6.1 (0.9613.10)**</td>
</tr>
<tr>
<td>Control clinics</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Private clinics</td>
<td>1.27 (-9.124)</td>
<td>0.10 (-7.419)</td>
<td>4.3 (-32.118)</td>
<td>3.1 (-3.810)</td>
<td>8.4 (-25.193)</td>
<td>3.6 (4.2113.1)</td>
</tr>
<tr>
<td>Public clinics</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>GAR clinics</td>
<td>-3.4 (-18.17.4)</td>
<td>-5.0 (12.22)</td>
<td>0.1 (1.72)</td>
<td>-4.1 (-10.74)</td>
<td>-4.0 (-14.65)</td>
<td>-3.0 (-10.54.5)</td>
</tr>
<tr>
<td>WR clinics</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>No. of consulting rooms</td>
<td>0.1(-0.8 0.56)</td>
<td>0.03 (-0.48 0.4)</td>
<td>0.03 (-0.38 0.08)**</td>
<td>0.31 (-0.70 0.10)</td>
<td>-0.25 (-0.91 0.40)</td>
<td>-0.24 (-0.70 0.23)</td>
</tr>
<tr>
<td>No. of Laboratories</td>
<td>17.9 (4.315)**</td>
<td>11.4 (2.35)**</td>
<td>8.2 (-10.174)**</td>
<td>8.5 (0.1116)**</td>
<td>13.4 (0.0826)**</td>
<td>11.4 (1.8620.9)**</td>
</tr>
<tr>
<td>Staff:patient ratio</td>
<td>0.07 (0.120)</td>
<td>0.02 (-0.07 0.1)</td>
<td>-0.01(-0.10 0.08)</td>
<td>0.02 (-0.06 0.10)</td>
<td>0.02 (-0.11 0.15)</td>
<td>0.02 (-0.07 0.11)</td>
</tr>
</tbody>
</table>

Source: WITRO-COHEiSION Ghana Project (2014). Multivariate multiple regression analysis: *P < 1.0; **P < 0.05 (estimations based on follow-up data only)

Legend: GAR = Greater Accra Region; WR = Western region; Risk area 1 = Leadership processes and accountability; Risk area 2 = Competent and capable workforce; Risk area 3 = Safe environment for staff and patients; Risk area 4 = Clinical care of patients; Risk area 5 = Improvement of quality and safety; Overall score = summated scores of all risk areas per clinic. Refer to Methods section for computation and interpretation of risk areas.
### Table 3: Post estimation of predictive margins and contrast

<table>
<thead>
<tr>
<th>Variables</th>
<th>Delta-method</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control clinics = 0</td>
<td>42.1</td>
<td>35.4 - 48.9</td>
</tr>
<tr>
<td>Treated clinics = 1</td>
<td>48.5</td>
<td>41.4 - 55.4</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WR = 0</td>
<td>46.1</td>
<td>38.4 - 53.7</td>
</tr>
<tr>
<td>GAR = 1</td>
<td>44.5</td>
<td>38.2 - 50.8</td>
</tr>
<tr>
<td><strong>Intervention/Region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0</td>
<td>47.0</td>
<td>36.6 - 57.4</td>
</tr>
<tr>
<td>0 1</td>
<td>37.1</td>
<td>28.3 - 46.2</td>
</tr>
<tr>
<td>1 0</td>
<td>45.1</td>
<td>34.3 - 55.9</td>
</tr>
<tr>
<td>1 1</td>
<td>51.7</td>
<td>42.9 - 60.5</td>
</tr>
<tr>
<td><strong>Ownership</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public = 0</td>
<td>43.5</td>
<td>35.3 - 51.7</td>
</tr>
<tr>
<td>Private = 1</td>
<td>47.0</td>
<td>41.1 - 53.0</td>
</tr>
<tr>
<td><strong>Intervention/Ownership</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 0</td>
<td>45.7</td>
<td>35.4 - 56.1</td>
</tr>
<tr>
<td>0 1</td>
<td>38.5</td>
<td>29.6 - 47.4</td>
</tr>
<tr>
<td>1 0</td>
<td>41.2</td>
<td>29.0 - 53.5</td>
</tr>
<tr>
<td>1 1</td>
<td>55.6</td>
<td>47.8 - 63.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post estimation Contrast</th>
<th>Delta-method</th>
<th>P-value</th>
<th>95% Conf. Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention vs control</td>
<td>10.3</td>
<td>0.0299**</td>
<td>1.0 - 19.6</td>
</tr>
<tr>
<td>GAR vs WR</td>
<td>-1.2</td>
<td>0.0001</td>
<td>-11.3 - 8.8</td>
</tr>
<tr>
<td>Private vs Public</td>
<td>4.0</td>
<td>0.0562</td>
<td>-6.5 - 14.5</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHESION Ghana Project (2014); Contrast significant (*P <0.05); predictive margins significant (**P <0.001) (estimations based on follow-up data only). Legend: GAR (Greater Accra Region); WR (Western region)

### Associations between community groups and post-intervention risk assessment scores

The results showed that the types of community groups involved in SCE have some significant associations with post-intervention risk assessment scores of healthcare facilities. As shown in Fig 5, community volunteer groups (CVGs) seemed to have the least influence on assessment scores. Healthcare facilities assessed by CVGs attained mean% scores of 28.7 and 41.2 in risk areas 1 and 2 respectively compared to facilities assessed by other groups (P <0.1).

Spearman correlation test established a negative association between CVG and assessment scores in risk area 1 (i.e. leadership and accountability) (Coef. = -0.2494, P <0.1) (see Table 4). Healthcare facilities that recorded the highest mean% scores in risk area 1 were assessed by artisans (mean = 58.4); traders (mean = 53.5); widows (mean = 52.0) and religious/faith-based groups (mean = 50.6) (see Table 4).

In terms of gender distribution of community groups, male dominated groups did not appear to offer improvement in health care quality after the interventions. As shown in Table 4, male only or male dominated groups had negative associations with all the risk assessment areas (P <0.05) relative to groups that are either female dominated or balanced male-female distribution.

It was also found that community groups with predominantly elderly members (30+ years) are more likely to influence positive change in leadership and accountability practices of health facilities than a relatively youthful group. Counter intuitively, community groups with mainly literate members associated negatively with all risk areas including risk areas 1 (Coef. = -0.2760, P <0.05) and 2 (Coef. = -2356, P <0.1).

In terms of geographic location, urban community groups were positively associated with better assessment scores in risk areas 1 and 2 but rural groups were not. Community groups that had structured leadership were positively associated with higher assessment scores in all the five risk areas including risk areas 1 (Coef. = 0.3265, P <0.05) and 2 (Coef. = 0.3523, P <0.05). Groups with large membership appeared to have negative association with scores in risk areas 3 and 4 but positively associated with risk areas 1, 2 and 5; longer meeting durations and contribution time per group member had negative associations with all risk areas (see Table 4).
Table 4: Associations between types of groups and risk assessment areas

<table>
<thead>
<tr>
<th>Community characteristics</th>
<th>Risk area 1</th>
<th>Risk area 2</th>
<th>Risk area 3</th>
<th>Risk area 4</th>
<th>Risk area 5</th>
<th>Overall*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religious</td>
<td>22</td>
<td>0.1257</td>
<td>0.0942</td>
<td>-0.1651</td>
<td>-0.1961</td>
<td>-0.0887</td>
</tr>
<tr>
<td>Traders</td>
<td>8</td>
<td>-0.0256</td>
<td>-0.1290</td>
<td>0.0502</td>
<td>-0.0322</td>
<td>0.0357</td>
</tr>
<tr>
<td>Widows</td>
<td>1</td>
<td>-0.0996</td>
<td>-0.1412</td>
<td>-0.0943</td>
<td>-0.1882</td>
<td>0.0904</td>
</tr>
<tr>
<td>Community volunteers</td>
<td>3</td>
<td>-0.2494*</td>
<td>-0.1442</td>
<td>-0.1499</td>
<td>-0.3185</td>
<td>-0.2156</td>
</tr>
<tr>
<td>Music</td>
<td>2</td>
<td>-0.0618</td>
<td>0.0941</td>
<td>-0.0135</td>
<td>0.0336</td>
<td>0.0402</td>
</tr>
<tr>
<td>Artisans</td>
<td>5</td>
<td>0.2062</td>
<td>0.1886</td>
<td>0.2152</td>
<td>0.2936**</td>
<td>0.1487</td>
</tr>
<tr>
<td>Youth</td>
<td>11</td>
<td>-0.1035</td>
<td>-0.0506</td>
<td>0.1236</td>
<td>0.1803</td>
<td>0.0694</td>
</tr>
<tr>
<td>Gender distribution</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All males</td>
<td>2</td>
<td>-0.0137</td>
<td>-0.0134</td>
<td>0.0404</td>
<td>-0.0336</td>
<td>0.0670</td>
</tr>
<tr>
<td>All females</td>
<td>5</td>
<td>0.1703</td>
<td>0.0658</td>
<td>0.1449</td>
<td>0.0833</td>
<td>0.0787</td>
</tr>
<tr>
<td>Male dominant</td>
<td>13</td>
<td>-0.3632**</td>
<td>-0.2956**</td>
<td>-0.3767**</td>
<td>-0.2954**</td>
<td>-0.3989**</td>
</tr>
<tr>
<td>Female dominant</td>
<td>31</td>
<td>0.1804</td>
<td>0.1712</td>
<td>0.1741</td>
<td>0.1685</td>
<td>0.2312*</td>
</tr>
<tr>
<td>Equal males and females</td>
<td>1</td>
<td>0.1540</td>
<td>0.1977</td>
<td>0.1979</td>
<td>0.1976</td>
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<td>Age distribution</td>
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<tr>
<td>Youthful (18-30 years)</td>
<td>18</td>
<td>-0.1944</td>
<td>-0.0082</td>
<td>-0.0027</td>
<td>0.1032</td>
<td>-0.0813</td>
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<tr>
<td>Elderly (31+ years)</td>
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<td>0.1944</td>
<td>0.0082</td>
<td>0.0027</td>
<td>-0.1032</td>
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<td>Mainly illiterates</td>
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<td>Rural</td>
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<tr>
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<tr>
<td>Structured</td>
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<td>0.3523**</td>
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<td>Meeting dynamics</td>
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<td>Group size (mean = 29)</td>
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<tr>
<td>*Meeting duration (mean = 41)</td>
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<td>0.0000</td>
<td>-0.1616</td>
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Source: WOTRO-COHEiSION Ghana Project (2014)

Note: Spearman rank correlation test *P <1.0; **P <0.05. Estimations based on follow-up data only and pairwise correlation coefficients not adjusted for Bonferroni or Sidak; Legend: Risk area 1=Leadership processes and accountability; Risk area 2=Competent and capable workforce; Risk area 3=Safe environment for staff and patients; Risk area 4=Clinical care of patients; Risk area 5=Improvement of quality and safety; Overall score=summed scores of all risk areas per clinic. Refer to Methods section for computation and interpretation of risk areas; Average duration of group meeting reported in minutes; *Average time for group member contribution reported in minutes.

DISCUSSION

Systematic engagement of communities in healthcare quality assessment is a potentially useful quality improvement strategy required to promote health provider accountability to clients and regain the dwindling client confidence in Ghana’s healthcare system [26,29,30]. The findings of this study corroborate conclusions in previous studies that when health providers realise their activities are closely monitored by the communities they serve, they turn to show greater accountability and responsiveness to clients’ needs [8-10,30-33]. Moreover, findings of this RCT suggest that harnessing available community resources through systematic engagement could complement central governments’ efforts towards quality improvement especially in primary healthcare facilities which constitute over 70% of the nearly 4,000 NHIS-accredited service providers in Ghana [25].

Even though the interventions did not seem to have significant effect on mainstream medical quality markers, the effect on administrative and non-technical components of healthcare was established. Perhaps limited client knowledge on medical technical processes of healthcare account for this outcome, albeit health literacy levels of the community groups were not explored via-a-vis the assessment scores in this study.

As demonstrated in this study, SCE is potentially cost effective and sustainable for health systems in Africa with limited resources because it is championed by community members and resources are mobilized from within the community. The SCE concept requires minimal financial commitment and can easily be sustained by communities with technical support from local health authorities.

Per the interventions design, approximately US$ 380,000 can be used to implement SCE cycle in a year. This modest financial commitment is potentially scalable considering the relatively higher monitoring and evaluation (M&E) costs undertaken by the GHS and NHIA in Ghana. In 2012 alone, the NHIA operating expenditure for M&E activities (including parliamentary M&E and district health projects support) was approximately GHC 11.10 million (over US$ 3 million equivalence) [25].

Besides the positive outcomes of this RCT, it is important to acknowledge that some results of the study are not necessarily attributed to the SCE interventions. First, the apparent large increases in health service utilization and improvements in some human and material resources in intervention clinics might be attributed to institutional and national level developments between the baseline and follow-up periods. This is because the SCE interventions had limited capacity to influence staff recruitment and resource allocation/distribution to these clinics. For instance, approximately 12% of the 32 intervention facilities were upgraded to higher levels before the follow-up survey and this might have correspondingly influenced the increased service utilization and human resource capacities of these facilities independent of the interventions (see Figure 3).

Even though the interventions did not explore religion and gender dynamics into detail, it appears from the findings that religious/faith-based groups; groups with gender balanced composition and groups with organised leadership are likely to be more suitable for effective implementation of SCE interventions. Although reasons for this outcome were not explored into...
In addition, societal respect and trust for religious bodies in many local Ghanaian communities might explain this outcome. In a study involving 19 sub-Saharan African (SSA) countries including Ghana, Tortora [34] found that community members trusted faith-based organisations more than their governments. In light of this trust and confidence, these religious groups are increasingly being engaged in health programmes to guarantee successful implementation [35,36].

In terms of the gender dynamics of the community groups, it was found that engaging only males or male-dominated groups did not have a positive association with healthcare quality assessment scores after the interventions, but groups which composed of males and females or were female dominated had a positive association with most quality healthcare proxies. This observation could be explained by the fact that in Ghana (like many SSA countries) women, particularly in rural deprived areas, turn to have greater health needs than men [37,38]; moreover, women are more likely to utilize healthcare services and probably be conversant with quality healthcare gaps than males [37].

Further exploration of these posits by future studies could help arrive at more concrete conclusions on gender dynamics in community engagement in healthcare quality assessment.

The negative association between community volunteer groups (CVGs) and healthcare quality assessment scores in all the five risk areas (see Table 4) appear to be counter intuitive given the valuable contributions of CVGs to health programmes at the primary healthcare level in many SSA countries [4,8-10] including Ghana [1,13,14,15]. This observation probably reveals a diminishing volunteering role of CVGs in health programmes at the community level.

Perhaps activities of CVGs are increasingly being undermined by the fast changing cosmopolitan societies in Africa and are no longer effective options for promoting community engagement in health. Since the current study did not explore these outcomes in detail, future studies could explore the role of CVGs in primary healthcare in contemporary health systems in Africa. This will help determine whether or not CVGs are indeed becoming defunct in primary healthcare interventions.

Furthermore, the evaluation found that community groups without formal education did not seem to constitute a barrier to assessing healthcare quality though lack of basic health knowledge might have limited their ability to adequately identify gaps in medical technical quality healthcare components. Community groups that composed of mainly literate members as associated negatively with high quality assessment scores in intervention facilities. Maybe group members with formal education had less contact and experiences with the primary healthcare facilities which are often perceived by the elite as “inferior” service providers [20].

In view of this, it is possible quality improvement recommendations from these so-called educated groups were irrelevant to the lower level health facilities which they seldom patronize.

It is evident from the evaluation outcome that for community groups to be effective in SCE they must, inter alia, be better organised and perhaps heterogeneous in composition. The relevance of religious groups in ensuring effective implementation of community engagement activities is also implicit though not adequately explored in this study.

**Limitations**

This RCT is not a double blind randomization and the researchers’ knowledge of which health facilities received intervention had the potential to introduce bias in analysis of results at the facility level [22]. Cognizant of this potential bias, facility codes were used during the analysis to anonymize the facilities. Furthermore, key informants in health facilities were blinded to the intervention and control clinics to reduce potential for biased responses due to Hawthorne Effect [39].

Besides the impact of the SCE interventions, upgrading of some health facilities from clinic/health centre to full-fledged hospital status before the follow-up survey might have influenced health infrastructure, human resources, service utilization and potentially scores of the quality healthcare proxies. In view of this, multivariate multiple regression analysis and post estimation predictive margins and contrast tests were used to correct the possible effect of these extraneous factors.

**Policy recommendations and highlights**

Based on the evaluation outcome of this study, the following highlights are proposed for policy consideration:

1. **Policy dialogues and stakeholder consultation:** Health policy makers at the national, regional and district levels should initiate policy dialogues and comprehensive stakeholder consultation on how to leverage potentials of existing community groups in healthcare quality assessment using the SCE concept; during these dialogues, opportunities and challenges in using religious and gender based organisation s for quality healthcare assessment should be explored.

2. **Building on existing frameworks:** The SCE concept should be integrated into existing health sector policy frameworks on quality improvement by harmonizing current M&E budget lines and checklists with the SCE implementation steps.

3. **Expanding platforms for community engagement in health:** Peer reviews among health facilities and assessment of health sector performance (organised by GHS and MoH in Ghana) should effectively include SCE sessions to serve as platforms for disseminating community grievances on quality healthcare in health facilities, beyond the conventional patient satisfaction survey reports.

4. **Proposed steps to piloting the SCE concept:** The following proposed steps should be considered by policy makers to determine the feasibility or otherwise of using existing community groups to assess healthcare quality in health facilities:
   - **Step 1:** A policy discussion and pilot study should be initiated to determine the feasibility of the SCE on a small scale. Possible implementation challenges such as inadequate eligible community groups; health provider and/or community apathy and political interference should be addressed during this stage.
   - **Step 2:** A SCE experiment in nationally representative communities should be conducted to inform a progression onto step 3 or otherwise.
c. Step 3: A replication of the SCE experiment in many districts in the country to ascertain whether or not it can survive in other settings with different demographic and socio-economic conditions.

d. Step 4: Once a replicated experiment attains significant success rate, a nationwide scale-up will then be warranted.

Conclusion

Systematic engagement of existing community groups in healthcare quality assessment has the potential to enhance efforts towards better administrative and accountability processes by healthcare providers but might not be effective in assessing mainstream medical technical quality due to possible knowledge/information asymmetry between clients and healthcare providers.

Even though the SCE interventions might have the challenge of community groups’ heterogeneity and its varying effect on healthcare quality assessment outcomes, the SCE initiative is deemed relevant and potentially sustainable for the Ghanaian context and other resource poor settings in SSA.

While acknowledging some limitations of this RCT, the authors conclude (based on the evaluation outcome) that community engagement in healthcare quality assessment is less expensive to implement and community-focused; thus, it should be discussed for piloting and eventual integration into existing quality improvement strategies in Ghana where universal access to basic quality healthcare remains a major challenge [40]. Likewise, other SSA countries equally confronted with quality healthcare challenges could learn from this evidence from Ghana and possibly replicate the SCE initiative in their health systems.

Acknowledgement/Funding

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REFERENCES


Assessing the impact of community engagement interventions on health worker motivation and experiences with clients in primary health facilities in Ghana: a randomized cluster trial
Community engagement and health worker motivation

ABSTRACT

Background
Health worker density per 1000 population in Ghana is one of the lowest in the world estimated to be 2.3, below the global average of 9.3. Low health worker motivation induced by poor working conditions partly explain this challenge. Albeit the wage bill for public sector health workers is about 90% of domestic government expenditure on health in countries such as Ghana, staff motivation and performance output remain a challenge, suggesting the need to complement financial incentives with non-financial incentives through a community-based approach. In this study, a systematic community engagement (SCE) intervention was implemented to engage community groups in healthcare quality assessment to promote mutual collaboration between clients and healthcare providers, and enhance health worker motivation levels. SCE involves structured use of existing community groups and associations to assess healthcare quality in health facilities. Identified quality gaps are discussed with healthcare providers, improvements made and rewards given to best performing facilities for closing quality healthcare gaps.

Purpose
To evaluate the effect of SCE interventions on health worker motivation and experiences with clients.

Methods
The study is a cluster randomized trial involving health workers in private (n = 38) and public (n = 26) primary healthcare facilities in two administrative regions in Ghana. Out of 324 clinical and non-clinical staff randomly interviewed at baseline, 234 (72%) were successfully followed at end-line and interviewed on workplace motivation factors and personal experiences with clients. Propensity score matching and difference-in-difference estimations were used to estimate treatment effect of the interventions on staff motivation.

Results
Intrinsic (non-financial) work incentives including cordiality with clients and perceived career prospects appeared to be prime sources of motivation for health staff interviewed in intervention health facilities while financial incentives were ranked lowest. Intervention health facilities that were assessed by female community groups (Coef. = 0.2720, P = 0.0118) and informal groups with organised leadership structures like Artisans (Coef. = 0.2268, P = 0.0368) associated positively with higher intrinsic motivation levels of staff.

Conclusion
Community-based approach to health worker motivation is a potential complementary strategy that needs policy deliberation to explore its prospects. Albeit financial incentives remain critical sources of staff motivation, innovative non-financial approaches like SCE should complement the latter.

BACKGROUND
Health sector human resource remains a critical input factor in health service delivery. A 2013 progress report by the World Health Organisation (WHO) titled “A universal truth: no health without a health workforce” intimated the important role played by health workers in the attainment of universal health coverage and health sector goals. Though the global health workforce situation is relatively better in most developed countries, statistics on poor countries remain appalling particularly in Africa [1].

According to the WHO estimates, a minimum density threshold of 22.8 skilled health professionals per 10,000 people is required globally to provide the most basic health coverage but 83 countries (mostly in Africa) fall below this threshold [1]. Even though over 59 million health workers are recorded globally, the distribution of this workforce within and between countries is disproportionate with the health needs and disease burdens of these countries. African countries bear the brunt of health workforce shortage requiring approximately 139% increase to meet the growing population health needs [2].

In Ghana, the health worker density per 1000 population is estimated to be 2.32 [3], below the global average of 9.3 [2]. Low staff motivation levels induced by prevailing poor working conditions is a major contributory factor for the disparities in health workforce distribution in Ghana [4-7].

Determinants of health worker motivation have been explored in the literature from varying perspectives. Bennette and Franco [8] defined health worker motivation as an individual’s degree of willingness to exert and maintain an effort towards organisational goals. The role of societal and community context in health worker motivation has been demonstrated in the argument by Bennette and Franco [8] that health worker motivation entails an internal psychological process that is influenced by the organisation and larger societal context. Theories on worker motivation are broadly categorized into four namely: need-based, cognitive process, behavioural and job-based theories. Motivation theories that explain employees’ quest to satisfy their needs through work were categorized as need-based theories in Jex and Britt [9]. These theories contend that workers attain motivation by being able to attain their needs, ranging from basic physiological needs to higher level ones such as self-actualization.

Cognitive process theories of worker motivation argue that motivation at the workplace, including healthcare facilities, is a function of cognitive process of evaluation where employees strive to achieve a perceived balance between their efforts at the workplace and rewards given or anticipated [9]. Behavioural theories suggest that motivation can be promoted when beneficial employee’s behaviour is rewarded and non-beneficial behaviour is discouraged through prudent punishment [9]. Job-based theories of motivation, however, maintain that the design of an employee’s job in itself can determine motivation levels, thus a job can be motivating by its design and content [9].

Even though these theories of motivation have limitations [9], they remain relevant to this study and contemporary discussions on employee motivation within the health sector [8].
Chapter 6

Empirical conclusions on the determinants of health worker motivation differ. Mathauer and Imhoff [12] indicated that besides the demand for equity in employee effort: reward ratios and financial incentives, intrinsic/non-financial motivation factors such as opportunity for promotion, ability to satisfy professional conscience and available work logistics are significant determinants of worker motivation. For the purposes of this paper, the researchers utilized Bennett and Franco’s [8] conceptual framework on intrinsic and extrinsic motivational factors.

As part of efforts towards enhancing staff motivation levels in Ghana, work incentives such as salary increment and payment of extra duty hours allowance are often implemented [3,10,12]. Albeit these incentives are relevant, mainly relying on them without adequate complementary intrinsic (non-financial) incentives has proved insufficient in sustaining staff motivation and performance output [4,11,12,13].

Moreover, limited health budgets of most countries in Africa including Ghana pose a significant challenge for these countries to rely solely on financial rewards to motivate health staff which do not guarantee desired performance output [7]. Although over 90% of domestic expenditure on health is on the wage bill (staff salaries) in countries such as Ghana [16], staff productivity and quality of healthcare delivery remain a major challenge in health facilities [4,11]. Since health staff motivation is determined by factors beyond material and financial rewards, there is the need to explore the possible benefits of intrinsic (non-financial) motivational packages which could be potentially cost effective and sustainable in the long term.

Studies have shown that besides financial incentives, good working relationships between staff and clients promotes staff motivation and quality of healthcare delivery, especially at the primary healthcare level [17,18]. Health workers who perceive a sense of duty to the community they serve are more likely to be intrinsically motivated and have better working experience with clients [19,20].

This paper hypothesizes that Systematic Community Engagement (SCE) in health is a potential approach that could help enhance relationships between service providers and communities and promote health worker intrinsic motivation level.

Community engagement as defined by Morgan and Lifshay [21], cited in Alhassan et al. [22], is dynamic relationships and dialogue between community members and local health professionals with varying degrees of community and higher level health authorities’ involvement in decision-making and control.

Though the concept of community engagement in health is not entirely new in Ghana [23-28], empirical evidence of its relevance and relationship with health worker motivation is quite limited and grey. Available information on community engagement in health is largely reported in annual reports, project reports and media briefs usually without exploring the associations with health worker motivation. Besides this study, there is no known randomized cluster trial in Ghana on this topic.

Moreover, in Ghana community engagement in health is often limited to the Community-based Health Planning and Services (CHPS) concept which by design does not deliberately engage existing community groups to assess health service quality using the SCE approach.

The SCE interventions, evaluated in this study, entailed a structured step-by-step and cyclical process of engaging community groups/associations in assessing health service quality in their nearest health facility.

Intervention health facilities where the SCE interventions were implemented were all accredited by the National Health Insurance Authority (NHIA). The NHIA is the regulatory authority under the Ministry of Health (MoH) responsible for credentialing of health facilities willing to render services to subscribers of Ghana’s National Health Insurance Scheme (NHIS). Thirty-two (32) healthcare facilities were randomly assigned to treatment and control facilities. Out of the 32 treatment facilities, 16 from each of the two study regions were assigned to receive SCE interventions which lasted for nearly one year, costing approximately US$ 280.00 per a round of SCE. Detailed description of the SCE implementation process has been published by the authors in Alhassan et al. [22,23].

This paper evaluates impact of the SCE interventions on staff motivation levels and experiences with clients in the intervention health facilities. The hypothesis is that health facilities that are assessed by community groups will have better motivated staff and enhanced experiences with clients than control facilities.

METHODS

Study design

This study is a randomized cluster trial involving clinical and non-clinic health workers in private (n = 38) and public (n = 26) primary health facilities; n represents the respective sample sizes. Primary health facilities are operationally defined in this study to mean clinics and health centres, according to the Ghana Health Service (GHS) categorizations. Health workers with at least 6 months’ working experience were eligible to participate in the study. Randomization into intervention and control groups was done at the health facilities level, not at the staff level.

Study population and setting

The study was conducted in the Greater Accra and Western regions of Ghana in 16 administrative districts. Greater Accra region is predominantly urban with a population of about 4 million people and hosts approximately 20.6% of the estimated 53,000 health workforce in Ghana [3]. Out of the nearly 4,000 accredited health facilities in Ghana, 416 are in Greater Accra region while 430 are in Western region [29]. Western region is predominantly rural with a population of over 2 million served by 7.7% of the total health workforce in Ghana [3].
Sampling
A total of 333 questionnaires were randomly administered to eligible health staff in 64 sampled health facilities during baseline survey conducted between March and May, 2012 including mop ups. Out of this number, 324 questionnaires were correctly filled and returned representing 97% return rate. Out of the 324 staff interviewed at baseline, 234 (72%) were successfully followed between August and October, 2014 including mop ups. The 90 drop-out staff (28%) could not be followed because of transfers, deaths, resignations and retirements. One health facility was lost to follow-up due to closure thus reducing the follow-up sample size to 63 clinics.

Data collection
Structured questionnaires were used to collect information on factors that motivate or constrain health workers to deliver quality healthcare services to clients. Background information of staff and their experiences with clients during health service delivery were also explored. Staff were asked to rank their motivation levels on 19 workplace motivation proxies using a four-point Likert scale from 1 = “very disappointing” to 4 = “very satisfactory”.

The study was piloted in one private and one public health facilities in the Greater Accra region to enhance the scientific rigor and value of the full-scale study. The pilot helped determine the feasibility and acceptability of the study methodology and data collection instruments prior to full-scale implementation. The pilot facets were all excluded from the actual baseline and follow-up surveys.

A total of 16 data collectors and field supervisors were recruited and trained for three days out of which 10 data collectors and 2 field supervisors were selected for the surveys. Five data collectors and one supervisor each were assigned to the Greater Accra and Western regions to interview sampled health workers using structured questionnaires of 205 closed and open ended questions; 70 of these questions are directly related to this current paper. Average duration per interview was 55 minutes.

Ethical considerations
Ethical clearance was obtained from the Ghana Health Service (GHS) Ethical Review Committee (ERC) (clearance number: GHS-ERC: 18/5/11). Written informed consent was obtained from health facility heads, the district and regional health directorates, and individual respondents. Coding was done after data cleaning to anonymize the staff’s responses.

Statistical analysis
Analysis was done on “intention to treat” basis. Only data from staff interviewed at baseline and followed-up was used for the final analysis [30]. The STATA statistical software version 12.0 (StataCorp, College Station, Texas USA) was used for all analysis. Pearson Chi-square (X²) and Fisher’s exact tests were performed, as appropriate, to ascertain differences in socio-demographic characteristics of staff in intervention and control facilities. The t-test was used to compare parameters on staff experiences with clients in intervention and control facilities.

Iterated Principal Factor (IPF) analysis (with orthogonal varimax rotation, Kaiser off) was performed to group the 19 workplace motivational markers into 5 factors. The 5 factor-analysed parameters were predicted and named as follows: (i) physical work environment and resource availability; (ii) financial and extrinsic incentives; (iii) intrinsic incentives and cordiality with fellow staff and patients; (iv) career prospects and opportunity for further education; (v) staff strength and workload.

The average reliability coefficient for the 19 Likert scale items was tested and found to be above the 0.70 rule of thumb [31]. The four point Likert scales were intuitively determined and the five factor-analysed factors were predicted and named based on the conceptual framework by Bennett and Franco [8] on determinants of workplace motivation. Difference-in-difference (DiD) test was performed to ascertain the mean rating differences by staff in intervention and control facilities using the pooled baseline and follow-up datasets [32]. Means and standard errors of the five motivation factors were bootstrapped and estimated by linear regression.

Even though the overall study from which this paper emanates from is a randomized cluster trial by design, the health staff sampled to ascertain their perceptions of workplace motivation factors were not randomly assigned to the treatment and control arms of the study. Randomization into control and intervention groups was done at the health facility level, not the staff level. Hence, staff who by chance were found in intervention or control clinics were interviewed at random (i.e. cluster randomization).

Propensity score matching (psmatch2) was employed to determine the treatment effect of the 3CE interventions on staff motivation markers without introducing selection bias [33,34]. Potential effect of covariates such as staff gender, age, education, professional category, monthly salary, marital status, facility ownership (private or public) and religious affiliation were corrected.

RESULTS
Background information of staff and work conditions.
Out of the 234 staff successfully followed-up, 56% were in control facilities and 44% in intervention facilities; in terms of regional distribution, 128 (55%) were from Greater Accra region and 106 (45%) from Western region. In terms of ownership, 53% were from private facilities and 47% from public facilities. Females dominated males in both intervention (males = 40%; females = 60%) and control facilities (males = 30%; females = 70%). The mean age of respondents at baseline was 37 (SD = 14) and 38 (SD = 12) at follow-up. Average age of staff in intervention facilities was 38.3 (SD = 14.4) and 36.5 (SD = 13.4) in control facilities.

The proportion of staff performing clinical roles (clinical staff) in 2012 reduced from 85.5% in 2012 to 65.4% in 2014; these staff were perhaps reassigned to non-clinical duties during the follow-up survey which explains the corresponding increase in the proportion of staff performing non-clinical roles from 14.5 in 2012 to 34.6 in 2014 (P = 0.000).

Between baseline and follow-up, the average monthly salaries of health staff increased significantly; the proportion of staff who received monthly salary >GHC1, 300 (approx. US$ 370.0)
increased from 4.7 in 2012 to 12.8 in 2014 (P = 0.002). Likewise, the proportion of staff who received additional work allowance from their health facilities increased from 16.5 in 2012 to 25.7 in 2014 (P = 0.017).

The percentage of staff that belong to a professional association increased from 60.1 in 2012 to 74.4 in 2014 (P = 0.007). No significant differences were found in the educational, marital and religious characteristics of staff between baseline and follow-up. Moreover, staff travel time to work depending on means of transport did not change significantly between 2012 and 2014 (see Table 1).

**STAFF PERSONAL EXPERIENCES WITH CLIENTS**

The results show that in intervention facilities, the average number of community outreaches conducted by staff (mostly community health workers) in a month increased from 25 (SD =37) at baseline to 34 (SD = 44) during follow-up (P = 0.0105). Staff in control facilities reported relatively lower number of community outreaches per month (see Figure 1).

The average number of clients who honoured their medical appointment dates in a month improved in 2014; staff in intervention facilities experienced an average of 8 (SD =10) honoured appointments in a month in 2012 compared to 16 (SD = 29) in 2014; although staff in control facilities also reported increased number of honoured appointments by clients, the figures were relatively lower (from 14 in 2012 to 19 in 2014).

These improvements in staff perceptions in intervention facilities might not necessarily be ascribed to the effect of the SCE interventions alone since institutional level developments such as increased outpatient and inpatient services and health infrastructure might have informed staff experiences.

Responses from health staff seemed to suggest a general trend of increased client curiosity on their health conditions. During baseline, staff in intervention facilities experienced an average of 10 (SD = 21) clients asking health workers questions concerning their health conditions in a month compared to 17 (SD = 31) clients at follow-up (P = 0.0466); staff in control facilities recorded relatively better staff experiences in this regard (from 11 in 2012 to 26 in 2014).

Number of staff who experienced at least an adverse medical event in a month increased from 55 in 2012 to 75 in 2014. In intervention health facilities, the average number of adverse medical events experienced per staff per month decreased from 56 (SD = 49) in 2012 to 25 (SD = 47) in 2014. Even though staff in control facilities also experienced a reduction in number of adverse events per month, the improvement was lower (from 50(SD = 49) in 2012 to 40(SD = 47) in 2014).

Besides the possible effect of the SCE interventions on these reports by staff, the time lag (two years) between baseline and follow-up might have informed significant quality improvements and patient safety protocols that influenced staff experiences.

As shown in Figure 1, it appears more clients in 2014 sought care from informal caregivers (e.g. spiritualists, traditional healers) before visiting the health facility; in a month, staff in intervention facilities experienced an average of 21 (SD = 36) clients engaged in this practice in 2012 compared to 42 (SD = 46) clients in 2014. Staff in control facilities experienced an average of 26 (SD = 40) clients seeking care from informal sources in a month in 2012 compared to 43 (SD = 46) in 2014.
Community engagement and health worker motivation

Table 1: Profile of health staff and work conditions at baseline and follow-up

<table>
<thead>
<tr>
<th>Staff characteristic/work conditions</th>
<th>Baseline (n = 234)</th>
<th>Proportion (95% CI)</th>
<th>Follow-up (n = 234)</th>
<th>Proportion (95% CI)</th>
<th>Diff. (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff with at least tertiary education</td>
<td>234</td>
<td>74.8 (69.2    80.4)</td>
<td>234</td>
<td>77.4 (71.9    82.8)</td>
<td>2.6 (0.6    4.7)</td>
<td>0.516</td>
</tr>
<tr>
<td>Clinical staff++</td>
<td>234</td>
<td>85.5 (80.9    90.0)</td>
<td>234</td>
<td>65.4 (59.2    71.5)</td>
<td>-20.1 (−26.0    −14.2)</td>
<td>0.000**</td>
</tr>
<tr>
<td>Non-clinical staff+++</td>
<td>234</td>
<td>14.5 (10.0    19.1)</td>
<td>234</td>
<td>34.6 (21.5    48.0)</td>
<td>20.1 (10.0    30.2)</td>
<td>0.000**</td>
</tr>
<tr>
<td>Married staff</td>
<td>233</td>
<td>43.8 (37.4    50.2)</td>
<td>232</td>
<td>45.7 (39.6    51.7)</td>
<td>1.9 (−4.2    7.9)</td>
<td>0.748</td>
</tr>
<tr>
<td>Christian religion</td>
<td>233</td>
<td>96.6 (94.2    98.9)</td>
<td>233</td>
<td>95.7 (93.1    98.1)</td>
<td>-0.9 (−2.3    0.5)</td>
<td>0.631</td>
</tr>
<tr>
<td>Monthly salary &gt;GHC 1,300</td>
<td>232</td>
<td>4.7 (2.0    7.5)</td>
<td>226</td>
<td>12.8 (8.4    17.2)</td>
<td>8.1 (5.0    11.1)</td>
<td>0.002‡</td>
</tr>
<tr>
<td>Receive additional work allowance</td>
<td>224</td>
<td>16.5 (11.6    21.4)</td>
<td>224</td>
<td>25.7 (20.0    31.3)</td>
<td>9.2 (5.3    13.1)</td>
<td>0.017‡</td>
</tr>
<tr>
<td>Engaged in part time work besides regular work</td>
<td>227</td>
<td>9.3 (5.5    13.0)</td>
<td>227</td>
<td>7.8 (4.3    11.3)</td>
<td>-1.5 (−5.0    1.0)</td>
<td>0.586</td>
</tr>
<tr>
<td>Belong to a professional association</td>
<td>183</td>
<td>60.1 (52.9    67.3)</td>
<td>183</td>
<td>74.4 (67.1    81.8)</td>
<td>14.3 (9.4    19.2)</td>
<td>0.007**</td>
</tr>
<tr>
<td>Report late to work at most once in a week</td>
<td>115</td>
<td>78.3 (70.6    85.9)</td>
<td>106</td>
<td>70.8 (62.0    79.6)</td>
<td>-7.5 (−14.7    0.7)</td>
<td>0.669</td>
</tr>
</tbody>
</table>

Average travel time to work in minutes if:

<table>
<thead>
<tr>
<th>Mode</th>
<th>Baseline (n = 234)</th>
<th>Mean (95% CI)</th>
<th>Follow-up (n = 234)</th>
<th>Mean (95% CI)</th>
<th>Diff. (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>115</td>
<td>10.5 (8.6    12.3)</td>
<td>112</td>
<td>11.9 (9.4    14.5)</td>
<td>1.4 (−0.2    2.9)</td>
<td>0.595</td>
</tr>
<tr>
<td>Bicycle</td>
<td>4</td>
<td>4.0 (1.2    6.9)</td>
<td>4</td>
<td>7.5 (4.2    10.7)</td>
<td>3.5 (1.3    5.7)</td>
<td>0.012</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>2</td>
<td>14.0 (12.2    15.8)</td>
<td>2</td>
<td>17.5 (14.3    20.7)</td>
<td>3.5 (0.3    6.7)</td>
<td>0.055</td>
</tr>
<tr>
<td>Public transport</td>
<td>4</td>
<td>19.3 (16.5    22.2)</td>
<td>4</td>
<td>22.0 (18.8    25.3)</td>
<td>2.7 (0.5    4.9)</td>
<td>0.000**</td>
</tr>
<tr>
<td>Personal car</td>
<td>3</td>
<td>31.0 (28.2    33.8)</td>
<td>3</td>
<td>36.2 (33.0    39.4)</td>
<td>5.2 (2.0    8.4)</td>
<td>0.009‡</td>
</tr>
<tr>
<td>Extra work hours by staff per day (in minutes)</td>
<td>117</td>
<td>58.1 (54.0    62.2)</td>
<td>117</td>
<td>65.8 (61.6    70.1)</td>
<td>7.7 (3.5    11.9)</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

Note 1: Mean testing was based on pooled baseline and follow-up responses in 2012 and 2014 respectively. Means were derived from a four-point Likert scale from 1 = "Very disappointing" to 4 = "Very satisfactory". High summated scores per staff motivation area depict better satisfaction with work conditions and vice-versa.

Note 2: Extrinsic motivation is derived from financial and material work conditions of a job (e.g. salary increment, promotion, accommodation etc.); Intrinsic motivation is derived from the inner joy and satisfaction derived from a job (e.g. societal recognition and respect; appreciation shown by clients etc.).

The average number of clients defaulting in medical treatment protocols increased in control facilities from an average of 22 (SD = 38) clients in a month in 2012 to 32 (SD = 44) in 2014. Staff in intervention facilities did not experience significant increases in number of defaulting clients. Likewise, the average number of clients reporting with history of self-medication reduced in intervention facilities from 20 (SD = 35) in a month in 2012 to 17 (SD = 38) in 2014. Control facilities increased from 17 (SD = 31) in a month in 2012 to 24 (SD = 32) in 2014, but the differences were not statistically significant (see Figure 1).

Effect of SCE interventions on staff motivation

Pooled baseline and follow-up staff responses showed that the predominant sources of motivation for staff in intervention facilities were intrinsic incentives including cordiality with clients and co-workers (mean = 3.5), career prospects (mean = 3.2) and staff strength/perceived workload (mean = 3.2). Staff in intervention facilities rated these motivation proxies higher than staff in control facilities (P = 0.000). Financial/extrinsic incentives were the least sources of motivation to staff particularly among staff in intervention facilities (see Figure 2), albeit the average monthly salaries/work allowances increased in nominal terms between 2012 and 2014, inflation not factored in.

Figure 2: Workplace motivating factors in treatment and control facilities

Source: WOTRO-COHEiSION Ghana Project (2014); **P <0.0001 (two tailed test of hypothesis using t-test)
### Table 2: Differences in staff motivation levels in treatment and control facilities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obs Mean (SE)</td>
<td>Mean (SE)</td>
<td>Obs Mean (SE)</td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
<td>Mean (SE)</td>
</tr>
<tr>
<td>Physical work environment**</td>
<td>437 2.32 (0.23)</td>
<td>2.33 (0.21)</td>
<td>-0.01 (0.01)</td>
<td>2.34 (0.23)</td>
<td>2.25 (0.22)</td>
<td>0.10 (0.08)</td>
</tr>
<tr>
<td>Financial and extrinsic incentives¹</td>
<td>433 0.91 (0.25)</td>
<td>1.10 (0.23)</td>
<td>-0.19 (0.01)*</td>
<td>1.14 (0.23)</td>
<td>1.23 (0.23)</td>
<td>-0.09 (0.08)</td>
</tr>
<tr>
<td>Intrinsic incentives²</td>
<td>438 3.54 (0.16)</td>
<td>3.32 (0.16)</td>
<td>0.22 (0.04)‡</td>
<td>3.41 (0.15)</td>
<td>2.97 (0.16)</td>
<td>0.44 (0.07)‡</td>
</tr>
<tr>
<td>Career prospects</td>
<td>431 2.84 (0.23)</td>
<td>2.17 (0.24)</td>
<td>0.68 (0.11)‡</td>
<td>2.87 (0.25)</td>
<td>2.08 (0.21)</td>
<td>0.79 (0.10)‡</td>
</tr>
<tr>
<td>Perceived workload</td>
<td>435 2.69 (0.21)</td>
<td>2.19 (0.22)</td>
<td>0.51 (0.11)‡</td>
<td>2.71 (0.19)</td>
<td>2.20 (0.20)</td>
<td>0.51 (0.08)‡</td>
</tr>
<tr>
<td>Overall motivation score</td>
<td>414 2.42 (0.16)</td>
<td>2.17 (0.15)</td>
<td>0.24 (0.04)‡</td>
<td>2.44 (0.15)</td>
<td>2.11 (0.15)</td>
<td>0.32 (0.06)‡</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Ghana Project (2014); Diff-in-diff estimates*P < 0.1; **P < 0.05; ‡P < 0.0001 (Means and SE are bootstrapped and estimated by linear regression); *Extrinsic motivation is derived from financial and material work conditions of a job (e.g. salary increment, promotion, accommodation etc.); ‡Intrinsic motivation is derived from the inner joy and satisfaction derived from a job (e.g. societal recognition and respect; appreciations shown by clients etc.); #Number of pooled responses from baseline and follow-up surveys.

Legend: NOTE SE = Standard Error; All mean and SE values rounded up to the nearest decimal. FU = Follow-up survey; BL = Baseline survey

*Staff motivation factors have been factor-analysed

**Physical work environment includes resource availability for staff to work with

### Table 3: Model specification for propensity score matching

<table>
<thead>
<tr>
<th>Variables</th>
<th>Variable definition</th>
<th>Intervention n = 103 (44%)</th>
<th>Control n = 131 (56%)</th>
<th>Difference in means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean SD</td>
<td>Mean SD</td>
<td></td>
</tr>
<tr>
<td>Treatment variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCEI/NCEI</td>
<td>1 if SCEI clinic; 0 otherwise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome variables³</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation factor 1</td>
<td>Motivation factors (factor-analysed)</td>
<td>2.97 0.66</td>
<td>2.87 0.72</td>
<td>0.10</td>
</tr>
<tr>
<td>Motivation factor 2</td>
<td>1.80 0.64</td>
<td>1.90 0.70</td>
<td>-0.10</td>
<td></td>
</tr>
<tr>
<td>Motivation factor 3</td>
<td>3.63 0.32</td>
<td>3.29 0.53</td>
<td>0.34***</td>
<td></td>
</tr>
<tr>
<td>Motivation factor 4</td>
<td>3.19 0.51</td>
<td>2.51 0.91</td>
<td>0.68***</td>
<td></td>
</tr>
<tr>
<td>Motivation factor 5</td>
<td>3.24 0.49</td>
<td>2.71 0.72</td>
<td>0.52***</td>
<td></td>
</tr>
<tr>
<td>Overall motivation</td>
<td>2.96 0.33</td>
<td>2.66 0.46</td>
<td>0.30***</td>
<td></td>
</tr>
<tr>
<td>Independent variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Staff age in years</td>
<td>37.4 13.1</td>
<td>37.6 13.1</td>
<td>-0.13</td>
</tr>
<tr>
<td>Gender</td>
<td>1 if male; 0 otherwise</td>
<td>0.40 0.49</td>
<td>0.30 0.46</td>
<td>0.10**</td>
</tr>
<tr>
<td>Education</td>
<td>1 if secondary education; 0 otherwise</td>
<td>0.20 0.45</td>
<td>0.21 0.40</td>
<td>0.07*</td>
</tr>
<tr>
<td>Profession</td>
<td>1 if non-clinical staff; 0 otherwise</td>
<td>0.26 0.44</td>
<td>0.24 0.44</td>
<td>0.02</td>
</tr>
<tr>
<td>Salary</td>
<td>1 if is &gt;GHC 1,300; 0 otherwise</td>
<td>0.07 0.26</td>
<td>0.10 0.30</td>
<td>-0.03</td>
</tr>
<tr>
<td>Marital status</td>
<td>1 if married; 0 otherwise</td>
<td>0.44 0.50</td>
<td>0.45 0.50</td>
<td>-0.01</td>
</tr>
<tr>
<td>Religion</td>
<td>1 if Christian; 0 otherwise</td>
<td>0.97 0.18</td>
<td>0.96 0.20</td>
<td>0.01</td>
</tr>
<tr>
<td>Facility ownership</td>
<td>1 if private clinic; 0 otherwise</td>
<td>0.59 0.49</td>
<td>0.47 0.50</td>
<td>0.12**</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Ghana Project (2014); Note: SCEI=Systematic community engagement intervention; Légend: NCEI= No Community engagement intervention; SD (standard deviation); *P < 0.1; **P < 0.05; ***P < 0.001; Staff motivation factors (defined in methods section)
Difference-in-difference estimations (see Table 2) confirmed the differences in sources of staff motivation in control and intervention facilities, after controlling the potential effect of staff age, gender, professional category, education, monthly salary, marital status, religion and health facility ownership. Moreover, the model specification for propensity score matching showed that staff in intervention facilities expressed relatively higher motivation levels than their counterparts in control facilities, especially in terms of intrinsic work incentives, career prospects, and perceived workload (P = 0.000) (see Table 3).

Results of propensity score matching established that the SCE interventions associated more with staff intrinsic motivation levels than financial incentives in both Greater Accra (ATT = 3.59, Pseudo R² = 0.0401) and Western regions (ATT = 3.69, Pseudo R² = 0.0765). Effect of the SCE interventions on financial incentives and physical work environment of staff was relatively low (see Table 4).

Overall, the findings suggest SCE activities enhanced mutual collaboration and relationships between healthcare staff and clients but had minimal effect on financial/extrinsic motivation because the study did not have the capacity to influence increment of staff salaries and other financial incentives.

### Table 4: Effect of community engagement interventions on staff motivation levels (n = 234)

<table>
<thead>
<tr>
<th>Matching algorithm: Nearest Neighbour (NN)</th>
<th><strong>“ATT (T-stat) SE</strong></th>
<th>Number of Intervention</th>
<th>Number of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater Accra region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation factor 1</td>
<td>3.09 (1.23)**</td>
<td>0.121</td>
<td>107</td>
</tr>
<tr>
<td>Motivation factor 2</td>
<td>1.71 (-1.27)**</td>
<td>0.136</td>
<td>104</td>
</tr>
<tr>
<td>Motivation factor 3</td>
<td>3.59 (3.57)**</td>
<td>0.070</td>
<td>104</td>
</tr>
<tr>
<td>Motivation factor 4</td>
<td>3.05 (3.74)**</td>
<td>0.154</td>
<td>107</td>
</tr>
<tr>
<td>Motivation factor 5</td>
<td>3.25 (4.09)**</td>
<td>0.115</td>
<td>107</td>
</tr>
<tr>
<td>Overall motivation</td>
<td>2.93 (3.37)**</td>
<td>0.076</td>
<td>116</td>
</tr>
<tr>
<td>Western region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivation factor 1</td>
<td>2.88 (0.39)†</td>
<td>0.148</td>
<td>101</td>
</tr>
<tr>
<td>Motivation factor 2</td>
<td>1.92 (-0.94)†</td>
<td>0.130</td>
<td>99</td>
</tr>
<tr>
<td>Motivation factor 3</td>
<td>3.69 (2.89)†</td>
<td>0.095</td>
<td>101</td>
</tr>
<tr>
<td>Motivation factor 4</td>
<td>3.35 (6.42)†</td>
<td>0.167</td>
<td>99</td>
</tr>
<tr>
<td>Motivation factor 5</td>
<td>3.23 (3.05)†</td>
<td>0.129</td>
<td>100</td>
</tr>
<tr>
<td>Overall motivation</td>
<td>3.01 (2.85)†</td>
<td>0.088</td>
<td>96</td>
</tr>
</tbody>
</table>

**Source:** WOTRO-COHEISSION Ghana Project (2014); **P <1.0; †P <0.05**

**ATT (Average treatment effect on the treated). The ATT values are the propensity score matching output and they depict the impact of the treatment (SCE interventions) on each of the staff motivation markers, high values imply higher treatment effect and vice versa.**

**Legend:** SE (Standard Error); Motivation factor 1 (Physical work environment and resource availability); Motivation factor 2 (Financial/extrinsic incentives); Motivation factor 3 (Intrinsic incentives including cordiality with clients and co-workers); Motivation factor 4 (Career prospects); Motivation factor 5 (Perceived workload and staff availability); Overall motivation (Overall score based on all five motivation factors).
Community engagement and health worker motivation

6

Association between community groups and staff motivation factors

Sub-sample analysis of only follow-up data of intervention facilities showed that staff motivation levels appeared to have some association with the different community groups involved in the SCE interventions. As shown in Table 5, healthcare facilities assessed by community artisan groups (Coef. = 0.2268, P = 0.0368) and female groups (Coef. = 0.2720, P = 0.0118) appeared to have more intrinsically motivated staff and perceived better the cordial relationship between clients and staff.

Healthcare facilities assessed by traders groups seemed to favour higher extrinsic/financial motivation ratings by staff (Coef. = 0.2165, P = 0.0494). Staff motivation by physical work environment had a negative association with youth groups (Coef. = -0.3488, P = 0.0010) but positively associated with literate/educated community groups (Coef. = 0.1816, P = 0.0942). Community group size (Coef. = -0.2268, P = 0.0357) and meeting duration (Coef. = -0.2808, P = 0.0088) appeared to associate negatively with staff perception ratings on workload/staff availability (see Table 5). These revelations could be explored by future researchers to ascertain possible reasons for the associations.

DISCUSSION

Community engagement in health is not new to Ghana's healthcare system [35-39] though the concept is often not applied in the context of health worker motivation. In Ghana, staff motivation policies often emphasize extrinsic incentives such as salary increment, payment of extra duty hour allowance, rural/deprived area allowance, early promotion and provision of staff accommodation to improve staff motivation levels [40]. Even though these interventions are relevant, their impact on staff motivation levels to stimulate retention, productivity and quality service delivery remain debatable [5,7]. Moreover, the cost implications of sustaining public sector wage increases in the long term could enhance client-provider relationships and potentially improve intrinsic motivation levels and retention outcomes.

As demonstrated in this study, community engagement in healthcare quality assessment could enhance client-provider relationships and potentially improve intrinsic motivation levels of staff. Findings in this study resonate with conclusions by Källander et al. [41] that participatory community engagement in health programmes has a positive association with staff motivation and retention outcomes. Källander et al. [41] arrived at this conclusion following a randomized control trial conducted in Uganda and Mozambique on the effect of innovative staff motivation and supervision approaches on community health worker performance and retention.

Similar studies in Ghana [36,42] and elsewhere [16,20,43,44] have added to the increasing relevance of mutual collaboration and engagement between communities and health providers. These empirical evidences reinforce the argument that non-financial incentives play a critical role in health worker motivation.

A study by Dill et al. [42] on motivation and challenges of community-based surveillance volunteers in northern Ghana found that the community was as a vital motivating factor for staff in terms of altruism, sense of duty to the community, gaining community respect and pride. Dill et al. [42] found that payment of financial rewards were not emphasized though recognised as vital to help attain basic needs. Similar studies on Ghana [5,7,45] indicated that even though health staff recognised monthly salaries as important work incentives, they often attributed their motivation and retention decisions to the desire to help the community.

As illustrated in this study, promoting community engagement in health has the potential to enhance staff experiences and work relationship with clients while encouraging better health seeking behaviour by clients. For instance, it was found that staff in intervention facilities experienced relatively lower cases of self-medication by clients than staff in control facilities (see Figure 1). Moreover, the average number of clients defaulting in treatment protocols per month was lower in intervention health facilities. Bhutta et al. [46] made similar observations following a community-based study in Pakistan; it was found that stillbirths and neonatal mortality rates reduced in two sub-districts where community-based strategies between healthcare providers and community members were implemented.

An important counter intuitive observation in this study was the high number of medical complications due to client late reporting and number of clients seeking care from informal caregivers (i.e. faith healers, spiritualists and traditional/alternate medicine practitioners). Although frequency of community outreaches per month had increased in both control and intervention facilities, the increases did not seem to translate into better health seeking behaviours of clients (see Figure 1). Perhaps these community outreaches have not been effective in addressing barriers to timely health service utilization.

Furthermore, challenges confronting the NHIS in recent times relating to delayed provider reimbursements [47,48] might explain the poor client health seeking behaviour. The delayed provider reimbursements have reportedly compelled some accredited healthcare providers to resort to co-payment especially for drugs and medical laboratory services [49]. This emerging phenomenon potentially reduced financial accessibility to formal healthcare hence reliance on informal caregivers for health services.

Informal caregivers appeared to be the first port of call for many community members who are only compelled to visit orthodox healthcare providers when their condition worsens. This poor health seeking behaviour of clients is partly attributed to poor staff attitudes and human relations with clients often induced by low motivation levels and morale at work [12,48-51].

Ohid et al. et al. [52] found that poor-quality health services and lack of programme support resulted in low uptake of HIV testing in rural Mozambique.

These findings denote that besides instituting stringent disciplinary actions against staff indulged in unprofessional practices it will be beneficial to promote mutual collaboration between clients and health providers through community engagement strategies.

Unfavourable work conditions, including non-financial incentives are also cited as key contributory factors for poor staff attitudes toward clients and unwillingness to work in rural deprived areas. A study involving 3,199 medical and nursing students in Asia and Africa found...
Chapter 6

intended a rural career after training [53]. As part of efforts to reverse this trend, more stringent staffing norms should be enforced to ensure that the right calibre of health trainees willing to accept postings to rural areas are recruited for training. Moreover, the WHO global code of practice on the International Recruitment of Health Personnel (2015) encourages under-staffed health systems to train and retain the health personnel they need to limit demand for international migration [54].

As shown in this study, staff monthly salaries and other financial incentives seemed to have improved overtime in nominal terms but this did not appear to influence positive client health seeking behaviour neither did it serve as a key source of motivation for staff (see Table 2). This observation contrasts anecdotal and some empirical [10,12] notions that financial incentives are the fundamental determinants of staff motivation and retention in Ghana.

Authors of this paper do not seek to advocate against financial incentives because they remain critical for attracting and retaining qualified health professionals to render quality healthcare services to clients [6,10,12]. The argument is that mainly depending on financial incentives as a strategy for motivating healthcare workers might be a challenging trajectory for Ghana to sustain in the midst of already constrained health budgets.

Considering the global differentials in financial incentives for health workers it is not likely Ghana can compete with the global health labour market to motivate and retain health workers [55] through wage increases alone hence the need to adopt a balanced approach. Albeit public sector wage bill accounts for over 90% of government domestic expenditure on health [47], staff productivity and quality of healthcare delivery remain a challenge [3,5,6,7].

In view of the above findings, there is the need to identify and execute non-financial work incentives to complement existing efforts towards enhancing staff motivation. In the past, attempts by the ministry of health in Ghana to use rural financial incentives to promote staff motivation did not yield the needed results and had to be curtailed for repackaging [55].

As demonstrated in this paper, non-financial work incentives such as cordiality with clients and co-workers formed an important basis for staff motivation in primary healthcare facilities.

Design and implementation of staff motivation packages should recognise that “wholesale” work incentives mainly based on financial rewards might not ultimately results in intrinsically motivated staff. Instead, staff motivation packages should be tailor-made to the peculiar needs of staff at various levels of the healthcare system.

Findings in this study should stimulate policy dialogues among relevant stakeholders of Ghana’s healthcare system on the prospects of using community engagement [56] to enhance staff intrinsic motivation levels and experiences with clients.

It is recommended that staff appraisal protocols for the public and private health sectors in Ghana should be discussed for possible reforms to enable community members provide feedback on staff performance and relationship with clients. Community engagement sessions at the community level could serve as the platform for these feedbacks and possibly count towards staff annual performance appraisal and subsequent promotion. This idea will help promote accountability and good working relationship with clients.

Existing community-based programmes such as the Community-based Health Planning and Services (CHPS) programme could constitute the framework for a pilot of the proposed community-based staff appraisal system. This proposal could be piloted on a small scale after wider stakeholder consultation to ascertain its feasibility and sustainability. Anonymity of the clients should be assured during appraisal to avoid potential intimidation.

As demonstrated in this study, the types of community groups engaged in the SCE interventions had associations with the staff motivation ratings. High intrinsic motivation levels were particularly associated with community artisan groups, female groups and groups with structured leadership. This positive association corroborates the assertion that females in Ghana turn to have more health needs and demand for healthcare services than males [56]. This implies females could be better assessors of healthcare quality because their encounter with healthcare staff is more frequent than their male counterparts.

Community group dynamics should be adequately explored when implementing the SCE concept to guarantee effectiveness and sustainability. The findings also suggest informal community groups with organised leadership are better options for effective SCE activities. Healthcare providers will most likely implement quality improvement recommendations from organised community groups than groups engaged in ad hoc activities without clear leadership structure.

Limitations

The study was conducted in clinics and health centres where relatively lower cadres of health staff work. It is possible staff experiences and motivation ratings reported in this paper were largely influenced by the focus on these staff. Work conditions are usually poorer in lower level health facilities than secondary and tertiary level facilities.

Furthermore, institutional and national level developments (beyond the control of this study) might have occurred between the baseline and follow-up period and possibly affect health staff experiences/motivation levels in healthcare facilities. Health facilities that were upgraded to higher level facilities during follow-up might have recorded higher numbers of clinic attendance which has the potential to influence motivation level and staff experiences in terms of workload and relationship with clients.

Moreover, interviewed health staff were not randomized into the intervention and control facilities hence predispousing the study to selection bias [30]. Cognizant of this potential bias, propensity score matching and difference-in-difference estimations were used to control the possible effect of covariates on staff responses and determine effect of the interventions. Overall, the authors acknowledge that this study would have been much stronger as a multiple methods research but limited financial resources and time did not permit extensive application of all relevant research methodologies.

Conclusion

Community-based approach to health worker motivation is a potential complementary strategy that needs policy deliberation to explore its prospects. Even though financial incentives remain
critical sources of motivation that should not be compromised, mainly depending on these incentives might not promote intrinsic motivation levels among staff as demonstrated in this study. Health workers’ commitment to quality healthcare delivery will most likely be enhanced when they are motivated intrinsically through mutual collaboration with clients.

Also, effective collaboration between healthcare providers and communities is needed to promote client trust and confidence in the formal healthcare system in Ghana and ultimately improve universal access to basic healthcare services. The critical role of female groups in promoting staff–client cordiality and relationships has been established in this study and should be explored in future studies and policy deliberations on health worker motivation strategies.

Acknowledgement/Funding
This study was conducted with the financial support of The Netherlands government through the Ministry Foreign Affairs and the Science for Global Development (WOTRO) which is a division of the Netherlands Organisation for Scientific Research (NWO), under the Global Health Policy and Systems Research (GHPHSR) programme (Funding/grant number: W07.45.104.00). Funding recipient: Noguchi Memorial Institute for Medical Research (NMIMR), University of Ghana Legon. International collaborators of this project include Amsterdam Institute for Global Health and Development (AIGHD), Netherlands; University of Amsterdam (UvA); Vrije University (VU), Amsterdam, Netherlands; University of Groningen, Netherlands. Local collaborators include: National Health Insurance Authority (NHIA), Ghana; Ministry of Health (MoH)/Ghana Health Service (GHS) and Christian Health Association of Ghana (CHAG).

Data Availability Statement
Data accessibility is not restricted but sharing of data will be done in accordance with the procedures of the Ghana Health Service (GHS) Ethical Review Committee (ERC) which granted ethical clearance prior to the conduct of the field work (Clearance Number: GHS-ERC: 18/5/11). The Ghana Health Service Ethical Review Committee can be contacted at: Tel. +233-0302-681109. The Project Principal Investigator (PI) (Prof Tobias Rinke de Wit), could also be contacted via E-mail (trinkedewit@aighd.org) and the Co-PI, Dr. Daniel Kojo Arhinful contacted via E-mail (Darhinful@noguchilug.edu.ug).

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CHAPTER 7

Perspectives of frontline health workers on Ghana’s National Health Insurance Scheme before and after community engagement interventions

Robert Kaba Alhassan, Edward Nketiah-Amponsah, Nicole Spieker, Daniel Kojo Arhinful, and Tobias F. Rinke de Wit

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BACKGROUND

Sustainable healthcare financing and universal access to healthcare are important health system goals of many countries globally. To promote attainment of these goals, many Lower and Middle Income Countries (LMICs) have resorted to Social Health Insurance (SHI) to finance healthcare. Ghana’s National Health Insurance Scheme (NHIS) is one such SHI policy introduced in 2003 (Act 650, 2003 amended Act 852, 2012).

The NHIS is currently operational in over 150 district offices nationwide with an active membership of 8.8 million, representing about 35% of the Ghanaian population, and over 90% of the disease burden of Ghanaians covered including medical emergencies and accidents [1]. Out of the 3,575 health facilities accredited by the National Health Insurance Authority (NHIA) as at 2012, 53.6% were owned by government; 39.8% by private-for-profit; 5.8% by mission/faith-based and 0.8% by quasi-government facilities [1].

Since its introduction, the NHIS has contributed to improved health service utilization and health outcomes [2-7]. Outpatient visits per capita improved from 0.37 in 1997 to 1.16 in 2013; likewise, percentage of skilled deliveries improved from 44.5% in 2006 to 55.0% in 2013 [8]. Notwithstanding these positive contributions, there are emerging concerns on the quality of health service delivery in NHIS-accredited health facilities [9-14].

Some literature suggest that introduction of the NHIS has contributed to increased doctor-patient ratios in the Northern region of Ghana from 1:8,805 in 2006 to 1:21,751 in 2011 while the nurse-patient ratio worsened from 1:279 in 2006 to 1:1,547 in 2011 [12]. It is also argued the NHIS has compounded challenges in client waiting times, quality of time spent per patient and staff attitude towards clients [14-15]. Delayed reimbursement of service providers, delayed production and issuance of membership cards and administrative lapses in NHIS district offices also remain substantial concerns to stakeholders of the NHIS in recent times [12,15].

Even though these challenges have been explored from clients’ perspectives in previous studies [3,5], not much is known of frontline health workers’ views on the NHIS. Moreover, not many known randomized cluster trials and related studies have been conducted on how community engagement interventions potentially influence frontline health workers’ experiences of the NHIS in Ghana although community participation in health service planning and implementation is a key principle in the Alma-Ata Declaration of 1978 [16].

Previous studies have demonstrated the relevance of community engagement in effective and sustainable implementation of health policies in Ghana [17-20] and other countries [21-26]. Client/community participation in quality service assessment in healthcare and health insurance facilities is conventionally limited to client satisfaction surveys albeit this strategy is increasingly proving ineffective because of potential biased assessment emanating from client intimidation [27]. Limitations of these conventional approaches underscore the need to complement existing strategies with structured community engagement interventions.

Morgan and Lifshay [28] cited in Alhassan et al. [29] defined community engagement in the context of public health as dynamic relationships and dialogue between community members and local health professionals with varying degrees of community and higher level health authorities’
involvement in decision-making and control. Community engagement is critical for sustainable and equitable health policies because community members best define and prioritize their health needs [23].

In this study, Systematic Community Engagement (SCE) interventions were designed and implemented for nearly one year to engage existing community groups and associations in the monitoring and assessment of quality service delivery in NHIS-accredited health facilities and NHIS district offices. For the purposes of this paper, results of the interventions are not discussed instead aggregate effect of the interventions on staff perceptions and experiences of the NHIS and its effects of quality health service delivery are evaluated. The hypothesis is that in health facilities and NHIS district offices where SCE is implemented, frontline health workers’ experiences and perspectives on the NHIS will be enhanced than staff in control facilities.

**METHODS**

**Study design, population and setting**

The study is a randomized cluster trial conducted in 64 NHIS-accredited clinics/health centres and 16 NHIS district offices in the Greater and Western regions of Ghana. Individual respondents were chosen from within each intervention and control groupings. The 64 facilities constitute about 5% of the 1,180 accredited clinics/health centres in Ghana [1]. Clinical and non-clinical frontline health workers with at least 6 months work experience were eligible to participate in the baseline and post intervention surveys. Randomized cluster trial was deemed appropriate because it is one of the most scientifically rigorous methods of hypothesis testing [30] and the gold standard trial for evaluating effectiveness of interventions while preventing selection bias [31].

**Design and implementation of SCE interventions**

Two categories of SCE interventions were implemented namely: MyCare (also called Intensive Engagement) and Light Engagement (LE). The LE intervention used existing community groups/associations to identify service delivery gaps in healthcare facilities and NHIS district offices. The MyCare component engaged clients and relevant stakeholders in a participatory process; the focus was on individual clients contrary to the group approach in the LE. Both categories of interventions were implemented and evaluated concurrently from June, 2013 to March, 2014. This paper emphasizes the LE arm of the SCE interventions because the MyCare intervention was implemented in only 6 out of the 32 intervention facilities.

The SCE interventions were implemented in 32 randomly selected clinics/health centres and their catchment area; of the 32 health facilities that were randomly picked to receive SCE, 26 were randomly assigned the LE intervention and 6 assigned the MyCare intervention. The remaining 32 health facilities were used as controls. In each region, NHIS district offices serving the intervention clinics/health centres were also assigned as proxy intervention NHIS district offices. Figure 1 illustrates the randomization into the control, LE and MyCare arms of the study. Moreover, detailed description of the LE and MyCare components of the SCEIs are presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Description of the Systematic Community Engagement (SCE) interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Light Engagement (LE) Intervention</strong></td>
</tr>
<tr>
<td>The LE intervention comprised of five steps that actively engaged clients in their communities to rate service quality in their nearest health facility and NHS district office using predefined quality service proxies. The five implementation steps are:</td>
</tr>
<tr>
<td><strong>Step 1:</strong> Recruitment and training of 52 facilitators, and identification of existing community groups/associations. One facilitator was assigned to each of the 52 community groups in the two study regions (26 in each region). Eligibility criteria for selection of community groups included: documented evidence of routine meetings (at least four times a year); regular meeting venue; clear leadership structure; non-partisan, and active membership not less than an intuitive number of ten (10). The community groups comprised of 22 religious/faith-based groups; 8 traders groups; 1 widows group; 3 community volunteers groups; 3 musician groups; 5 artisans groups and 11 youth groups. Average group size was 29 members (SD = 20).</td>
</tr>
<tr>
<td><strong>Step 2:</strong> First round of assessment of service quality based on group members’ most recent (at most 6 months) experiences with the intervention service providers. Service quality indicators at healthcare provider level were: attitude of staff; punctuality of staff; availability of drugs; information provision; opportunity for feedback. Indicators for the health insurer are: information provision; (re)enrolment; delivering what is promised, and opportunity for feedback. A proxy indicator called Net Promotor Score (NPS) was used to measure clients’ trust for service providers. During the assessment, community members were asked to rank their experiences of service quality on a Five point Likert scale ranging from 1 “Very disappointing” to 5 “Very satisfactory”, using a community score card. These same service quality indicators were used for the MyCare arm of the SCE interventions.</td>
</tr>
<tr>
<td><strong>Step 3:</strong> Regional level validation and feedback sessions to disseminate the group assessment findings with facility heads, clients and NHIA representatives. This platform provided the service providers the opportunity to recognise and accept gaps in healthcare quality and agree on quality improvement plans with timelines and responsible persons.</td>
</tr>
<tr>
<td><strong>Step 4:</strong> Follow-up on the service providers by facilitators (3 months after validation and feedback sessions) to ensure implementation of agreed action plans towards quality improvement.</td>
</tr>
<tr>
<td><strong>Step 5:</strong> Rewarding best performing health facilities after a second round of community assessment (approximately six months after the first assessment). A citation plaque of honour and a token financial incentive of about US$ 200.0 was awarded best performing facilities to encourage competition among peers towards quality improvement.</td>
</tr>
</tbody>
</table>
### Table 1: (Continued)

**Intensive Engagement (MyCare) Intervention**

This component of the SCE interventions was implemented within the catchment area of intervention health facilities using a cyclical process involving clients, health care providers, and the NHIS district offices. Implementation of the MyCare arm of the SCE interventions involved six (6) cyclical steps namely:

**Step 1:** Recruitment and training of facilitators for the intervention activities.

**Step 2:** Semi-quantitative process where 30-50 clients (with evidence of NHIS active membership) were recruited at the exit of the intervention health facilities and later interviewed at home. Assessment of service quality focused on 10 predefined indicators related to service quality at the levels of the healthcare provider and health insurer (see LE interventions described earlier).

**Step 3:** Qualitative validation and feedback on semi-quantitative data with community representatives. Six (6) focus group discussions (1 in each catchment area) were conducted to discuss findings of the semi-quantitative interviews and action points taken to address identified service quality gaps.

**Step 4:** Briefing: intervention clinics and NHIS district offices were briefed on clients’ experiences of service quality.

**Step 5:** Joint stakeholder meeting where representatives of clients/community, healthcare providers, health insurers and regional/district level policy makers were invited to discuss and address identified gaps; a liaison person at the community follows up on the service providers to ensure action plans towards quality improvement are implemented.

**Step 6:** Progress qualitative phase where clients are followed-up six (6) months after the joint stakeholder meeting to determine perceived changes in service quality. Service providers perceived to have improved were rewarded with financial incentives and a citation plaque of appreciation.

<table>
<thead>
<tr>
<th>GHANA Clinics (n=64)</th>
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<tbody>
<tr>
<td>GAR clinics (n=32)</td>
</tr>
<tr>
<td>MyCare (n=3)</td>
</tr>
<tr>
<td>Controlled (n=16)</td>
</tr>
<tr>
<td>Randomized SCE (n=13)</td>
</tr>
<tr>
<td>MyCare (n=3)</td>
</tr>
<tr>
<td>Controlled (n=16)</td>
</tr>
</tbody>
</table>

**Figure 1:** Interventions design and randomization

**Sampling procedures**

The Greater Accra and Western regions were purposively sampled for rural-urban balance since the former is predominantly urban and the latter largely rural; 333 questionnaires were randomly administered to frontline health workers in all 64 sampled health facilities during the baseline survey in 2012. Out of this number, 324 questionnaires were correctly filled and returned representing 97% return rate; 320 questionnaires were administered during follow-up in 2014 and out of this number, 308 were correctly filled and returned, representing 96% return rate. Out of the 308 follow-up respondents, 234 were initially interviewed at baseline. Drop-out staff could not be followed because of transfers, deaths, resignations and retirements.

**Data collection**

Structured questionnaires consisting of open and close ended questions were used for the data collection before and after the SCE interventions. Questionnaires were administered by trained research assistants for nearly one month in the two study regions. During the interviews, respondents were asked questions related to their age, gender, education, professional category, work experience, religion, monthly salary, and health insurance status. Respondents were also asked to rank their perceptions on the NHIS based on pre-defined indicators on a Likert scale of 1 = “very disappointing” to 4 = “very excellent”. Questions were also asked on perceived impact of the NHIS on quality service delivery based on a scale of 1 = “very large extent” to 4 = “very little extent”.

To ensure effect of the interventions were appropriately evaluated, staff perception questions were similar to the indicators used for the SCE. Thus, quality service markers such as staff attitudes, information provision, client waiting times, NHIS enrolment and renewal process and feedback systems were rated by health staff before and after the interventions.

Piloting of data collection instruments was done in two health facilities in the Greater Accra region and were found to be acceptable and feasible for full-scale implementation.

**Statistical analysis**

All data sets were analysed with the STATA statistical software (version 12.0) after data cleaning and coding to anonymize the responses. Only responses of health workers (n = 234) successfully interviewed during baseline and follow-up surveys were maintained for the final analysis (i.e. 468 pooled responses); all analysis were done on “intention to treat” basis.

Socio-demographics and work characteristics of respondents were estimated using proportions; Pearson Chi-square test and paired t-test were used as appropriate to determine the differences in these socio-demographic characteristics among staff interviewed in intervention and control groups.

The main outcome variables of interest in the analysis were staff perceptions on the NHIS and its impact on quality service delivery. These outcome variables were derived from 28 Likert scale questions (i.e. 19 questions on staff experiences with NHIS and 9 questions on perceived impact of NHIS on quality health service delivery); the average scale reliability coefficient was tested and found to be 0.77, above the 0.70 rule of thumb [32]. Reverse coding was done for the
Lilert scale ranging from 1 = "very large extent" to 4 = "very little extent" because some questions were posed in the negative [32]. Higher summed scores thus depict positive perceptions of staff and vice versa. Coding for the Likert scale of 1 = "very disappointing" to 4 = "very excellent" was maintained.

The 28 Likert scale questions were factor-analysed into 8 perception variables using principal component factor analysis with varimax rotation (Kaiser off). The perception variables were predicted and named as follows: factor1 = "Feedback channels and stakeholder engagement"; factor2 = "Information provision, adequacy and accessibility"; factor3 = "Availability and quality of drugs covered by NHIS"; factor4 = "Reimbursements and benefits package"; factor5 = "Trustworthiness and complaint handling"; factor6 = "Workload and impact on health resources"; factor7 = "Client waiting time and queuing system"; and factor8 = "Quality of time spent per client".

To determine effect of the SCEIs on respondents' perceptions, difference-in-difference (DiD) estimations and propensity score matching (nearest neighbour algorithm) were performed using the pooled baseline and follow-up data \( (n = 468) \). DiD test was performed to ascertain the mean perception differences among staff in intervention and control facilities using the pooled baseline and follow-up datasets [33].

Even though the study design is randomized cluster trial, the psmatch2 was employed to determine the treatment effect of the SCE on staff perception variables [34]. This approach was deemed necessary because the staff were not randomly assigned to treatment and control facilities which has the potential to introduce selection bias [35]. Randomization into control and intervention groups was done at the health facility level, not the staff level. Hence, staff who by chance were found in intervention or control clinics were interviewed at random. Potential effect of covariates such as staff gender, age, education, professional category, monthly salary, insurance status, marital status, religious affiliation, clinic location (rural/urban), and clinic ownership (private/public) were accounted for in the estimations.

RESULTS

Profile of health workers

Out of the 324 staff interviewed at baseline, 234 (72%) were successfully interviewed at follow-up. The pooled baseline and follow-up responses were therefore 468 comprising 253 (54%) from the control group and 215 (46%) from intervention group. The proportion of females dominated among the 468 respondents in the intervention (60.5%) and control groups (69.6%) \( (P < 0.05) \). Likewise, the proportion of staff who had at least tertiary education was higher in intervention (72.1%) and control (79.4%) groups \( (P < 0.1) \).

Majority of the staff interviewed in intervention (61%) and control (70%) health facilities belonged to a professional association \( (P < 0.1) \). A significant proportion of the staff interviewed in intervention facilities also worked in privately owned health facilities while majority of the staff interviewed in control health facilities also worked in public/government owned facilities \( (P < 0.05) \). There were no statistically significant differences between intervention and control facilities in terms of staff professional category; marital status; religious affiliation; monthly salary and health insurance status (see Table 2).

Table 2: Profile of health workers interviewed in intervention and control facilities

<table>
<thead>
<tr>
<th>Staff characteristics</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>Mean (Std. Dev.)</td>
<td>Mean (Std. Dev.)</td>
</tr>
<tr>
<td>Males</td>
<td>468</td>
<td>39.5 (33.0)</td>
</tr>
<tr>
<td>Females</td>
<td>605</td>
<td>53.9 (67.0)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
<td>Mean (95% CI)</td>
<td>Proportion (95% CI)</td>
</tr>
<tr>
<td>Below tertiary</td>
<td>468</td>
<td>27.9 (21.9)</td>
</tr>
<tr>
<td>Tertiary</td>
<td>721</td>
<td>66.1 (78.1)</td>
</tr>
<tr>
<td>Professional category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical staff</td>
<td>468</td>
<td>74.4 (60.6)</td>
</tr>
<tr>
<td>Non-clinical staff ²</td>
<td>25.6 (19.7)</td>
<td>31.4 (23.7)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>465</td>
<td>42.9 (37.2)</td>
</tr>
<tr>
<td>Not married</td>
<td>561</td>
<td>49.4 (62.8)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>466</td>
<td>96.7 (94.3)</td>
</tr>
<tr>
<td>Other</td>
<td>3.3 (0.9)</td>
<td>4.4 (1.8)</td>
</tr>
<tr>
<td>Monthly salary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;GHC 1,300</td>
<td>458</td>
<td>7.1 (3.6)</td>
</tr>
<tr>
<td>&lt;GHC 1,300</td>
<td>929</td>
<td>98.9 (69.5)</td>
</tr>
<tr>
<td>Belong to professional association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>320</td>
<td>61.0 (52.9)</td>
</tr>
<tr>
<td>No</td>
<td>390</td>
<td>50.9 (47.1)</td>
</tr>
<tr>
<td>Region of work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater Accra</td>
<td>468</td>
<td>51.2 (44.4)</td>
</tr>
<tr>
<td>Western</td>
<td>408</td>
<td>42.1 (55.6)</td>
</tr>
<tr>
<td>Clinic ownership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>468</td>
<td>59.1 (52.5)</td>
</tr>
<tr>
<td>Public</td>
<td>409</td>
<td>43.4 (47.5)</td>
</tr>
<tr>
<td>Health insurance status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insured</td>
<td>452</td>
<td>76.4 (70.6)</td>
</tr>
<tr>
<td>Uninsured</td>
<td>236</td>
<td>21.7 (17.8)</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEISIN Ghana Project (2014). *Pearson Chi-square test significant \( (P < 0.05) \); **Pearson Chi-square test significant \( P < 0.1 \).

*Mean testing done with the paired t-test at 95% confidence level.

²Observations are the pooled responses of staff at baseline and follow-up

¹Staff who performed clinical roles; ²staff who performed non-clinical roles
Staff experiences and perceptions on Ghana’s NHIS

Experiences of health workers with some service components of the NHIS appeared to have worsened over time in both intervention and control facilities: the percentage of staff satisfied with the timeliness of provider reimbursement decreased from approximately 14% in 2012 to less than 10% in 2014. Perceptions on the NHIS accreditation and information dissemination, however, improved marginally (see Figure 2).

Impact of interventions on staff perceptions of service quality

Difference-in-difference estimation results suggest the interventions impacted more positively on perceived availability and quality of drugs covered by the NHIS, contrary to anecdotal reports suggesting otherwise. In Table 3, we reported more positively perceived effect of the NHIS on availability and quality of drugs covered by the NHIS, with an average perception score in intervention clinics of 2.71 (SD = 0.20) compared to 2.51 (SD = 0.20) in controls (P <0.05) (see Table 3). Percentage data of the NHIS

![Figure 2: Health workers views on the NHIS in intervention and control clinics](image)

Table 3: Differences in health worker views on the NHIS in treatment and control facilities

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Treated</td>
<td>Diff(BL)</td>
</tr>
<tr>
<td>Perspectives on NHIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feedback channels</td>
<td>1.10 (0.15)</td>
<td>1.04 (0.16)</td>
<td>-0.06 (0.09)</td>
</tr>
<tr>
<td>Information provision</td>
<td>1.67 (0.21)</td>
<td>1.63 (0.21)</td>
<td>-0.04 (0.09)</td>
</tr>
<tr>
<td>Reimbursements and benefits package</td>
<td>1.50 (0.22)</td>
<td>1.47 (0.22)</td>
<td>-0.03 (0.09)</td>
</tr>
<tr>
<td>Trustworthiness and complaint handling</td>
<td>2.20 (0.19)</td>
<td>2.16 (0.19)</td>
<td>-0.04 (0.09)</td>
</tr>
<tr>
<td>Overall perception score</td>
<td>2.20 (0.19)</td>
<td>2.16 (0.19)</td>
<td>-0.04 (0.09)</td>
</tr>
</tbody>
</table>

NHIS impact on quality healthcare

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Workload and impact on health resources</td>
<td>2.01 (0.21)</td>
<td>2.00 (0.21)</td>
<td>-0.01 (0.09)</td>
</tr>
<tr>
<td>Client waiting time and queueing system</td>
<td>0.97 (0.01)</td>
<td>0.97 (0.01)</td>
<td>-0.00 (0.01)</td>
</tr>
<tr>
<td>Quality of time spent per client</td>
<td>1.39 (0.09)</td>
<td>1.39 (0.09)</td>
<td>-0.00 (0.01)</td>
</tr>
<tr>
<td>Overall perceived impact</td>
<td>1.53 (0.13)</td>
<td>1.52 (0.13)</td>
<td>-0.01 (0.09)</td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEiSION Ghana Project (2014). Diff-in-diff estimates*P <0.1; **P <0.05. Note: Means and SE are bootstrapped and estimated by linear regression & all mean and SE values rounded up to the nearest decimal.

Legend: SE=Standard Error; FU=Follow-up survey; BL=Baseline survey

Motivation factors have been factor-analysed

Observations are the pooled responses of staff at baseline and follow-up survey.
on increased workload on health staff and infrastructure appeared to have improved among respondents in intervention facilities (P < 0.1); likewise, client waiting and quality of time spent per client were perceived more positively by staff in intervention facilities than those in control facilities (see Table 3).

Table 4: Model specification for propensity score matching using pooled 2014 & 2012 data (n = 468)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Variable definition</th>
<th>Intervention n = 215 (46%)</th>
<th>Control n = 253 (54%)</th>
<th>Difference in means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCE/NSCE</td>
<td>1 if SCE clinic; 0 otherwise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perception factor1</td>
<td>Perception factors (factor-analysed)</td>
<td>1.92 ± 0.67</td>
<td>1.94 ± 0.61</td>
<td>0.02</td>
</tr>
<tr>
<td>Perception factor2</td>
<td></td>
<td>2.43 ± 0.58</td>
<td>2.46 ± 0.52</td>
<td>0.03</td>
</tr>
<tr>
<td>Perception factor3</td>
<td></td>
<td>2.55 ± 0.70</td>
<td>2.53 ± 0.65</td>
<td>-0.02</td>
</tr>
<tr>
<td>Perception factor4</td>
<td></td>
<td>1.74 ± 0.53</td>
<td>1.79 ± 0.49</td>
<td>0.05</td>
</tr>
<tr>
<td>Perception factor5</td>
<td></td>
<td>2.48 ± 0.62</td>
<td>2.48 ± 0.56</td>
<td>-0.00</td>
</tr>
<tr>
<td>Overall score</td>
<td></td>
<td>2.26 ± 0.26</td>
<td>2.30 ± 0.41</td>
<td>0.04</td>
</tr>
<tr>
<td>Perceived impact1</td>
<td></td>
<td>2.09 ± 0.56</td>
<td>1.94 ± 0.57</td>
<td>-0.15**</td>
</tr>
<tr>
<td>Perceived impact2</td>
<td></td>
<td>1.18 ± 0.49</td>
<td>1.13 ± 0.36</td>
<td>-0.05</td>
</tr>
<tr>
<td>Perceived impact3</td>
<td></td>
<td>1.38 ± 0.59</td>
<td>1.31 ± 0.49</td>
<td>-0.07</td>
</tr>
<tr>
<td>Overall score</td>
<td></td>
<td>1.73 ± 0.39</td>
<td>1.62 ± 0.38</td>
<td>-0.11**</td>
</tr>
<tr>
<td>Independent variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>Staff age in years</td>
<td>37.4 ± 13.1</td>
<td>37.6 ± 13.1</td>
<td>-0.13</td>
</tr>
<tr>
<td>Gender</td>
<td>1 if male; 0 otherwise</td>
<td>0.40 ± 0.49</td>
<td>0.30 ± 0.46</td>
<td>0.09**</td>
</tr>
<tr>
<td>Education</td>
<td>1 if secondary education; 0 otherwise</td>
<td>0.28 ± 0.45</td>
<td>0.21 ± 0.40</td>
<td>0.07*</td>
</tr>
<tr>
<td>Profession</td>
<td>1 if non-clinical staff; 0 otherwise</td>
<td>0.26 ± 0.44</td>
<td>0.24 ± 0.44</td>
<td>0.02</td>
</tr>
<tr>
<td>Salary</td>
<td>1 if is &gt;GHC 1,300; 0 otherwise</td>
<td>0.07 ± 0.26</td>
<td>0.10 ± 0.30</td>
<td>-0.03</td>
</tr>
<tr>
<td>Marital status</td>
<td>1 if married; 0 otherwise</td>
<td>0.44 ± 0.50</td>
<td>0.45 ± 0.50</td>
<td>-0.01</td>
</tr>
<tr>
<td>Religion</td>
<td>1 if Christian; 0 otherwise</td>
<td>0.97 ± 0.18</td>
<td>0.96 ± 0.20</td>
<td>0.01</td>
</tr>
<tr>
<td>Facility location</td>
<td>1 if GAR; 0 otherwise</td>
<td>0.51 ± 0.50</td>
<td>0.52 ± 0.50</td>
<td>0.01</td>
</tr>
<tr>
<td>Facility ownership</td>
<td>1 if private clinic; 0 otherwise</td>
<td>0.59 ± 0.49</td>
<td>0.47 ± 0.50</td>
<td>-0.12**</td>
</tr>
<tr>
<td>Insurance status</td>
<td>1 if insured; 0 otherwise</td>
<td>0.76 ± 0.43</td>
<td>0.78 ± 0.41</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 5: Effect of community engagement interventions on health worker perceptions (n = 468)

<table>
<thead>
<tr>
<th>Matching algorithm</th>
<th>Outcome Indicators</th>
<th>**ATT (T-stat)</th>
<th>SE</th>
<th>Number of Intervention</th>
<th>Number of Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearest Neighbour (NN)</td>
<td>Perception factor1</td>
<td>1.94 (-0.26)**</td>
<td>0.080</td>
<td>194</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td>Perception factor2</td>
<td>2.46 (-0.71)</td>
<td>0.165</td>
<td>36</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>Perception factor3</td>
<td>2.56 (-0.25)**</td>
<td>0.089</td>
<td>200</td>
<td>229</td>
</tr>
<tr>
<td></td>
<td>Perception factor4</td>
<td>1.72 (-1.37)*</td>
<td>0.099</td>
<td>98</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>Perception factor5</td>
<td>2.48 (-0.46)**</td>
<td>0.082</td>
<td>194</td>
<td>218</td>
</tr>
<tr>
<td>Overall</td>
<td>2.24 (0.13)</td>
<td>0.178</td>
<td>21</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Perceived impact1</td>
<td>2.07 (2.60)**</td>
<td>0.074</td>
<td>198</td>
<td>223</td>
<td></td>
</tr>
<tr>
<td>Perceived impact2</td>
<td>1.18 (1.36)**</td>
<td>0.062</td>
<td>201</td>
<td>223</td>
<td></td>
</tr>
<tr>
<td>Perceived impact3</td>
<td>1.38 (1.44)**</td>
<td>0.067</td>
<td>201</td>
<td>224</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>1.72 (3.66)**</td>
<td>0.052</td>
<td>198</td>
<td>221</td>
<td></td>
</tr>
</tbody>
</table>

Source: WOTRO-COHEISSION Ghana Project (2014); *P < 0.05; **P < 0.01
**ATT (Average treatment effect on the treated). The ATT values are the propensity score matching output and they depict the impact of the treatment (SCE interventions) on each of the staff motivation markers, high values imply higher treatment effect and vice versa.

Legend: SE (Standard Error); Perception factor1 (Feedback channels and stakeholder engagement); Perception factor2 (Information provision, adequacy, accessibility); Perception factor3 (Availability and quality of drugs covered by NHIS); Perception factor4 (Reimbursements and benefits package); Perception factor5 (Trustworthiness and complaint handling);
Overall perception (Overall score based on all five perception variables). Perceived impact1 (Workload and health resource); Perceived impact2 (Client waiting time and queuing system); Perceived impact3 (Quality of time spent per client); Overall perceived impact (Overall score based on all 3 perception variables on impact of NHIS on quality health service delivery).

DISCUSSION

Quality of services in NHIS-accredited health facilities and NHIS district offices, coupled with delayed reimbursement of service providers and administrative lapses remain critical challenges that have the potential of decreasing stakeholders’ trust and confidence in Ghana’s NHIS [10-14,34,35].

Bottom-up engagement of clients, healthcare providers and health insurance managers could be a possible strategy towards improving service quality at the health facility and district NHIS office levels. The results of this study suggest that SCE in service quality assessment could help...
enhance stakeholders’ perspectives on the NHIS and promote their goodwill, interest and support for
NHIS activities. It was found that the average perception scores of respondents on the NHIS
significantly improved after implementation of the SCE interventions (see Tables 3 & 5).

The interventions appeared to have enhanced perspectives on many components of the NHIS
except delayed reimbursement of service providers, thus corroborating findings by Dalinjong and
Laar [15] and Fusheini et al. [36] on this administrative challenge. Reports of provider claims
being in arrears for several months [22] were confirmed in this study.

Even though NHIS reimbursements continue to be a key cost driver of the NHIA (escalating
from US$ 3.4 in 2005 to nearly US$ 318 million in 2012 [1]), it appears the financial resources
are inadequate and possibly constitute a cause of the delayed payment of service providers. The
SCE had limited capacity to influence timely reimbursement of service providers which perhaps
explains the apparent low influence on respondents’ perceptions.

The NHIA (regulatory body of the NHIS) established three zonal Claims Processing Centres
(CPCs) with computerized claims vetting processes as part of efforts towards addressing the
challenge of delayed reimbursements. Other strategies include routine reminders to accredited
health facilities to submit claims on time and pick up payment cheques [1].

Proposals have also been made for review of the benefits package, and exemption list
which are argued to be too generous and unsustainable [20]. Expansion of the NHIS revenue
sources to include road tax, “sin” tax (i.e. tobacco and alcohol taxes) and petroleum revenue
tax are being advocated to guarantee financial viability and early payment of service providers
[10]. Comprehensive stakeholder consultation and policy dialogues could help explore the
opportunities and potential challenges in implementing these proposals.

Frontline health workers’ perceptions on the adequacy of information dissemination by the
NHIA improved marginally in both intervention and control facilities suggesting the need for
intensified efforts in information dissemination strategies. The NHIA introduced a national call
centre in 2013 to address clients and service providers’ grievances on the NHIS. According to
the NHIA, mass media campaigns to promote information accessibility to stakeholders have also
been intensified [1]. Impact of these interventions on improved service quality however remain
scientifically unproven.

The perceived impact of NHIS on quality health service delivery was found to have improved,
particular among staff working in intervention health facilities (P <0.05). Similar studies on
impact of community engagement on quality healthcare in Ghana [29] and health insurance in
South Africa [22], Burkina Faso [24,37], Rwanda [38] and Brazil [25] underscore the relevance
of community engagement in health programmes including health insurance. Indeed, the African
Union (AU) endorsed community engagement for health systems in Africa towards attaining
sustainable and equitable health programmes [39].

These revelations demand increased political will to ensure full engagement of communities
and relevant stakeholders in health and insurance programmes. Perhaps, appraising performance
of district and regional health administrations based on the level of community engagement in
health provision could promote the concept. Likewise, evaluating performance of municipal and
district assemblies (M&DAs) and members of parliament (MPs) based on the level of community

engagement in health in their districts and constituencies could enhance political will and
commitment.

The SCE interventions are potentially scalable and sustainable since they do not demand huge
financial commitment. Approximately US$ 380.0 can conduct a round of SCE within the year. This
modest financial commitment can easily be accommodated by monitoring budgets of the District
Health Management Teams (DHMTs) and NHIS district offices [1].

Policy makers at the NHIA and Ministry of Health (MoH) levels could initiate discussions on
possibly piloting and scaling up the SCE concept, preferably in the northern and middle belts of
the country. The SCE concept could contribute towards empowering communities and creating a
common platform for relevant stakeholders to deliberate on challenges and achievements of the
NHIS and healthcare system at large.

National health policy direction on structured community engagement in health could help
promote service provider accountability to clients and communities which would likely culminate
in enhanced trust in the healthcare system and ultimately stimulate active participation in the
NHIS and promote the pursuit for universal health coverage.

Limitations
This study was conducted in clinics/health centres whose frontline workers might have
significantly different perceptions and experiences of the NHIS from those working in bigger
health facilities. Moreover, the study was conducted in two (2) out of ten (10) regions in the better
endowed southern Ghana. Perhaps perspectives of health workers in the less endowed northern
sector might be significantly different. Conclusions should therefore be interpreted with respect
to validity for other regions and higher level healthcare facilities.

Moreover, given the time lag (2 years) between the baseline and follow-ups surveys, it is possible
some institutional and national level developments (beyond the control of this study) might have
influenced the health staff perspectives on the NHIS besides the impact of the interventions.
For instance, upgrading of some clinics/health centres to hospitals during follow-up could have
affected, service delivery, human and material resource capacity and workload in these pertinent
health facilities and hence impact on staff experiences and perceptions.

Conclusions
Frontline health workers’ perceptions on the NHIS and its impact on quality health service
delivery are predominantly positive especially in intervention health facilities. However, majority
of staff expressed disappointment in delayed reimbursement of service providers implying the
need for intensified efforts by NHIA and Government of Ghana (GoG) to ensure timely release of
funds from the statutory National Health Insurance Fund (NHIF). Proposals for additional sources
of revenue for the NHIS should also be discussed and possibly adopted to address this perennial
challenge.

As demonstrated in this study, effective community engagement and stakeholder consultation
is a viable strategy worth considering by policy makers to help promote stakeholder participation
and support for the NHIS in Ghana. Accelerated political will and policy dialogues could help prioritize this proposal in the national agenda.

Ethical considerations

Ethical clearance for the study was obtained from the Ghana Health Service (GHS) Ethical Review Committee (ERC) [clearance numbers: GHS-ERC: 18/5/13 and GHS-ERC 08/5/11]. Written informed consent was also obtained from the individual subjects.

Funding

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Availability of data and materials

All data supporting our findings is contained in the manuscript. There are no restrictions to data sources per se but details of the full data may be accessed through the Principal Investigator (PI), Prof. Tobias F Rinke de Wit (Amsterdam Institute for Global Health and Development University of Amsterdam Postal Address: Pietersberweg 17; 1105 BM Amsterdam. The Netherlands; E-mail: t.rindewit@aighd.org) and the Co-PI in the person of Dr. Daniel Kojo Arhinful (Noguchi Memorial Institute for Medical Research, University of Ghana Legon. PO Box LG 583, Legon; E-mail: DARhinful@noguchi.ug.edu). A

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160 | Chapter 7 Perspectives of workers on Ghana’s NHIS | 161


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“Patient-centred healthcare and patient engagement are no longer “nice-to-have” ideas but truly at the core of healthcare mandates, programmes and initiatives....”

— Durhane Wong-Rieger, International Alliance of Patients’ Organisation’s (IAPO), 2007-2016
Efforts towards attaining universal health coverage (UHC) have been intensified globally with varying degrees of successes in individual countries. According to the World Health Organisation (WHO), resource poor countries mostly in Africa and Pacific Asia are yet to make significant gains in universal access to basic quality healthcare services [1,2]. An estimated 100 million people are pushed below the poverty line annually because of huge financial cost of healthcare [3]. In sub-Saharan Africa and southern Asia, only 5-10% of people are covered by health insurance while in middle income countries the rates range between 20% and 60% [3].

Ghana was the first country in sub-Saharan Africa (SSA) to introduce a national health insurance scheme (NHIS) in 2003 [4,5]. In the year 2004, the NHIS became fully operational nationwide replacing a system of paying out-of-pocket (OOP) for healthcare services. After a decade of the NHIS existence, some significant successes have been recorded with over 40% of the estimated 26.9 million Ghanaian population in active membership [5]. Following introduction of the NHIS, some health outcome indicators have improved partly due to the enhanced financial accessibility induced by the NHIS [6-8].

Health insurance is increasingly becoming a promising intervention for achieving UHC [3,6,9,10]. Besides Ghana, countries such as Kenya, Rwanda, Nigeria, Burkina Faso, Senegal and Ethiopia have gone through major UHC reforms geared towards reducing catastrophic household expenditure on health [3,9,10]. Likewise, Brazil, Chile, China and Mexico have made significant strides in addressing inequities in access to basic healthcare services through health insurance interventions [3].

Trust in health insurance schemes through client-centred quality services is an imperative strategy to promote health insurance sustainability, especially in lower middle income countries (LMICs) where access to quality healthcare remains a challenge [1,3,11-13]. Ghana, South Africa, Nigeria and Uganda have suffered severe setbacks in their health insurance systems due to challenges of trust, poor service quality, and inadequate stakeholder engagement [14-24]. Moreover, health insurance initiatives in Africa often run the risk of total collapse because of weak state institutions aggravated by limited human and material health resources [9,25].

Besides the challenge of trust in healthcare and insurance services, shortage of health sector human resources is a major impediment to attaining UHC in Africa [26-29]. Africa alone hosts approximately 25% of the global disease burden yet has only 3% of the world’s doctors [30,31]. Papers in this thesis [16,32] and related works in Ghana [33-36], Nigeria [20] and Burkina Faso [18,37] have shown that inadequate numbers of qualified and motivated health staff induce poor service quality to clients and potentially decrease utilization of healthcare services.

The WHO projects a growing shortfall of 18 million health workers required to achieve the sustainable development goals (SDGs) by 2030, mainly in LMICs [38]. Unabated migration of health workers from poorer countries to developed countries for better working conditions is expected to worsen the health sector human resource situation in LMICs including Ghana. According to the WHO, between 2013 and 2014 an estimated one million foreign trained doctors and nurses were working in Organisation for Economic Cooperation and Development (OECD) member countries, accounting for 17% and 6% of the world’s doctors and nurses respectively [38].

These statistics suggest the need for timely health sector human resource development (HRD) reforms that effectively combine financial and non-financial incentives for health workers to promote retention and optimal performance output. As part of efforts to accelerate progress toward UHC and attainment of the SDGs, the WHO reviewed a global strategy on human resources for health for consideration by the World Health Assembly in May, 2016. Member countries, including Ghana, are expected to adopt relevant protocols in the WHO strategy document to meet country-specific demands. Moreover, Ghana’s national policy on health sector HRD [39] constitutes an important blueprint to guide policy reforms on health worker motivation and performance improvement.

Based on findings in this thesis, possible policy directions for health sector HRD and staff motivation in Ghana include increased commitment to equitable allocation and distribution of health resources to bridge existing rural-urban gaps; more effective tailor-made staff motivation packages (not necessarily financial) to address peculiar challenges of health workers in different work environments; integration of innovative health worker motivation strategies into mainstream quality improvement guidelines, especially in public health facilities where work conditions and quality healthcare are perceived to be lower [32-33,35,40]. A review of the 2005 national health sector HRD policy document will also help address emerging health worker motivation challenges and bridge widening gaps in health infrastructure and career development opportunities for health workers in rural and urban areas [26,29,32,41].

Apart from our studies on health worker motivation, we explored perceived and medical technical quality healthcare in 64 health facilities and over 1,900 households. It was found that clients’ definition and perceptions of healthcare quality were different from healthcare professionals and technical measures of quality healthcare. Perception gaps between staff and clients were found in the areas of compassion and supportiveness of staff; respectfulness of staff; equal treatment for insured and uninsured clients and waiting times. While health staff generally perceived these quality healthcare proxies to be satisfactory, clients expressed dissatisfaction. The findings appear to confirm conclusions in previous client satisfaction surveys in Ghana [18,37,40] and elsewhere [42,43].

We observed that mainly improving medical technical quality healthcare standards did not necessarily translate into optimal client satisfaction with healthcare quality and willingness to utilize health services. These findings corroborate results in previous studies suggesting clients’ perception of health service quality is an important determinant of health service utilization in Ghana [33,35,36,44] and Burkina Faso [18]. Health managers and policy makers therefore need to balance their commitment to technical and perceived quality healthcare dimensions to promote mutual trust among clients and healthcare professionals. Even though adherence to professional protocols and standards is critical towards guaranteeing patient safety, these efforts should be pursued concurrently with client-centred quality healthcare services.

Effectively incorporating perceived and technical quality healthcare dimensions into mainstream monitoring and evaluation (M&E) tools of the Ghana Health Service (GHS) and National Health Insurance Authority (NHIA) will help attain a comprehensive client-centred healthcare system in Ghana. Client-centred quality improvement strategies have been successfully
piloted in some SSA countries [45] and South Africa [46,47] where community members were actively involved in healthcare quality assessment. Ghana could learn from the experiences of these countries and complement them with existing tenets of the GHS Institutional Care Division (ICD) quality assurance framework [48].

In line with this idea, the NHIA could consider piloting performance-based financing (PBF) for accredited health facilities to increase commitment to client-centred quality healthcare. In our post intervention surveys we found that intervention health facilities that received financial incentives as part of the community engagement interventions performed better in both medical technical and perceived quality healthcare indicators [16]. In view of this, PBF could be piloted in selected regions to determine the prospects and possible challenges associated with this quality improvement option.

Public private partnership (PPP) in health is one strategy that is being advocated to promote universal access to quality healthcare [10,49-50]. Many LMICs are yet to realise full benefits of PPP interventions in health but countries like India [5] and Vietnam [52-54] have recorded some successes in PPP implementation. Even though Ghana has a national policy on PPP for all sectors including health [55], full potentials in PPP are yet to be fully realised especially in service quality improvement.

PPP has become a compelling option for resource poor countries because public healthcare providers are overwhelmed by the increasing demand for health services. In light this, policy makers in LMICs could leverage the increasing numbers of private sector health providers to complement governments’ efforts in health service provision. In Ghana like many countries in SSA, over 50% of healthcare services are rendered by private providers including licensed chemical sellers and informal care givers [56]. Despite there are challenges associated with private sector involvement in health service provision [57-59], existing opportunities in private healthcare providers need to be explored.

Also, increased commitment to effective leadership development programmes (LDPs) and continuous professional development (CPD) in client-centred services for health personnel and insurance officers could build local capacity, reduce administrative lapses and help close existing quality healthcare gaps. Moreover, active involvement of community members and healthcare providers at various levels of the healthcare system by NHIA is a possible means to promote goodwill and collaboration by relevant stakeholders. We found in our post intervention studies that assessment of health and insurance services by community members enhanced provider accountability to clients [16]. Pakistan [60], South Africa [46,47], and Burkina Faso [37,45] have successfully piloted community engagement models in health and Ghana could learn lessons from these countries to complement existing community engagement interventions [61-65]. Furthermore, the MoH should institutionalize effective customer care training for health trainees and health professionals in service to instil in them client-centred care practices.

Adopting m-Health and e-Health solutions in service quality improvement could promote timely response to clients’ complaints. Existing national policies on health sector information communication technology (ICT) and e-Health [66,67] are important frameworks that should be leveraged to promote client-centred healthcare and insurance services.

Successful implementation of m-Health initiatives in Ghana like the Mobile Technology for Community Health (MOTECH) [68-71] should motivate more electronic and mobile-based client appointment systems, complaint lodging, electronic medical records keeping and health information reporting. These innovations could control systemic challenges of long waiting times and limited complaint avenues in health facilities. It is important to submit that m-Health and e-Health solutions were not the prime focus of this thesis thus these recommendations are largely informed by reviewed literature conclusions on the subjective matter in Ghana.

Another policy direction will be the need for MoH and its agencies to collaborate in quality healthcare monitoring after accreditation and credentialing using common tools that encompass perceived and technical quality indicators. Currently, the GHS, NHIA and Health Facilities Regulatory Agency (HEFRA) engage in separate quality monitoring activities using different tools that are apparently not harmonized. Although these agencies have different mandates, effective collaboration and harmonization of similar tools will help promote efficiency, reduce duplications, monitoring cost and waste of limited resources. Comprehensive quality healthcare assessment using harmonized tools will most likely identify quality healthcare gaps better and enhance clients’ experiences of service quality needed to increase service utilization and ultimately improve health outcomes.

Efficiency in health service delivery is an important component of healthcare quality besides the principles of client-centred care, healthcare safety, effectiveness, timeliness and equity [12,72,73]. According to the WHO [12], health systems must be efficient to ensure sustainable healthcare. The WHO estimates that global waste of 20-40% is recorded in the health sector due to inefficiencies [12]. In Ghana, the NHIA is reported to have experienced an escalated reimbursement cost from US$ 6 million in 2005 to over US$ 300 million in 2012 partly due to inefficiencies in accredited health facilities [74]. According to the NHIA, significant cost savings could be made if accredited healthcare providers operate more efficiently with available resources. Limited health resources worsened by diminishing international donor support and lowering government budget allocation to the health sector necessitate renewed commitment to efficient utilization of available resources, particularly in developing countries which bear the brunt of these resource constraints [1,10,26,27].

In our baseline studies, we found that nearly 70% of facilities (mostly urban-based) were inefficient, as per set definitions. These findings are consistent with results from similar studies in Ghana [75-78], Eritrea [79] Benin [80], South Africa [81] and Zambia [82] where high levels of inefficiencies were recorded in surveyed health facilities. This phenomenon appears to mirror the bigger problem of health systems in Africa where urban areas are over-resourced to the detriment of rural areas with higher disease burdens and limited health resources [1,10,26,27].

Health systems in Africa need to adopt health technologies in m-Health and e-Health solutions as part of measures to control waste of health resources, reduce human errors and duplication of efforts. Incorporation of these new health technologies into existing policy documents will help reduce inefficiencies in health systems in Africa without compromising service quality. Furthermore, strict adherence to staffing norms, need analysis, resource allocation and distribution protocols will help control inequities in health resources distribution.
Findings in this thesis have contributed to ongoing policy debates in Ghana on interventions to improve health service quality and NHIS sustainability. Findings were presented in series of stakeholder meetings including the NHIA and GHS senior managers’ meetings. Moreover, engagements with a WOTRO funded project (Knowledge Translation Network (KT-Net) for Africa based in Uganda) have helped disseminate some findings from this thesis through blogs and policy briefs on local and international platforms [83-85]. Print and electronic media involvement in the dissemination of study findings also underscore contributions of our research findings to health policy in Ghana and beyond [86-88].

Recommendations from our studies are believed to have contributed to implementation of vital interventions by the NHIA like instant membership cards production and distribution, biometric registration, establishment of client call centre and electronic claims processing [74,89]. Our research findings are also believed to have contributed to ongoing debates on possible reforms for the NHIS, including request by the president of Ghana for a review of the NHIS. The report was submitted in 2016 to inform policy reforms on the insurance scheme.

All in all, our policy recommendations are expected to stimulate policy dialogues and civil society discussions on possible health reforms on health worker motivation, staffing norms, and client-centred quality services at the levels of health insurance offices and healthcare facilities. This approach is expected to increase clients’ trust in Ghana’s healthcare system and induce active client-centred quality services at the levels of health insurance offices and healthcare facilities. The impact of health insurance in Africa: a systematic review. Bulletin of the World Health Organisation 2012:90:685-692.

In conclusion, we demonstrated in this thesis the feasibility of proposed policy recommendations but the ultimate decision to adopt these recommendations rests on health policy makers and the political will for innovation and change. Cognizant of the tight fiscal space being competed for by various sectors of the economy in Ghana, there is need for due diligence in priority setting, innovative resource mobilization, fiscal discipline, political will and commitment to public health interventions. It is assumed that more policy discourses and stakeholder engagements on the various recommendations will help attain UHC in Ghana and meet the National Health Policy [90] goal of creating wealth and economic growth through a healthy population.

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Chapter 8


Addendum

Summary

Nederlandse Samenvatting

Authors and Affiliations

Acknowledgements

List of Publications

PhD Portfolio

Curriculum Vitae
SUMMARY

Ghana has made significant progress as measured by a number of health outcome indicators following introduction of the national health insurance scheme (NHIS) in 2003. Notwithstanding the successes chalked, active participation and retention in the scheme remains a challenge. Today (2016) about 60% of the estimated 26.9 million Ghanaians still pay out-of-pocket to access basic healthcare services. Moreover, increasing concerns of poor quality healthcare in NHIS-accredited health facilities and delayed reimbursements appear to dwindle subscribers' and health providers' trust in the NHIS.

As part of the introductory chapter of this thesis (Chapter 1), current challenges confronting the NHIS in Ghana were briefly discussed. These challenges include reimbursement cost escalation, political interference, poor quality healthcare and administrative services delivered, inadequate technical capacity of National Health Insurance Authority (NHIA) staff responsible for NHIS implementation, and uneven geographic distribution of health facilities and health workers. Other challenges are poor monitoring and supervision by NHIA, delayed provider reimbursement, too broad NHIS benefits package with no co-payments, too large exemption groups, inadequate client education on NHIS benefits package offerings, and limited client/community engagement in NHIS activities.

Moving forward, NHIA should improve monitoring and supervision activities; ensure timely release of funds for provider reimbursement; review its exemption policy and benefits packages; build capacity in NHIS claims processing and vetting, and improve credentialing processes. Furthermore, Chapter 1 presents a brief description of the design and implementation of the “systematic community engagement (SCE)” interventions that are core to this thesis. The SCE interventions were particularly designed to promote a more client-centred healthcare and health insurance service. Overall, 52 community groups and associations were engaged to assess quality healthcare services in 32 intervention facilities and outcomes were compared with 32 controls. Outcomes of the SCE interventions and impact evaluation are presented in Part Two of this thesis.

Part One of this thesis comprises baseline quantitative studies reported in chapters 2, 3 and 4, representing pre-intervention findings. In Chapter 2 we explored among 324 frontline health staff factors that motivate or constrain them to deliver quality healthcare services to patients. Associations between staff motivation and their quality improvement efforts were examined. Nearly 60% of the 324 respondents worked in rural and private facilities; mean age of interviewed staff was 39 years and approximately 80% were clinical staff. Motivation levels appeared generally low among staff working in public health facilities even though these staff received relatively higher monthly salaries than those employed in private facilities. While private sector health professionals were demotivated by limited opportunities for career development, public sector health workers were dissatisfied with physical work environment and inadequate medical logistics. A significant positive correlation was found between staff motivation levels and quality healthcare scores in health facilities. We conclude that tailor-made motivation packages targeting specific needs of healthcare workers be integrated into mainstream quality improvement strategies in Ghana, especially in public health facilities where motivation levels and quality improvement efforts appeared lowest.
In Chapter 3 we examined the differences in perceptions of clients and professional staff on healthcare quality. It was found that the 324 interviewed healthcare workers perceived many quality healthcare indicators satisfactory contrary to the 1,903 sampled clients who expressed their disappointment. Staff-client perception gaps were particularly wide in the areas of satisfaction with health service provision, compassion and supportiveness of staff, respectfulness of staff and waiting times at health facilities. We also established that clients’ perception of health care quality had no positive association with medical technical measures of quality healthcare. Our findings suggest that increased efforts towards medical technical quality improvement alone will not necessarily translate into enhanced experiences of clients with service quality and subsequent willingness to utilize health services in NHIS-accredited health facilities. There is a clear need to intensify client education, incorporate client feedback and thus balance the commitment towards both technical and client-perceived quality healthcare by health managers. It is postulated that such intervention would help instill client confidence in NHIS and further stimulate their participation in NHIS.

Efficiency in healthcare delivery remains critical for sustainable health insurance in resource limited countries such as Ghana. In Chapter 4 we used the Data Envelopment Analysis Programme, version 2.1 to estimate the technical efficiency of 64 NHIS-accredited health facilities. Technical efficiency is defined as the weighted sum of available human and material resources of a health facility divided by the weighted sum of service outputs. In addition, Tobit regression was performed to predict factors associated with efficiency levels. Twenty (20) out of 64 facilities (31%) were significantly more efficient than their peers. Rural facilities were generally found to be more efficient. No significant association was found between technical efficiency scores and quality healthcare indicators in participating health facilities. It is concluded that resource wastage is common in Ghanaian health facilities, particularly those located in urban regions. It is therefore recommended to perform thorough need analysis by health regulatory authorities prior to resource distribution. Moreover, sustained continuous professional development (CPD) trainings on efficient utilization of available health resources could help promote efficiency without compromising quality healthcare standards.

Part Two comprising chapters 5, 6 and 7 evaluated impact of the SCE interventions after nearly 12 months of implementation. In Chapter 5, we investigated effects of the SCE interventions on patient safety and risk reduction efforts in 64 primary health facilities. This study was a randomized control trial in the Greater Accra and Western regions. We found that clinic staff efforts toward increasing patient safety and reducing risk significantly improved in intervention facilities, particularly with respect to leadership, accountability and demonstrated staff competencies. We conclude that engagement of communities in health service planning and implementation could support increased facility efforts with respect to quality and patient safety.

Chapter 6 evaluated impact of the SCE interventions on health worker motivation and personal experiences with clients. Even though the wage bill for public sector health workers constitutes about 90% of domestic government expenditure on health in Ghana, health worker motivation levels and performance output remain low. In Chapter 6 we conducted a randomized cluster trial involving clinical and non-clinical frontline health workers in 38 private and 26 public health facilities. Total of 234 staff were interviewed during baseline and follow-up after SCE. We found that non-financial work incentives including cordiality with clients and perceived career prospects were key sources of motivation for healthcare staff. Although financial incentives were also perceived as important sources of motivation, these were generally rated lower. We conclude that community-based feedback can boost healthcare staff motivation in Ghana.

Finally, in chapter 7 we evaluated impact of the SCE interventions on health workers’ perspectives on the NHIS and effect on quality health service delivery. The randomized cluster trial covered 234 frontline health workers before and after the SCE interventions. We found that over 70% of respondents expressed dissatisfaction with delayed reimbursement of health service providers by the NHIA. The SCE interventions did significantly improve staff perceptions on the NHIS with respect to drugs availability for NHIS subscribers and workload on health staff. We conclude that client engagement by the NHIA and health policy makers can prove beneficial in promoting active participation and create goodwill for the scheme by healthcare providers.

In conclusion, Ghana like many sub-Saharan African countries is confronted with critical public health challenges partly due to limited access to quality basic healthcare services coupled with insufficient health sector budgets and incomplete insurance options. Diminishing donor support by developed countries demand that African countries adopt indigenous sustainable interventions to address health system challenges and improve the well-being of its populations. Findings in this thesis have established that effective client engagement through SCE is a promising and affordable strategy to enhance (perception of) performance of healthcare facilities and also improve relations with NHIS. These findings are expected to stimulate policy dialogues on further healthcare quality improvement and sustainable health financing in Ghana.
Met de invoering van de nationale ziektekostenverzekering (NHIS) in Ghana in 2003 heeft het land aanzienlijke vooruitgang geboekt, zoals blijkt uit de meting van een aantal indicatoren van zorguitkomsten. Ondanks dit succes, blijft het werven en vasthouden van verzekeringsklanten een uitdaging. Ongeveer 60% van de naar schatting 26,9 miljoen Ghanezen betaalt nog steeds 'out-of-pocket' voor toegang tot basis zorgvoorzieningen. Daarnaast bestaat er een toenemende bezorgdheid ten aanzien van de slechte kwaliteit van zorg die NHIS-geaccrediteerde klinieken leveren, als wel in de trage declaratievergoeding aan de zorgaanbieders. Dit heeft onder zorgaanbieders en zorgklanten geleid tot een dalend vertrouwen in de NHIS.

In het inleidende hoofdstuk van dit proefschrift (Hoofdstuk 1) worden in het kort de huidige uitdagingen van de NHIS in Ghana beschreven. Deze betreffen onder andere de escalerende kosten van vergoedingen, politieke invloeden, matige kwaliteit van de geleverde zorg en administratieve services, beperkte technische capaciteit van de National Health Insurance Authority (NHIA) verantwoordelijk voor de implementatie van de NHIS en ongelijke geografische verdeling van medische zorgvoorzieningen en zorgpersoneel. Andere uitdagingen zijn ondermaatse controle en toezicht door de NHIA, vertraging van vergoedingen aan zorgverleners, te ruime samenstelling van het NHIS pakket zonder eigen bijdrage, het grote aantal groepen dat vrijgesteld is van premiebetaling, onvoldoende informatievoorziening en educatie aan zorgklanten en de beperkte betrokkenheid van de gemeenschap in NHIS activiteiten. Naar de toekomst zou NHIA de monitoring en toezicht activiteiten moeten verbeteren en de capaciteit van zijn administratieve processen verder opbouwen. Ook zou de NHIA moeten zorgen voor het tijdig vrijmaken van middelen voor vergoeding van de geleverde zorg en het beleid voor vrijstelling van premiebetaling en van de inhoud van het verzekeringspakket herzien. Verder beschrijft Hoofdstuk 1 het ontwerp en de implementatie van de “systematic community engagement” interventie (SCE), die centraal staat in dit proefschrift. De SCE interventies werden speciaal ontworpen om de gezondheidszorg erdoor verbeteren en te stimuleren, en om te zorgen dat de interventies effectief worden uitgevoerd. In totaal deden 52 gemeenschapsgroepen mee om de kwaliteit van zorg te beoordelen in 32 klinieken. De bevindingen werden vergeleken met 32 klinieken in de controle groep. Uitkomsten van de SCE interventies en effectbeoordeling worden gepresenteerd in het tweede deel van dit proefschrift.

In het eerste deel van dit proefschrift (Hoofdstukken 2, 3 en 4) worden de kwantitatieve resultaten van de nul-metingen voorafgaand aan de SCE interventies gepresenteerd. In Hoofdstuk 2 verkennen we factoren die faciliterend of beperkend werken op de motivatie van 324 eerstelijns gezondheids werkers om goede kwaliteit zorg te bieden aan patienten. De relatie tussen motivatie van medisch personeel en hun inspanningen om zorgkwaliteit te verbeteren werd onderzocht. Bijna 60% van de 324 respondenten werkten op het platteland, de gemiddelde leeftijd van de ondervraagden was 39 jaar en ongeveer 80% van de respondenten bestond uit klinisch personeel. Motivatie was over het algemeen laag onder overheids personeel, ook al waren maandsalarissen relatief hoger dan salarissen voor zorgverleners in de particulier sector. Particuliere zorgverleners bleken gedemotiveerd door beperkte mogelijkheden voor
In Hoofdstuk 2 onderzochten we verschillen tussen klanten en medisch personeel in hun perceptie van de kwaliteit van zorg. Het bleek dat de 324 ondervraagde gezondheidswerkers vele zorgkwaliteitsindicatoren als bekrachtigd ervoeren, in tegenstelling tot de 1,903 geïnterviewde cliënten die juist op deze punten hun teekuirestelling uitten. Verschillen in perceptie van zorgpersoneel versus zorgcliënt waren vooral groot op het gebied van tevredenheid rond dienstverlening, medeleven en ondersteuning door het zorgpersoneel, respect getoond door het zorgpersoneel en de wachtperioden bij de klinieken. We stelden ook vast dat perceptie van kwaliteit van zorg door klanten geen positieve associatie had met medisch-technische maatregelen rond kwaliteit. Onze bevindingen suggereren dat verhoogde inspanningen rond medische-technische kwaliteitsverbetering van de zorg, zich niet noodzakelijkerwijs vertalen in betere kwaliteitservaringen van klanten en vervolgens hun bereidheid om zorg af te nemen in NHIS-geaccrediteerde klinieken. Het is noodzakelijk dat zorgmanagers klantvoorzichtigheid intensiveren, terugkoppeling van klanten incorporeren en aldus een balans vinden tussen (het belang van het) gerandomiseerd cluster trial uit waaraan klinisch en niet-klinisch personeel van 38 private en 26 openbare klinieken mee deel. In totaal werden 234 medewerkers geïnterviewd voorafgaand en na de SCE interventie. We vonden dat niet-financiële prikkels, zoals interactie met klanten en perceptie van carrièremogelijkheden, de belangrijkste bron van motivatie was voor het personeel. Hoewel financiële prikkels ook van belang zijn, werden die toch over het algemeen als minder belangrijk ervaren. We concluderen dat terugkoppeling uit de gemeenschap de motivatie van medisch personeel in Ghana kan bevorderen.

Tenslotte evalueren we in Hoofdstuk 7 de impact van de SCE interventies op de perspectieven van gezondheidszorgpersoneel op de NHIS en het effect op de kwaliteit van de zorg. De gerandomiseerde cluster studie betrof 234 frontlinie zorgverleners voor en na de SCE interventies. We vonden dat meer dan 70% van de respondenten ontevreden waren met vertraagde betaling door de NHIA. De SCE interventies verbeterden significante perceptie van medisch personeel op de NHIS wat betreft beschikbaarheid van medicijnen voor NHIS klanten en de werkdruk op het personeel. We concluderen dat betrekking van klanten door NHIA en zorgbeleidsmakers nuttig is ter stimulering van actieve verzekeringsdeelname en het creeren van ‘goodwill’ voor de verzekering bij klinieken.

Ghana wordt, net als veel sub-Sahara Afrikaanse landen, geconfronteerd met enorme uitdagingen op het gebied van volksgezondheid, mede vanwege de beperkte toegang tot kwaliteitszorg, in combinatie met onvoldoende budgetten en incomplete verzekeringsopties. Afnemende ondersteuning door donorlen de rijkere landen vereist dat Afrikaanse landen hun persoonlijke ervaringen met klanten. Hoewel de loonkosten voor de publieke zorgwerknemers ongeveer 90% van de binnenlandse overheidsuitgaven voor gezondheidszorg in Ghana betreffen, blijft de motivatie en prestatie van werknemers onder de maat. De SCE interventies werden als effectief en nuttig ervaren. We vonden dat niet-financiële prikkels, zoals interactie met klanten en perceptie van carrièremogelijkheden, de belangrijkste bron van motivatie was voor het personeel. Hoewel financiële prikkels ook van belang zijn, werden die toch over het algemeen als minder belangrijk ervaren. We concluderen dat terugkoppeling uit de gemeenschap de motivatie van medisch personeel in Ghana kan bevorderen.
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My wife and children (Awedobah Robert Jnr. and Awelana Jessica) have supported me towards the successful completion of my PhD work. Without your cooperation, sacrifices and moral support I would not have had the sound mind needed to complete this programme successfully. I sincerely appreciate your incessant prayers and moral support all these years. May the good Lord bless you and grant us all good health and long life. I am very proud of you all and words cannot express my joy, happiness and appreciation to you.

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Last but not the least, I wish to express my appreciation to peer reviewers of international journals who made constructive criticisms towards improving the quality my published papers. I specifically wish to thank the editorial teams and reviewers of the following journals for publishing my papers: PLoS ONE, BMC Human Resources for Health, BMC Cost effectiveness and Resource Allocation, and BMC Health Services Research. I am forever grateful to you for your contributions to disseminating findings of our project to the international community.
LIST OF PUBLICATIONS


PhD Portfolio

Name of PhD Student: Robert Kaba Alhassan

PhD Period: 2012-2016

PhD Supervisors: Prof. Tobias F. Rinke de Wit, Dr Nicole Spieker

Courses

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Oral presentation at National Health Insurance Authority (NHIA) 10th Anniversary International Conference at Accra, Ghana 2014 0.9
E-poster presentation at Health Systems Global (HSG) International Conference at Vancouver, Canada 2016 1.0

Teaching
Lecturing: Research methods & Surgical Nursing, Ministry of Health Training College, Lawra Upper West Region of Ghana 2013 1.2
Lecturing: Principles of management in nursing, Ministry of Health Training College, Navrongo Upper East Region of Ghana 2014 1.9

Mentoring
David Sennie, Graduate Nurse University of Ghana, Legon 2012, 2014 1.5

Parameters of Esteem
IUSSP and Korean National Organizing Committee, of International Population Conference (IPC), 2013 grant US$ 2,733.00 2011

CURRICULUM VITAE

Robert Kaba Alhassan is a native of Chiana-Nyangania in the Kasena-Nankana West district of Upper East region, Ghana. He was born in 1982 in a border town called Paga also in the Upper East Region where he pursued his basic education. He later attained his Senior Secondary School Certificate Examinations (SSSCE) in 2011 from the Navrongo Senior High School, in Upper East Region. After his secondary education he gained admission into the premier University of Ghana, Legon where he graduated with a Bachelor’s degree in Nursing and Psychology (First class honours) in 2006 and later graduated with an M.Phil in Health Services Administration from the same university.

Between 2007 and 2008 he worked in Korle-Bu Teaching Hospital as an intern in various departments including Reconstructive and Plastic Surgery and Cardiothoracic units. He also worked in a number of private hospitals during this time on part time basis. In 2009, he was employed full time by the Ghana Health Service as a nursing officer in the Ga West Municipal hospital, Greater Accra Region until 2012. While in the clinical setting in Ga West Municipal Hospital, he gained a wealth of experience in surgery and surgical nursing, accidents and emergency nursing and management of Buruli Ulcer patients.

Besides the clinical experience, Robert taught in a number of private and public health training institutions in the capital Accra and some rural areas in northern Ghana to the extent that he wrote a Surgery and Surgical Nursing book to suite tropical nursing practice. Over 1,000 copies of this book have been sold throughout the country, contributing to quality pre-service training of health professionals in the country.

Robert also worked with a USAID implementing agent in Ghana called USAID|DELIVER as a programme officer for monitoring and evaluation in medical logistics and supply chain management. He worked there between 2010 and 2011 before starting his PhD training with the Amsterdam Institute for Global Health and Development (AIGHD), University of Amsterdam (Faculty of Medicine).

The author’s career objective is to establish himself in the field of academia and research especially in the areas of healthcare quality and health systems strengthening particularly in resource poor countries.

He aims at working with local and international institutions focused on these subject areas or related fields. Specific topic areas of interest are global health and development, health financing, patient safety/risk reduction, workplace safety and implementation research. Robert currently lives in Accra, Ghana with his wife and two children (Robert Jnr and Jessica).