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Universal Coverage in Developing Countries: A Summative Evaluation of Maternal Policies in Ghana and Burkina Faso

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UNIVERSAL COVERAGE IN DEVELOPING COUNTRIES: A SUMMATIVE EVALUATION OF MATERNAL POLICIES IN GHANA AND BURKINA FASO

by

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(Under the Direction of Bettye Apenteng)

ABSTRACT

The Word Health Organization (WHO) has declared health to be a fundamental human right, yet more than 400 million people around the world do not have access to essential health services. Millions of Africans are unable to access or afford needed services without sustaining economic hardship. Sub-Saharan Africa is behind the rest of the world on coverage of essential health services such as planning, immunization, and sanitation and continues to grapple with higher rates of child mortality, maternal death, and communicable diseases. Despite bearing 25 percent of the world's disease burden, the region only retains 3 percent of its doctors.

Universal health coverage (UHC) has gained attention in recent years as a viable means of ensuring access to care for all, including the most vulnerable and those residing in developing parts of the world. The underlying assumption is that by assuring basic health care coverage for all, UHC can minimize impoverishment resulting from catastrophic health expenditures. Many low-income countries have taken the lead in implementing universal health coverage reforms, among them Ghana and Burkina Faso – a Sub-Saharan country.

Ghana passed the National Health Insurance Scheme (NHIS) in 2003 with the aim of moving towards universal health care coverage and improving the quality of health of its population. Ghana's NHIS is a tax-funded national health insurance system that provides financial

protection and expands health care coverage to the citizenry (Health Systems 20/20 Project and Research & Development Division of the Ghana Health Service, 2009). In 2008, this law was amended to include a maternal free care policy that extended care services to all pregnant women and their newborns free of charge. On the other side, Burkina Faso adopted a policy in 2006 that subsidized deliveries and emergency obstetric care. The subsidy for deliveries and emergency obstetric and neonatal care (EmONC) funds 80% of deliveries and caesarean sections, and the patient pays the remainder 20%. The policy entirely exempts those categorized as "the poorest." Contrary to Ghana, the country did not receive all the support required in formulating the plan, and those in charge had to learn through trial and error. This study will evaluate the effectiveness of each program separately at increasing the utilization of maternal health services and at improving child health outcomes. The outcomes evaluated include antenatal, perinatal, and postnatal health care utilization and neonatal and infant mortality.

INDEX WORDS: Universal Coverage, Free Health Care, Insurance, Developing Countries, Maternal and Child Health, Neonatal and Infant Mortality, Health Service Utilization, Policy evaluation.

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DEDICATION

In loving memory of my mom Elisabeth Sawadogo, I wouldn't be here without your devotion and encouragements. You were always my cheerleader picking me up every time I fell. This work may have my name, but it is a testament to what you instilled in me. Je t'aime maman.

Dad, you are my rock, and you always believed in me. I am forever grateful for all the sacrifices you made so that I could achieve my dream. Merci du fond du Coeur.

To my sibling, Salamata, Djemiratou, and Aziz thank you for constantly believing in me and pushing me to finish when at times I wanted to give up. We made it!

"The LORD is my strength and my shield; my heart trusts in him, and he helps me. My heart leaps for joy, and with my song I praise him." Psalm 28:7

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DEFINITIONS OF TERMS

Universal Coverage - "access to comprehensive health services at affordable cost and without financial hardship through protection against catastrophic health expenditures" (WHO, 2014)

Mortality rate - A measure of the frequency of occurrence of death in a defined population during a specified interval of time (CDC, 2013).

Neonatal mortality rate – "A ratio expressing the number of deaths among children from birth up to but not including 28 days of age divided by the number of live births reported during the same period. The neonatal mortality rate is usually expressed per 1,000 live births" (CDC, 2013).

Developing countries - Countries with a Gross National Income (GNI) of US$ 11,905 and less (World Bank, 2013).

Neonatal mortality – whether infant died within the 1st month of life.

Infant mortality – whether baby died before the 1st birthday.

Post-neonatal mortality – the difference between a child and neonatal mortality.

Under-five mortality – whether the child died before the fifth anniversary.

Child mortality – whether the child died between the 1st and fifth birthdays.

Women's status - a women's overall position in the society, which encompasses an educational, cultural, economic, legal, and political situation in each society (Shimamoto, & Gipson, 2015).

Women's empowerment - the process by which those who have been denied the ability to make strategic life choices acquire such knowledge, comprising three inter-related dimensions – resources, agency, and achievements (Shimamoto, & Gipson, 2015).

Maternal death - the death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental cause (WHO, 2013).

CHAPTER 1: INTRODUCTION

Introduction

According to the World Health Organization (WHO), universal health coverage (UHC) is "the single most powerful concept that public health has to offer" (WHO, 2012). This assertion explains the push toward universal health coverage in the past decade and highlights the WHO's commitment to helping developing countries attain this goal, through the establishment of national insurance schemes (Garabedien et al., 2012). UHC focuses on "ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the utilization of these services does not expose the user to financial hardship" (WHO, 2010).

UHC can have a direct impact on a population's health; it is a critical component of sustainable development and poverty reduction, and an essential element of any effort to reduce social inequities (WHO, 2013). Experts believe that, globally, the restructuring of care delivery and financing systems is required to increase access to health care services, reduce financial hardship caused by out-of-pocket health expenditures, and improve the efficiency and equity of health systems (Kutzin, 2013). The strengthening of health financing system and sustainable investments in social health insurance have been identified as sustainable solutions to the health care crisis in many developing countries including Sub-Saharan African countries (World Bank, 2015; Ravishankar et al., 2009).

Sub-Saharan African countries continue to struggle with issues of child mortality, maternal death, malaria, and other communicable and or treatable diseases (Aikins & Okang, 2006). Many low-income countries, such as Ghana and Burkina Faso have taken steps in

implementing policies that will increase access and the utilization of health care services for the mother and child. The Ghanaian government, with support from external organizations, passed the Ghana National Health Insurance System (NHIS) reform in 2003, modeled after existing and successful Community-Based Mutual Health Insurance Schemes in the country (Ghana Ministry of Health, 2014). Burkina Faso committed to improving access to emergency obstetric and neonatal care. The country funded, in the national budget, a policy of subsidizing direct costs between 2006 and 2015, known as the national subsidy for deliveries and emergency obstetric and neonatal care (EmONC) (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011).

Background of the Problem

Ghana Health Insurance Scheme

Ghana passed NHIS on September 2003 and implemented the policy in 2005. By 2008, over half of the country had voluntarily enrolled into the scheme (Rajkotia, 2009). One key objective of the NHIS was to propel the country toward achieving the Millennium Development Goals (MDGs) 4 and 5 by 2015. Unfortunately, like many other nations, and despite significant progress, Ghana did not reach the MDG-4 goal of 2/3 reduction in under-five years mortality and the MDG-5 goal of 3/4 reduction in maternal mortality by the end of 2015 (Mullick & Serle, 2011).

In 2013, the National Health Insurance Authority (NHIA) report shown that only about 10.3 million people had enrolled in the NHIS, approximately 38% of the population as opposed to the 2008 report recalling over 50% enrollees (National Health Insurance Authority, 2013). This decrease in enrollment is explained by a change in the methodology of how active members

are calculated (Blanchet, Fink, & Osei-Akoto, 2012). Of those, 66% are from the exempt categories including women and children (NHIA, 2013; Dixon, Tenkorang, & Luginaah, 2013).

Similarly, Burkina Faso took steps to address its poor maternal and neonatal health indicators by launching a national subsidy scheme for delivery and emergency obstetric and neonatal care - EmONC. The aim was to accelerate progress towards MDG Four and Five respectively by reducing user fees for maternity services. The policy, which passed in 2006, covered 80% of all emergency obstetric care. Burkina Faso did not meet the millennium goals like many other low-and-middle-income countries in Sub-Saharan Africa.

To date, few studies have attempted to evaluate the effectiveness of these programs at improving targeted health outcomes. Additional studies are needed to determine how coverage under the NHIS and the EmONC has impacted the utilization of maternal services and the associated health outcomes. This chapter begins by providing a historical overview of the development of health insurance in both Ghana and Burkina Faso, an overview of the NHIS free maternal policy and the EmONC 80% subsidy, and a review of the current status of maternal and child health. Next, this chapter outlines the objectives of this dissertation and describes the general approach to meeting these goals.

Historical Context of Ghana's Health Care System

Ghana gained its independence from Britain in 1957. Following independence, Ghana implemented a system of free primary care service in public facilities. Tax revenue and external donor support helped sustain the plan (Chankova, Atim, & Hatt, 2010). The system had the advantage of catering to the poor but was financially unsustainable (Blanchet, 2012). Through the years, the country experienced a decline in the quality of care due to shortfalls in revenue and

increasing demand for health care services (Agyepong & Adjei, 2007; Mante, 2011). In 1969, the government reintroduced fees for service to curb these problems by enacting the Hospital Fees Decree, amended in 1971 as the Hospital Fees Act (Waddington & Enyimayew, 1990). A small fee for services was imposed to reduce excess demand, or 'frivolous' demand (Waddington & Enyimayew, 1990).

By the 1980s, the scarcity of financial resources, debts, and external pressures led to the implementation of the structural adjustment programs (SAPs) (Waddington & Enyimayew, 1990). Established and promoted by the World Bank, the International Monetary Fund, and Western donors, these programs emphasized macroeconomic steadiness, privatization and open market development (Heidhues, & Obare, 2011). SAPs were developed to address the African countries economic crisis of the 1970s. Most developing countries like Ghana forcefully adopted the SAPs conditions to ensure receipt of financial assistance from the World Bank. Under SAPs, Ghana raised user fees for both health and education significantly and cut public spending. This cost recovery program led to higher interest rate, liberalization of foreign exchange rules and trade (deregulation), rationalization and privatization of public and parastatal companies, and deregulation of the economy (Zabadi, 1992; Heidhues, & Obare, 2011).

Consequently, health care service fees were increased to raise money. The new system, commonly referred to by Ghanaians as "cash-and-carry," required significant out of pocket payments at the point of service for most health care services. These services included "consultations, laboratory and other diagnostic procedures, medical, surgical and dental services, medical examinations and hospital accommodation" (Nyonator & Kutzin, 1999). By implementing the cash-and- carry system, the government aimed to generate additional revenues to cover ¼ of recurrent costs faced by the health care sector (Wadddington & Enyimayew, 1990;

Mwabu, 2008; Mante, 2011). Unfortunately, the cash-and-carry system proved to be unsuccessful at rebooting the Ghana health system. Instead, the system further deepened the gap in access to health care for the poor (Blanchet et al., 2012; Adjei, 2008; Kutzin, 1999).

By 1990, all government subsidies on health care delivery ceased, and Ghanaians paid the full cost of medication and medical services (Nyonator & Kutzin 1999; Rajkotia, 2009). By 1995, over half of the total health care expenditures were in the form of out of pocket payments, deepening the unresolved issue of access to care, especially for the most vulnerable population (Jehu-Appiah, 2012). This system made access to health care services impossible for the poor, and many deferred the need to seek care (Rakotia, 2009). The cash-and-carry system led to unhealthy practices such self-medication, use of illegally-purchased pharmaceuticals, consultation with traditional doctors, and ultimately to the decline of Ghana's healthcare system and health outcome indicator (Waddington, & Enyimayew, 1989; Waddington, & Enyimayew, 1990). Utilization rates dropped by more than half nationally, and by up to 75% in rural areas (Waddington, & Enyimayew, 1989; Waddington, & Enyimayew, 1990).

In order to reverse the damage caused by the cash and carry system, Ghana established the Community-Based Health Insurance Schemes (CBHIS) were but only a proportion of the population (about 2 percent) were covered (Jehu-Appiah et al., 2011; Dalinjong & Laar, 2012). Building on the experience gain through the establishment of the CBHIS, the government passed the National Health Insurance Bill in 2003 to improve accessibility and expand coverage to all Ghanaians (McIntyre et al., 2005). The law, enacted in 2003, was entitled "the National Health Insurance Act" and was fully implemented in 2005. The NHIS mission is to provide an equal and universal coverage of quality care, for all Ghanaians at an affordable price (Ghana Ministry of

Health, 2014). The NHIS is viewed as the "most ambitious" and "boldest steps towards universal coverage in sub-Saharan Africa" (Atim, 2011; McIntyre et al., 2008).

The National Health Insurance Scheme Framework

The National Health Insurance Act of September 2003 established Ghana's first national health insurance reform – the NHIS. The Act put in place a National Health Insurance Authority (NHIA) and a governing council in charge of monitoring the development and operations of the NHIS, accrediting providers. NHIA also managed the National Health Insurance Fund (NHIF) by collecting revenue, investment, disbursement, and administration of the Scheme (Barimah & Mensah, 2013). In 2004, a legislative instrument (LI 1809) was passed to oversee the implementation, which began in 2005 and to regulate the NHIS program.

The Act established three health insurance schemes: District Mutual Health Insurance Scheme (DMHIS), Private Mutual Health Insurance Scheme (PMHIS), and Private Commercial Health Insurance Scheme (PCHIS), and linked them through the NHIF. Enrollment is mandatory for all residents. The NHIS' primary objective as stated in the policy framework is to:

> …assure equitable and universal access for all residents of Ghana to an acceptable quality package of essential healthcare… every citizen of Ghana shall belong to a health insurance scheme that adequately covers him or her against the need to pay out of pocket at the point of service use to obtain access. ("Ghana Ministry of Health" [MOH], 2012 & 2004 p7).

The policy aimed at assuring that all residents of Ghana belonged to a health insurance scheme that adequately covered them against the need to pay out of pocket at the point of service and assured them access to a defined package of acceptable quality of health service (MOH,

2004). The underlying objectives of the policy are to ensure equity, risk equalization, cross-subsidization, quality of care, solidarity, efficiency, community or subscriber ownership, partnership, reinsurance, and sustainability (MOH, 2004). The Act set out an intention to achieve universal health insurance coverage within five years (Health Systems 20/20, 2009).

Main Categories of Health Insurance Scheme in Ghana

The NHIS combined traditional Social Health Insurance Schemes in the formal sector to existing Mutual Health Organizations in the informal sector to create the District Mutual Health Insurance Schemes (DMHIS). In addition to the DMHIS, the NHIA endorsed two additional health insurance schemes: the Private Mutual Health Insurance Scheme (PMHIS), and the Private Commercial Health Insurance Scheme (PCHIS) (Adu-Gyamfi, Brenya, & Amoah, 2015). These existing schemes are the backbone of the Ghana's NHIS framework.

DMHIS are district-based plans, set as a public or a non-commercial scheme and open to all Ghanaians. DMHIS are partially financed through premiums, and subsidized by the government through NHIF. DMHIS operates in all 170 districts of the country. Only one DMHIS is allowed per district with a minimum of 2000 members (Dietrich-O'Connor, 2010).

PMHIS are established by individuals, organizations, or religious groups with the aim of sharing the health risk pool. PMHIS are community-based and can only cover services approved by the governing council of the scheme (NHIS, 2015). Subscribers' premiums financed the PMHIS, an unsubsidized plan opened to all individuals. PMHIS function as limited liability companies disconnected from the NHIS.

National Health Insurance Scheme financing

Various sources finance Ghana's NHIS including 1) a 2.5 percent VAT tax on goods and services; 2) the payroll deductions of 2.5 percent of the 17 percent social security contribution of formal sector employees (SSNIT), including government institutions, the private and industrial sectors; premiums contribution from the informal sector (Yankah, 2009); 3) investments income; 4) money allocated to the fund by Parliament as sector budget support; 5) and grants, donations, gifts, and other voluntary contributions (Amporfu, 2013; Apoya, & Marriott, 2011).

The health insurance levy and the SSNIT are the primary sources of inflows, contributing at 67% and 15.6% respectively. Insurance premiums only have a limited contribution to the NHIS total revenue (5%) but are a key indicator of assessing achievement of universal coverage. Investment income makes up 17% of total inflow, with sector budget support and other sources making up 2.3% and 0.2%, respectively (Amporfu, 2013).

Exemptions Categories

To meet the goal of providing affordable and comprehensive care to all Ghanaian, the NHIS granted a fee waiver to the elderly, pensioners, and indigents (core poor) (MOH, 2014). As of 2008, pregnant women were also exempted from premium payment under the free maternal care policy (Mensah et al., 2010; Brugiavini & Pace, 2010). However, those exempted from premiums still had to be registered to receive the benefits. There is a six-month waiting period between joining and being eligible for benefits (Government of Ghana, 2003). The waiting period is waived for pregnant women under the free maternal care policy provision (Mensah et al., 2010). The following groups of individuals are exempted from premium payment:

- All people under 18 years with parents enrolled into the scheme.

- Individuals classified as indigents (impoverished), based on a means test, up to 0.5% of the total membership of any scheme.
- People aged 70 years and above.
- Seniors under the Social Security Pension Scheme.
- Pregnant women (since 2008).

The NHIF pays a flat rate of approximately GH¢ 14 or US$ 3.29 (conversion rate of GH¢ 4.26 per US$ 1) per exempt member to the scheme to which they belong (Apoya, & Marriott, 2011).

Coverage, Premiums, and Benefits

Enrollment into the NHIS is mandatory for everyone in the formal sector, while informal sector workers are required to pay a premium to enroll. Formal sector employees contribute to premiums via payroll deduction collected (2.5% deduction). Depending on their income, those in the informal sector as well as the self-employed pay between 7.20 GH¢ or US$ 1.68 and 47.70 GH¢ or US$ 11.20 (at currency conversion rate of GH¢ 4.26 per US$ 1) with no cost sharing (Brugiavini & Pace, 2010). Premiums contributions are income-based, and there are four categories of income group of subscribers: core poor or the indigent, the poor, the middle-class, and the rich and very rich. Children 18 and under can get coverage through their parents.

The NHIA mandated a benefits package covering 95% of the entire disease burden in Ghana (Brugiavini & Pace, 2010). The scheme includes the following listed services retrieved from the NHIS website:

- Outpatient services – general and specialist consultations reviews, general and specialist diagnostic testing including laboratory investigation, X-rays, ultrasound scanning, medicines on the NHIS Medicines list, surgical operations such as hernia repair and physiotherapy.
- Inpatient services – General and specialist inpatient care, diagnostic tests, medication-prescribed medicines on the NHIS medicines list, blood and blood products, surgical operations, inpatient physiotherapy, accommodation in the general ward and feeding (where available).
- Oral health – pain relief (tooth extraction, temporary incision, and drainage), dental restoration (simple amalgam filling, temporary dressing).
- Maternity care – antenatal care, deliveries (normal and assisted), Caesarean section, post-natal care.
- Emergencies – these refer to crises in health situations that demand urgent attention such as medical emergencies, surgical emergencies, pediatric emergencies, obstetric and gynecological emergencies and road traffic accidents.
- Mental illness (NHIA, 2013).

More expensive procedures such as echocardiography, renal dialysis, heart & brain surgery, organ transplantation, plastic surgery, and HIV retroviral drugs are not covered.

Claims Payment Process

The NHIA uses an itemized fee for service (FFS) for non-insured clients, a diagnosis related groupings (DRG) for insured customers (services only), and an itemized fee for service to pay for prescriptions for the insured (National Health Insurance Scheme, 2016).

A fee for service repayment mechanism was initially utilized to reimburse health care providers. But this mechanism required time-consuming paperwork claims submission and had a

low reimbursement rate. Vendors were unsatisfied, and thereby refused to participate in the NHIS (Dixon, Tenkorang, & Luginaah, 2011; Dalinjong, & Laar, 2012). In April 2008, Ghana Diagnostic Related Groupings (GDRGs) replaced the unpopular fee for service system.

The DRGs payment method groups related diagnoses to determine the average cost of treatment in that group (NHIS, 2014). The full cost of the estimated direct cost of patient care, including anesthesia, is covered and reimbursed under GDRGs. The GDRGs also pays about 80% of the estimated overhead cost for public health facilities upkeep such as building and equipment maintenance, and utilities (Dalinjong, & Laar, 2012).

In 2012, the NHIA started experimenting with capitation, first in the Ashanti Region to assess its viability, in conjunction with the GDRGs (Dalinjong & Laar, 2012). Capitation consists of paying participating providers in advance a pre-determined fixed rate to provide a defined set of services for each enrollee for a given period (NHIA, 2013).

Enrollment and Utilization

The NHIS is a voluntary system, mainly because 80% of the population works in the informal sector, a common issue faced by most low-income countries (Jehu-Appiah et al., 2012). In 2005, NHIS only had 1.5 million members with 127 districts mutual. To date, there is a total of 170 district schemes in Ghana with a combined member registration totaling more than 10 million as of 2013. The number of NHIS active membership increased from 8,885,757 in 2012 to 10,145,196 in 2013. At the end of 2013, active membership of the Scheme stood at 38% of the national population (NHIA, 2013). The Free Maternal Care policy, introduced in July 2008 to contribute to meeting the Millennium Development Goals (MDGs) 4 and 5, provided pregnant women with free medical care. Registration under this program rose from 383,216 in 2009 to

774,009 in 2013, a total of 2,901,952 registered members (102.0% increase). There has been a significant improvement in indigent registration, which rose from 23, 238 in 2005 to 1, 231,305 million in 2013 an increase of 213%. A total of 3,943 facilities have applied for credentialing, and 3,822 (96.9%) qualified and were accredited (NHIA, 2013).

Following implementation, utilization of health care services increased. For example, in 2006 there were 597,859 outpatient department visits nationally which increased by 44% to 27,350,847 visits in 2013 (MOH, 2014). Health expenditures have also increased significantly over time, from a total of GH¢ 7,800,000 or US$ 1,832,092 in 2005 to GH¢ 183,000,000 or US$ 42,983,698 in 2008, and GH¢ 780, 800,000 or 183,397,114.88 in 2013, a 23.5% increase in 8 years.

Table 1: Summary Description of the NHIS

Feature	Description
Type	• District Mutual Health Insurance Schemes, one for each district, with a minimum of 2000 members. • Private commercial health insurance schemes. • Private mutual health insurance schemes (not eligible for subsidies from the National Health Insurance Authority.
Membership	Membership is mandatory (either via the DHMIS or a private insurance policy). Formal sector workers have involuntary payroll deductions. Social Security National Insurance Trust contributions. The informal sector is charged a premium which is income-based. Initially, there is a six-month gap between joining and being eligible for benefits.
Exemption	Some groups are exempted from paying for membership: originally SSNIT pensioners, over 70 years, under 18 years -where both parents are members, indigents. The NHIA will transfer subsidies to cover the cost of their enrollment. An indigent is defined as someone who meets four criteria: • is unemployed and has no visible source of income; • does not have a fixed place of residence according to standards determined by the scheme; • does not live with a person who is employed and who has a fixed place; and • does not have any identifiable consistent support from another person.
Benefits package	All providers must offer a minimum package, which is specified and broad. National Health Insurance Drug List is established. 95 % of all healthcare is covered – all services are included other than rehabilitation, physiotherapy, appliances and prostheses, cosmetic surgery, HIV retroviral drugs, assisted reproduction, echocardiography, photography, angiography, orthotics, kidney dialysis, Heart and brain surgery other than those resulting from accidents, cancer treatment other than cervical and breast cancer, organ transplantation, non-listed drugs, treatment abroad, medical examinations for visas, VIP wards, and mortuary services.
Eligible providers	All providers are eligible, once accredited. every five years, accreditation is reviewed. Quarterly reports to be sent to the NHIC by vendors. Providers are paid within four weeks of the claim being made to DMHIS.
Organization	NHIA was established to regulate the market, including accreditation of vendors, agreeing on contribution rates with schemes, resolving disputes, managing the NHIF, and approving cards. Benefits to be transferable across district plans. Each DHMIS to submit annual reports to NHIA and to undertake an annual audit of accounts.
Accountability	National Health Insurance Council (NHIC) established to oversee NHIA and license schemes (every two years). Made of representatives of stakeholder groups, such as Ministry of Health, Ghana Health Services, regulatory bodies, consumers, and Executive Secretary of the NHIA. Chair and Executive Secretary appointed by the President. NHIC proposes a formula for allocation of funds to Parliament for annual approval and provides an annual report to Parliament on its use of funds. Each DHMIS governed by a Board. Rules established for handling complaints against providers or schemes.

Source: *Compiled from Act 650 (2003) and LI 1809 (2004)*

Burkina Faso Direct Cost Subsidy

With an estimated 371 maternal deaths per 100,000 live births in 2015 ("Maternal mortality ratio (modeled estimate, per 100,000 live births) | Data | Table", 2016) improving access to maternal care services is a major challenge for Burkina Faso. Since the 90s, Burkina Faso has initiated various measures to alleviate financial barriers to maternal health care. In 1997, a policy abolishing the requirement for fees pre-payment for emergency services and rendering caesarean free for the poorest was introduced but never implemented (Bicaba et al. 2003).

Between 1992 and 1993, Burkina Faso launched the user fee program to increase the availability of essential drugs and other health care services, part of the health sector reform recommendations for Sub-Saharan countries at the Bamako Initiative (McPake, Hanson, & Mills, 1993; UNICEF, 1988; Garner, 1989). With the introduction of user fee, annual per capita contacts to the health facility dropped from 0.31 to 0.15, which is less than the 2.0 contacts per capita per year recommended by the WHO (Sauerborn, Nougtara, & Diesfeld, 1989). Evidence suggest that the user fee system hindered access to health care services (Ridde, 2003). The user fee system lead to less utilization of health care service, more visits of the traditional healers and an increase of at home self-care in Burkina Faso (Gnawali, Pokhrel, Sié, Sanon, De Allegri, Souares, & Sauerborn, 2009). With money being the primary reason for forgoing professional care, the country moved towards formal risk sharing mechanism offering protection against health care costs.

Consequently, in 2001, with the support of UNICEF, a cost-sharing approach was launched in the state, local communities, CSPS management committees, and the population for obstetric emergencies (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). The cost-sharing

was in the form of a Community Based Health Insurance (CBI) scheme with an objective to increase access to medical care by reducing the financial barriers to the rural population at the point of service use. Introduced first in the Nouna Health District, it then extended to all ten districts (Richard et al. 2007; Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). To further increase access and reduce the maternal mortality rate, the law incorporated free preventive prenatal care in 2002 (De Allegri, Ridde, Louis, Sarker, Tiendrebéogo, Yé, & Jahn, 2012).

After striving for many year to make basic obstetric care accessible in primary health care centers (Centres de Sante´ et de Promotion Sociale, CSPS), and complete obstetric services in district hospitals (medical centres with surgical units, CMA), Burkina Faso was able to launch the national subsidy for deliveries and emergency obstetric and neonatal care (EmONC) (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). In October 2006, the government of Burkina Faso adopted a policy to subsidize emergency obstetric. The primary objective of the policy was to increase the coverage of facility-based deliveries and caesarean sections by reducing the costs for patients (Belaid, & Ridde, 2014). Unlike other countries in the region such as Mali, Senegal or Ghana with total fees abolition, Burkina opted for an 80 % coverage of deliveries, obstetric complications and caesarean sections costs (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011).

Policy Formulation Process and Content

Level of Subsidy

Three subsidy level options were suggested 60%, 80%, and 100%. An 80 percent subsidy was selected based on efficiency and sustainability. First, an assessment of the subsidy's impact on maternal mortality at 100% and 80% revealed an insignificant variance. Bases on simulations, a coverage at 100% will result in a decreased of maternal deaths from 484 in 2005 to 105 per

100,000 live births in 2015; while the 80% coverage would reduce it to 122 per 100,000 live births (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). Second, there was a desire to retain a level of population contribution (i.e. cost sharing). The policy covers 80% of the direct costs for emergency obstetric care, 80% of uncomplicated deliveries in the district hospitals and health centers, and 60% of uncomplicated deliveries in regional and national hospitals (Ministry of Health, 2006).

Reimbursement and Budgeting

The EmONC policy opted for a fixed-rate reimbursement (lump sum flat fee). The policy guidelines describe the clinical protocol for each childbirth - uncomplicated, complicated (dystocic labor) and caesarean (Belaid, & Ridde, 2014). Caesareans reimbursement cost was estimated at 55,000 F CFA or US$ 89.85 (at currency conversion rate of 612.1 per 1 dollar), including 10 000 F or US$ 16.34 cost of transportation between the PHC and the district hospital. For normal deliveries, repayment cost was set at 4,500 F CFA or US$ 7.35 for a normal delivery, comprising the price of the delivery kit (medicines and consumables) (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). The EmONC policy guidelines provide all the items to be included in the delivery package (Ministry of Health, 2006). The out of pocket cost for patients is 11,000 F CFA or US$ 17.97 for cesareans and 900 F CFA or US$ 1.47 for normal deliveries, representing a 20% contribution (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). Hospitals were reimbursed at 60% to motivate deliveries in CSPSs, making the patient contribute 40% at hospitals or 1,800 F CFA or US$ 2.94.

In theory, the indigents are exempted from all childbirth costs. However, in reality, the policy's implementation guide only briefly describes some criteria for identifying and selecting this population (Ministry of Health 2006), making population identification difficult. In total,

thirty billion F CFA (52.26 million US$), of which 5 billion F CFA (8.7 million US$) was set for the indigents, and earmarked in the national budget to pay for the EmONC policy for the period of 2006-2015.

Implementation Processes

Although the Council of Ministers adopted the cesareans subsidy policy on March 2006, it was not implemented in public hospitals until October 2006 and the policy was not extended to CSPSs until January 2007 (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). Although the national budget encompassed service subsidies and disbursements, it did not include funding for policy support activities. Communications activities took place late in the process. While the information was disseminated to women in urban areas through television and radio, most women in rural settings were only made aware of the subsidy at the time of delivery. Interpretation of the policy's content and its provisions also posed a problem. Ambiguities existed about what services were covered, full exemption of the indigents, and allocation of transportation funds (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011). Nonetheless, the policy reimbursement system was efficient, with almost no delays in reimbursing the districts on a fixed-rate. Over time, the reimbursement rate nearly doubled, and since the policy had no provision on addressing the issue, districts had discretionary decision power on how to utilize the surplus. Some used it to subsidize the remaining 20%, others for vaccination campaigns (Ridde, Richard, Bicaba, Queuille, & Conombo, 2011).

Statement of the Problem

The move toward UHC in some developing countries was in part a response to two of the millennium development goals, namely reducing infant mortality and improving maternal health

outcomes. By making health care more accessible and affordable, policy makers hoped that more women would seek care during their pregnancy and thereby improve their health outcomes.

Despite improvement over time, health care accessibility remains an issue in most developing countries like Ghana and Burkina Faso. Albeit slow a decrease, maternal and child mortality rates remain high compared to developed countries. Ghana's maternal mortality rate decreased from 467 deaths per 100,000 live births in 2000 to 319 deaths per 100,000 live births in 2015 (WHO, UNICEF, UNFPA, The World Bank & UNPD, 2015). The under-five mortality rate declined from 101 deaths per 1,000 live births in 2000 to 62 deaths per 1,000 live births in 2015. Neonatal mortality went from 42 deaths per 1,000 live births in 1990 to 28 deaths per 1,000 in 2015 and infant mortality from 80 deaths per 1,000 to 43 in 2015. Newborn deaths account for 40 percent of under-five mortality in Ghana (UNICEF, WHO, World Bank Group, & United Nations, 2015).

Burkina Faso's indicators are worse than those of other nations with similar socioeconomic profiles and health care spending levels (Bliss & Streifel, 2014). Maternal mortality rate decreased from 547 deaths per 100,000 live births in 2000 to 371 in 2015 (WHO et al., 2015). The under-five mortality rate declined from 186 deaths per 1,000 live births in 2000 to 89 deaths per 1,000 live births in 2015. Neonatal and infant mortality went from 46 and 103 deaths per 1,000 live births in 1990 to 27 and 61 deaths per 1,000 in 2015 respectively (UNICEF et al., 2015).

This study thus seeks to assess the impact of each policy (NHIS free maternal care policy and EmONC 80% subsidy) independently on the utilization of maternal care services after years of implementation. The study is a dual evaluation of the impact of the free maternal policy and

the EmONC on the utilization of maternal care services as a measurement of success (or failure) in improving maternal health and infant outcomes in Ghana and Burkina.

Purpose of the Study

The need for research that addresses both the gaps in the literature, as well as, provides information useful for a comprehensive health system reform were the impetus for the present study. The NHIS, as an incremental health policy with national and sub-regional implementations, provides any future health system reform in sub-Saharan countries the opportunity to learn from the lessons and challenges faced by this country to ensure a strong foundation from which to base future reforms. NHIS free maternal care policy is such a pioneer health policy in the region; it is imperative it be evaluated to determine if the objectives set forth are being accomplished. However, Burkina Faso subsidy policy could be the answer for countries with limited resources striving to improve maternal and infant health outcomes. The objective of this dissertation is to evaluate the effectiveness of each maternal policy at assuring accessibility of maternal care services and improving infant health outcomes. More specifically the study aims to:

- Examine the effect of the Free Maternal Care Policy has had on maternal health service utilization in Ghana.
- Examine the effect EmONC 80% subsidy has had on maternal health service utilization in Burkina Faso.
- To review the effect that the NHIS Free Maternal Care Policy has had on infant health outcomes in Ghana.
- To examine the effect that the EmONC 80% subsidy policy has had on infant health outcomes in Burkina.

The findings from this study have significant policy implications for how health care, particularly maternal and child health care is designed and delivered in developing countries.

Research Questions

This study seeks to answer the following specific questions:

1. How effective was NHIS free maternal policy at increasing the utilization of maternal services?
2. How effective was the EmONC 80% subsidy policy at increasing the use of maternal services?
3. How effective was the NHIS free maternal care policy at improving infants' health outcomes?
4. How effective was the EmONC 80% subsidy policy at improving infants' health outcomes?

Theory and Hypotheses

Maternal Care Service Utilization

H1: All things being equal, women are more likely to use prenatal care services after the implementation of the free maternal care policy compared to before the policy.

H2: All things being equal, women are more likely to use prenatal care services after the EmONC compared to before the EmONC.

H3: All things being equal, women are more likely to use skilled birth attendants during labor and delivery after the free maternal care policy compared to before the policy.

H4: All things being equal, women are more likely to use skilled birth attendants during labor and delivery after the EmONC compared to before the EmONC.

H5: All things being equal, women are more likely to have postnatal check-up visits after the free maternal care policy, compared to before the policy.

H6: All things being equal, women are more likely to have postnatal check-up visits after the EmONC, compared to before the EmONC.

Infant Health Outcomes

H7: All things being equal, children are less likely to die before the age of 1 month after the free maternal care policy compared to before the policy.

H8: All things being equal, children are less likely to die before the age of 1 month after the EmONC compared to before the EmONC.

H9: All things being equal, infants are less likely to die after the free maternal care policy compared to before the policy.

H10: All things being equal, infants are less likely to die after the EmONC compared to before the EmONC.

Significance of the Study

This study has great socio-economic implications for developing countries, as most grapple with how to develop and maintain affordable and sustainable health systems. Prior studies have evaluated the impact of the NHIS on access to affordable health care. However, few have carried a dual summative evaluation of both Ghana free maternal care policy (introduced as part of the law in 2008, three years after implementation) and Burkina Faso subsidy policy of emergency obstetric services, on the utilization of healthcare services and infant health outcomes.

This study contributes directly to the still sparse literature on the expansion of universal health insurance programs in Africa. The findings will provide valuable insights to other developing countries trying to model their health insurance scheme after Ghana's NHIS or Burkina Faso EmONC. The study may also serve as a building block for future research. Findings from this study may provide necessary feedback for policy modification that may help strengthen the policies and assure their sustainability.

Table 2: Study Research Questions and outcomes

Research Questions	Outcomes
1. How effective was the NHIS free maternal care policy at increasing the utilization of maternal services?	Prenatal care, skilled birth attendant at delivery, post-natal care visits
2. How effective was the EmONC 80% subsidy policy at increasing the utilization of maternal services?	Prenatal care, skilled birth attendant at delivery, post-natal care visits
3. How effective was the NHIS free maternal care policy at improving infants' health outcomes?	Neonatal mortality, Infant mortality
4. How effective was the EmONC 80% subsidy policy at improving infants' health outcomes?	Neonatal mortality, Infant mortality

Organization of the Study

This dissertation consists of six chapters. Chapter one covers the background of the study: the problem statement, key research questions, the study objectives, and its significance. Chapter two provides a critical review of relevant literature on maternal health globally, in sub-Saharan Africa, in Ghana, and in Burkina Faso. Chapter three discusses the theory that underpins this study: The Andersen's health behavior model. Chapter four describes the research design, the data collection methods, and analysis. In chapter five, major findings related to the research questions and the study objectives are presented. Chapter six provides a discussion of the key findings and the study implications for theory, policy, and programming. It also discusses the major limitations to the study and offers recommendations for further research.

Conclusion

Populations living in low-income countries face inadequate and expensive health care. Many have opted for the establishment of a national or community-based health insurance system in an attempt to extend access to care to their most vulnerable inhabitants. Ghana is one of those pioneer countries that have implemented a national health insurance scheme with full coverage of maternal services. Burkina Faso has attempted to expand access to maternal services

by implementing an 80% subsidy policy. This study aims at assessing each policy separately regarding their impact on maternal health services utilization and infant health outcomes.

This chapter laid the foundation for the study by providing background information on the problem and delineating the research questions to be answered. It presented the rationale for this study and discussed the potential implications of the findings from the assessment of the effectiveness of each policy. Chapter 2 will present a review of all relevant literature on patterns of health care utilization and children health outcomes within each country context. Chapter 3 will present the conceptual framework for the study. Chapter 4 outlines the study's methodology. It will describe the research design, data source, sampling method and sample size, and data collection instruments for this study. Chapter 5 presents the results of the study, while Chapter 6 discusses the findings and its implications for policy and social change as well as recommendations for future research.

CHAPTER 2: REVIEW OF THE LITERATURE

Introduction

The purpose of health insurance is to increase access and use of affordable services, improve health outcomes, and diminish the financial consequences of ill-health (Yip, Hsiao, Chen, Hu, Ma, & Maynard, 2012). This section presents a review of the relevant literature about social insurance reforms and maternal and child health. The chapter begins by describing the current state of maternal and infant health at the global, regional and country level. The next section provides a review of the literature on various maternal policies throughout sub-Saharan Africa. Additionally, there will be a discussion on the literature relevant to health services utilization and infant health outcomes. Lastly, an overview of the countries in the center of the study, namely Burkina Faso and Ghana, is presented.

Global Trends in Maternal and Child Health Outcomes

Worldwide, an estimated 400 million individuals lack access to one or more necessary health services (WHO, 2015). Yearly, about 100 million people are impoverished, while another 150 million people suffer financial hardship due to out-of-pocket health expenditure (WHO, 2015). Therefore, affordability of quality basic health care services is paramount, especially in developing countries with limited resources and high maternal and infant mortality rate.

In 2000, the United Nations (UN) introduced 8 Millennium Development Goals (MDGs) to reduce poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. All goals were set to be achieved by 2015, each with identified indicators to monitor progress from baseline levels in 1990. Two of the set goals focused on maternal and child health – reduce under-five mortality rate by two-thirds and maternal mortality ratio by

three-quarters (WHO, 2015). Globally under-five mortality dropped from 12.7 million in 1990 to 5.9 million in 2015 (a 53.5% decrease), the number of neonatal deaths declined from 5.1 million in 1990 to 2.7 million in 2015 (a 47% decrease) (UNICEF et al., 2015). These estimates show a slower decline in neonatal mortality as compared to the decrease in overall under-five mortality; therefore, neonatal deaths now represent a larger share of total under-five deaths. Of the six million child deaths reported globally in 2015, 2.8 million (46%), died within the first 28 days of birth (UNICEF, 2015). Between 1990 and 2013, the maternal mortality ratio dropped from 523,000 to 289,000 per 100,000 live births (a 44.7% decrease) (WHO, UNICEF, The World Bank, UNPD, 2014). Only a third or 62 countries have met MDG 4 of a two-thirds reduction in under-five mortality. Despite significant strides, progress remained insufficient to reach MDG 4 and 5 in many regions, particularly in sub-Saharan Africa, Central and Southern Asia, and Oceania (United Nations, 2015).

Based on the unmet goals of 2015, UN countries are now transitioning from the MDGs to the Sustainable Development Goals (SDGs). The aim is to reduce the global maternal mortality ratio to less than 70 per 100,000 live births and under-five mortality by 25 or less per 1,000 live births by the end of 2030 (United Nations, 2015). Accelerating the rate of the decline is a prerequisite to achieving SDGs target on child survival, mainly in sub-Saharan Africa countries with high mortality rates (UNICEF et al., 2015).

Trends in Maternal and Child Health Outcomes in Developing Countries

While maternal mortality rates are declining globally, they remain high in developing countries, where approximately 99 percent of the global maternal deaths in 2015 occurred. Maternal death is defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any

cause related to or aggravated by the pregnancy or its management, but not from accidental causes" (WHO, 2015). The maternal mortality ratio in developing countries is 20 times higher than in developed countries, with a ratio of 239 per 100,000 live births in developing countries as opposed to 12 per 100,000 live births in developed countries (WHO, UNICEF, UNFPA, World Bank Group, & United Nations Population Division, 2015). Furthermore, women in developing countries have a higher lifetime risk of maternal death – 1 in 49,000 – with increased risk for frequent pregnancies (WHO, 2015).

Under-five and neonatal mortality rates are also catastrophic in developing countries. Children in developing countries are ten times as likely to die before age five as children in developed countries ("WHO | Child mortality," 2016). The neonatal mortality rate, as a share of the under-five deaths, is projected to increase by 7% in the next 15 years in developing countries (WHO, UNICEF, UNFPA, World Bank, 2015). Acute lower respiratory infections, mostly

- pneumonia (19%)
- diarrhea (18%)
- malaria (8%)
- measles, (4%)
- HIV/AIDS (3%)
- and conditions, such as pre-term birth, birth asphyxia, and infections (37%)

account for about 70% of all child deaths ("WHO | Child mortality", 2016), all of which are preventable causes with known and cost-effective interventions. For instance, 500,000 malaria-related under-five children deaths each year could be prevented with the use of insecticide-treated bed nets, shown to reduce under-five mortality rates by up to 20% ("WHO | Child mortality," 2016).

Therefore, ensuring access to quality pre-pregnancy, antenatal, intrapartum, childbirth, and postnatal care is vital to the mother and child survival (UNICEF, 2015). Unfortunately, due to inequalities in access to health care services and a gap between the rich and the poor, many mothers and babies in developing countries do not receive the necessary care.

Trends in Maternal and Child Health Outcomes in the Sub-Saharan Region

Sixty-six percent of all maternal deaths in developing occurred in sub-Saharan Africa (WHO, UNICEF, UNFPA, World Bank, 2015). The likelihood of a child dying before age five in sub-Saharan Africa is 14 times higher than in developed countries (WHO, UNICEF, UNFPA, World Bank, 2015). Though the region has seen a decline in under-five mortality rates, with the average annual rate of reduction increasing from 1.6% in 1990 to 4.1% in 2015, it still has the highest under-five mortality rate (WHO, 2016).

According to the UNICEF (2015), 47 of the 195 countries will still not meet SDGs goal of 25 deaths per 1,000 live births by 2030, without an acceleration of their current child survival rate. Thirty-four out of these 47 countries (72.3%) are sub-Saharan African countries. Promoting the utilization of maternal care services throughout the pregnancy (antenatal and intrapartum), having the assistance of skilled professionals at labor and delivery, and completing postnatal care are key interventions proven effective in reducing maternal mortality (WHO, UNICEF, UNFPA, World Bank, 2015; Zere, Kirigia, Duale, & Akazili, 2012; Ali, Osman, Abbaker, & Adam, 2010). These proven interventions need to be implemented to help achieve the goal of reducing maternal and child health (UNICEF, 2015).

Utilization of Maternal and Child Health Services in Developing Countries

Prior studies have established a relationship between UHC and increased access and improved quality of the services provided, suggesting that UHC can help canalize efforts to

secure optimal newborn and child health (Latko et al., 2011). UHC assures that everyone receives needed health services (prevention, promotion, curative, rehabilitation, and palliative care) at an affordable cost (Cotlear, Nagpal, Smith, Tandon, & Cortez, 2015). It ensures that all citizens, including the most vulnerable, poor and excluded - have access to quality, integrated healthcare services. Mogford (2004) in his study stated that access to primary care and skilled care during childbirth could be the difference between life and death for a mother and child.

Most women die from preventable or treatable complications during or after pregnancy and childbirth (WHO, 2015). Severe bleeding, infections, high blood pressure, complications from delivery, abortion, malaria, and AIDS are the leading cause of maternal mortality in developing countries (WHO, 2015). Ending preventable diseases and complications is the key to accelerating the process of improving mother and child in sub-Saharan Africa, according to WHO (2015). Complications during childbirth alone account for three-quarters of the total maternal deaths occurring in the region (WHO, UNICEF, UNFPA, World Bank, 2015). Complications during childbirth can have negative consequences on child survival. Neonatal deaths, which account for 45% of the total under-five-year-old mortality rate, are primarily attributable to premature birth or low birth weight, infections, asphyxia, and birth trauma (WHO, 2016).

Studies suggest that high coverage and quality of essential packages of care could avert 67% of neonatal and child deaths in developing countries. Up to two-thirds of newborn deaths and 88% of pregnancy-related deaths could have been prevented with proper utilization of antenatal care services, the assistance of skilled professionals at labor and delivery, and postnatal care follow-up (Kunst & Houweling, 2001). Unfortunately, only 40% of pregnant women in developing countries have the suggested antenatal visits (WHO, 2015). Other studies also found

a positive correlation between the presence of skilled professionals during birth and increased survival rate (Martines et al., 2005; Koenig et al., 2007; Tilaley et al., 2008; Lawn et al. 2009; Mrisho et al., 2011). Nonetheless, 150 million births occur outside of health care facilities worldwide (Lawn et al., 2009). Further, quality maternal services during the postnatal period have been shown to contribute to improved neonatal health outcomes as mother's health is closely linked with newborn survival (Du Preez, 2010; Tinker & Ransom, 2012).

What are the factors influencing health care utilization in the context of the developing world? According to Rebhan (2011), many forgo medical service because of lack of access, cultural barriers, or due to the influence of their social networks. The author defines access as the ability to utilize service taking into consideration economic, geographic, availability of services, and availability of resources. Culture is defined as the values, practices, meanings, and beliefs acquired through enculturation, while social networks make reference to family or community support that can motivate or impede health service use (Campinha-Bacote, 2003).

Several studies have provided evidence to support the impact of economic and geographic barriers to health care access. Two of such studies associated lower cost of delivery care with increased utilization of health care service in Mauritania and Afghanistan (Renaudin et al., 2007; Mayhew et al., 2008). Likewise, distances to the nearest health care facilities have been shown to have an influence on the utilization of services. The likelihood of attending a medical facility during birth significantly diminishes with travel distance (Bloom, Wypij & Gupta, 2001). Further, receiving the right information can influence the use of service. The mother's level of educational attainment often affects health-seeking behavior. Numerous other studies have demonstrated that education increases a mother's predisposition to seek care, her ability to assimilate good childcare practice as well as improved nutrition and sanitation practices

(Shultz, 1993; Basu, & Stephenson, 2005; Abuya, Ciera, & Kimani-Murage, 2012). A meta-analysis that examined the relationships between women's economic, educational and empowerment status and maternal health care utilization in 31 developing countries found that the odds of having a skilled professional assist during childbirth increased with education and wealth (Ahmed, Creanga, Gillespie, & Tsui, 2010). Similar correlations were found between education, the use of family planning, and the attendance of prenatal visits. Women with a higher empowerment score were more prone to use contraception, and have four or more prenatal visits (Ahmed, Creanga, Gillespie, & Tsui, 2010).

In a study conducted in rural Nepal, Mesko et al. (2003) revealed that religion, customs, and beliefs could be a strong determinant of health-seeking behavior. Often in African cultures, most first exhaust traditional healers' resources before seeking health care services (Abdullahi, 2011). In countries like Burkina Faso, Ghana, Mali, Zambia, and Nigeria, for example, herbal medicine is the primary source of treatment for children suffering from malaria (WHO, 2000; Abdullahi, 2011). A person with conceptual incompatibility would be unlikely to utilize available health care, because the treatment may conflict with the person culturally rooted knowledge of illness (Young & Young-Garro, 1982). For instance in South Africa, it is believed that an early reveal of pregnancy can lead to stillbirth (Du Preez, 2012). Therefore, some women wait until the last trimester of their pregnancy before visiting a doctor.

Such barriers to health care utilization are what motivated the implementation of Ghana NHIS in 2005. A number of other countries, including Nigeria, Benin, Kenya, and Burkina Faso have implemented initiatives to increase health service utilization and to improve maternal and infant health outcomes. These efforts are consistent with the hypothesis that a low-income individual will be more inclined to seek care if provided with a subsidized health plan (Taylor,

2003). Within the Ghanaian context, many have attributed an increase in antenatal care services to the implementation of the free maternal care policy, as part of the NHIS in 2008 (Mensah et al., 2010; Nketiah-Amponsah et al., 2013).

A more detailed discussion is provided in ensuing paragraphs on the importance of and the utilization of various types of maternal health services within the context of developing nations.

Antenatal Care

Antenatal or prenatal care (ANC) aids in the early detection and management of potential pregnancy complications (Vitoria et al., 2003; Afifi & Mabrey, 2004). It provides needed interventions to ensure positive pregnancy outcomes (Zere, Kirigia, Duale, & Akazili, 2012; Ali, Osman, Abbaker, & Adam, 2010). Also, women often receive valuable advice and are educated on the best postnatal childcare practices. Prenatal care visits can reduce or negate adverse health outcomes at delivery, and lessen neonatal mortality (Afifi & Mabrev, 2004). A 2009 study in prenatal care effectiveness and utilization in Brazil found that increased use of antenatal care had a positive effect on the reduction of low birth weight among uncomplicated pregnancies with a high risk of low birth weight (Wehby et al., 2009). Four ANC visits is a minimum requirement according to WHO as it increases the chances of getting effective promotive and preventive maternal health interventions (Ahmed, Creanga, Gillespie, & Tsui, 2010; WHO, 2012; Ahmed, Li, Liu, & Tsui, 2012).

Despite efforts to promote ANC visits, only 53% of pregnant women worldwide received the recommended four antenatal visits; in low-income countries, this figure was a disappointing 36% between 2005 and 2010 (Finlayson, & Downe, 2013; WHO, 2010). Out of 100 women aged 15-40, 30 do not receive antenatal care – 46 in South Asia and 34 in sub-Saharan Africa

("UNICEF - Goal: Improve maternal health," 2016). A qualitative meta-synthesis study on reduced ANC visits in low-income countries revealed that ANC utilization is a function of the women social views – pregnancy is not perceived as a life-threatening condition, negating the need for a doctor. The perceived economic cost was found to be a significant barrier to the utilization of ANC. Lastly, dissatisfaction with the service provided prevented some women from seeking care (Finlayson, & Downe, 2013).

Skilled Birth Attendants

The presence of skilled birth attendants (SBAs) at labor and delivery has been associated with improved health outcomes in some studies. An SBA is an accredited health professional (midwife, doctor, or nurse) with trained skills to manage normal (uncomplicated) pregnancies, childbirth and in the identification, management, and referral of complications in women and newborns (WHO, 2004). An estimated 16 to 33% of maternal deaths could be prevented, and neonatal, and stillbirths' rates decreased with skilled attendants assistance (Graham, & Bullough, 2001; Crowe, Utley, Costello, & Pagel, 2012). Still, many women worldwide and especially in low-income countries prefer at home delivery to healthcare facility delivery. In sub-Saharan Africa, only half of the women get assisted by a skilled attendant during labor or delivery (UN, 2014).

The main barriers to the use of skilled birthing attendants are poverty, reliance on traditional birth attendants, traditional views and religious beliefs, poor roads and transportation systems, lack of awareness, fear of Caesarean delivery, and lack of female doctors in health facilities (Sarker, Rahman, Rahman, Hossain, Reichenbach, & Mitra, 2016; Thaddeus, & Maine, 1994). Additionally, the status of the woman in the household or the community can be predictive of their decision-making power (Shimamoto, & Gipson, 2015). Sarker et al., (2016) in

their study in rural Bangladesh found that in muslin culture, women's decision-making power are limited and often the husband, the mother-in-law, or the family has that power. In this cultural context, being attended by a skilled professional is a dishonor to the household. Even when there is access, and care is provided free of charge, Sakeah et al. (2014) found that expecting mothers married to uneducated husbands were less likely to be assisted by skilled attendants at birth in rural settings. Thus, access does not always equate to utilization, as illustrated above.

Despite the existence of literature in support of SBAs, few existing empirical studies have found evidence to support the role of SBAs in improving health outcomes. For instance, a quasi-experimental study in Burkina Faso found no significant reduction in pregnancy-related mortality because of the presence of skilled birth attendance at birth (Hounton et al., 2008). The study assessed the extent to which the Skilled Care Initiative (SCI) lead to an increase of institutional births and maternal and perinatal mortality reduction in the intervention district (Ouargaye) versus the comparison district (Diapaga) (Graham et al., 2008).

Family Planning/Contraception

Effective family planning can also contribute to the reduction of maternal deaths in developing countries, where the fertility level is very high (Ahmed, Li, Liu, & Tsui, 2012). An estimated 225 million women in developing countries, who would like to delay or stop childbearing, are not using any method of contraception (WHO, 2015). Family planning programs can help address the lack or accessibility of effective contraception by providing information, counseling and various provisional and long-lasting contraceptive methods (Wilder-Smith, 2003; Hart, 1997). Family planning is effective at preventing conception, reducing the risk of unwanted pregnancy and childbirth related mortality (Gwatkin, Bhuiya, & Victoria,

2004). Family planning /contraception prevents deaths of mothers and children by averting unintended pregnancy and reducing the need for abortion (WHO, 2015).

Free Maternal and Child Care Policy in Sub-Saharan Africa

The availability and accessibility of maternal care services are limited in most African countries, a significant reason for why the continent has the highest rate of maternal and child mortality (WHO, 2010). Health insurance plays a major role in the continuum of care service for mother and child (Browne et al., 2016). To improve the survival rate of this vulnerable group, many African countries, with the support of the international community (WHO, World Bank, Save the children- UK, UNICEF, the Millennium Project, the Commission for Africa) have embarked on reforming their healthcare and financing system. Most of these reforms have revolved around the elimination or reduction of user fees (James et al., 2006).

Evidence suggests that user fees are a barrier to the utilization of maternal services among the poor, for services such as facility-based delivery and emergency obstetric care (Diop, Yazbeck, & Bitran, 1995; Preker & Carrin, 2004; James et al., 2006). To lessen the financial burden and to increase access to healthcare services, some Sub-Saharan African countries have passed user fees removal policies. There are three categories of user fees policies:

- Fee exemption policy – reduce or eliminate fees for certain services
- Fee waivers policy - abolish fee for certain groups such as pregnant women or under-five children
- Full fee waiver policy - eliminate all fees at primary healthcare facilities (James et al., 2006).

Nigeria, Benin, Kenya, Burkina Faso and Ghana are few countries with established policies targeting populations at a national or a regional level. These policies ranged from the

free provision of tax-funded national health services to vouchers and cash transfer schemes, contribution-based mandatory Social Health Insurance (SHI) and mandated or regulated private non-profit insurances, as well as mutual and community-based non-profit health insurance plans (UNICEF, 2009). Regarding coverage, some policy only cover pregnant women while others also provide care for newborns. Some countries have a national level policy and others only provide coverage for selected regions (Richard, 2013). For example, Kenya, like Ghana, introduced user fees in the 80s, as part of the structural adjustment to help supplement the government. This system led to disparities and gaps between the rich and the poor. Therefore in June 2013, two new policies were passed: free service at all dispensaries and health centers; and free maternal care services including prenatal and post-natal care up to six weeks after delivery (normal, C-section, and complication) (Jane & Maina. 2013). Table 1 provides a summary of the countries that have abolished user fees, along with the level of coverage and the geographical area of focus.

Table 3: Summary of sub-Saharan countries with current maternal and child fee exemption policy

Country	User fees removed/exempted currently	Target population	Geographic coverage
Benin	The policy of fee exemptions for C-sections (2009)	Pregnant women with complications	National
Burkina Faso	Exemptions for ANC (2002); partial exemptions for C-sections (2006), deliveries (2007)	Pregnant women (all) + new born with complication	National
Burundi	Waiver of user fees for under-5 children and women giving birth (2006)	Expectant mothers + newborn	National
Ethiopia	Exemptions for ANC, delivery, postnatal care; hospital fee waivers for the poor (2005)	Pregnant women	National
Ghana	User fee exemptions for delivery care (2005) Free maternal care for pregnant women (2008)	Expectant mothers + newborn	Regional, then national;
Kenya	free maternal health services and delivery in all public health facilities and free primary care services (2013)	Pregnant women + newborn	Targeted regions
Mali	Exemptions for C-sections (2005)	Pregnant women with complications	National
Niger	Waivers for pregnant women and under-five children, funded by an NGO (2006)	Pregnant women with complications / new Born	Pilot in 2 districts
Nigeria	Free maternity services policy Kano State (2001)	Pregnant women + newborn	Targeted regions
Senegal	Exemptions for delivery care and C-sections (January 2005 in 5 poor areas)	Pregnant women	National, except Dakar
Serra Leone	Free care pregnant women, new mothers and children under five (2010)	Expectant mothers + newborn /lactating mother (with kids under two)	National

Many studies have evaluated the impact free maternal care policies on maternal and child health. The consensus was that removing the financial barrier was positively associated with increased utilization in most countries as well as improved health indicators. According to estimates, the removal of user fees could prevent up to 233,000 under-five deaths annually, about

6.3% of under-five deaths in Africans countries (UNICEF, 2009). However, a systematic review of 20 countries with user fee exemption conducted by Dzakpasu, Powell-Jackson & Campbell (2013) determined that most studies lack the methodical rigor to make the results reliable. Similarly, Hatt et al. (2013) found user fees abolition to have a negative, neutral, or inconclusive effect on the availability of inputs, health provider motivation, and quality of services.

The main critique of past studies on the subject was the weakness of the methodologies employed. The small scale, the lack of experimental or quasi-experimental design, data quality, and absence of a comparison group were identified as factors that limit the validity and generalizability of the results from previous policy evaluation (James et al., 2006; Lagarde & Palmer, 2008; Hatt et al., 2013). Time series or before and after with a control group methodology were deemed better for evaluating the temporal effect these policies have had on health service utilization (Hatt et al., 2013). Accordingly, this study will employ a before and after study design to evaluates the NHIS and the EmONC impact on health services use and infant health outcome. A novel approach to the evaluation of these policies based on existing literature.

The NHIS and Maternal and Child Health Services Utilization in Ghana

Inaccessibility to health care services during pregnancy and childbirth account for the high maternal and neonatal mortality rate globally (Alvarez, Gil, Hernández, & Gil, 2009; Birmeta, Dibaba, & Woldeyohannes, 2013). Antenatal care (ANC), the assistance of skilled professional during birth (SBA), and postnatal care have been touted as being effective in the management and treatment of complications leading to maternal deaths. Those interventions are critical components of the safe motherhood initiative aimed at ensuring healthy pregnancy and delivery (Zere, Kirigia, Duale, & Akazili, 2012; Ali, Osman, Abbaker, & Adam, 2010). It is

important to assess whether the utilization of these key services has increased as a result of the implementation of the NHIS in Ghana and the EmONC in Burkina Faso.

In 2014, about 97 percent of women in Ghana reported receiving ANC from skilled providers, with 87 percent of women having the recommended 4 ANC visits (WHO, 2015). Regarding delivery for the same year, 74 percent of Ghanaian women were assisted by a skilled provider during delivery (GSS, GHS, & ICF International, 2015).

A body of studies has evaluated the impact of the NHIS and the utilization of maternal care services. A mixed qualitative and quantitative study using data from a baseline assessment of the Maternal and Newborn evaluation from the Northern and Central Regions described women's experiences with the NHIS. The study found an association between insurance and skilled facility delivery, antenatal care and early care-seeking for sick children. History of insurance coverage combined with insurance during pregnancy increased the likeliness of having a facility delivery, but there was no association with the use of ANC. Those enrolled into the scheme were also more likely to seek care for their sick child irrespective of severity. However, the poor and least educated were less likely to have insurance compared to the wealthier and more educated, thus limiting their access to care. Finally, there were technical issues with women registration into the NHIS and confusion on determining exemption categories and exempted services (Singh, Osei-Akoto, Otchere, Sodzi-Tettey, Barrington, Huang, & Speizer, 2015). Bosomprah et al., (2015) in examining the relationship of NHIS membership with antenatal visits, postnatal visits, and under-five mortality, concluded that the policy was associated with increased access and the utilization of health service but not with under-five mortality. A retrospective cohort study examined NHIS free maternal care policy impact on health services use among pregnant women before or after the policy. While registration

increased, service quality was disproportionally affected. Indeed, hospital and health centers offered better quality ANC services than community health centers (Bosomprah, Ragno, Gros, & Banskota, 2015). A descriptive and cross-sectional design assessed the effect of the utilization in the Akatsi District of the Volta Region of Ghana found a correlation between NHIS and increased access to health services, health seeking behavior, access to modern medical facilities and the likelihood of health facility delivery and assistance of a trained health personnel. Though results indicated a positive effect on postnatal care, the effect on antenatal care was inconclusive (Gobah, & Liang, 2011). Likewise, Dzakpasu et al., (2012) accessed the same outcome using two randomized controlled trials conducted in the Brong Ahafo. They concluded that the provision of free care was effective at increasing facility delivery in the region, contrary to Gobah, & Liang (2011) who found no positive correlation between the NHIS and antenatal care. A recent population-based cross-sectional study shown an increase in the utilization of antenatal care services among insured women by 96% following the implementation of the free maternal care policy (Browne, Kayode, Arhinful, Fidder, Grobbee, & Klipstein-Grobusch, 2016). Likewise, the likelihood of women being assisted by a skilled professional or receiving postnatal care was found to increase by 129% and 61% respectively (Browne et al., 2016).

While many have assessed the NHIS and its implications for the mother and child, most of these studies lack the methodological rigor of the present study. Most dealt with specific regions and not the entire population. Also, these studies focus on a particular year making it difficult to evaluate trend and findings have been mixed. The present study is etiologically superior by sampling the entire population, using multiple year point data, and evaluating two

policies from two different countries side by side to shed more light on the impact of the policy on maternal utilization and children outcomes.

Context of the Present Study

Overview of Ghana

(U. S. Central Intelligence Agency, 2007)

Map 1: Map of Ghana with the 10 Regions

Ghana is a low-income country located in the center of West Africa. Ghana is bordered by Togo, Burkina Faso, and Ivory Coast. The estimated population in 2015 was 26,327,649 (Cia.gov, 2016), variably distributed into ten administrative regions. About half of the population lives in three areas: Ashanti, Eastern, and Greater Accra. Each region is subdivided into districts, and there is a total of 216 districts. The density of population is 103 persons per km2, with most living in urban areas. Ghana has an overall population growth of 2.1 percent (GSS, 2013). More

than a third of the population is under 15 and life expectancy at birth is 65.8 years. An estimated 76.6% of the population is literate, as of 2015.

The primary source of revenue in the country is the service sector, contributing up to 50 percent to the economy, followed by the industry, then the agricultural sectors. Gold, timber, industrial diamonds, bauxite, manganese, fish, rubber, hydropower, petroleum, silver, salt, limestone all constitute the natural resources of the country. The per capita gross product (GDP) is US$ 1,858. Ghana's total expenditure on health as a percentage of the GDP in 2013 was 5.4 (WHO, 2016). About 70 percent of the population works in the informal sector (GSS, 2015; DHS, 2014).

In 2003, the Ghanaian Government passed legislation, which established its own National Health Insurance Scheme (NHIS), with the goal of providing affordable and accessible health services to all Ghanaians. In 2008, the NHIS was amended to include free maternal care coverage for all pregnant women enrolled in the scheme. After years of existence, there is much interest regarding the combined impact the law and the free maternal care policy has had on the utilization maternal care services as well as its effects on infant health outcomes.

Overview of Burkina Faso

(TUBS, 2012)

Map 2: Map of Burkina Faso with the Regions

Burkina Faso is in West Africa (slightly larger than Colorado), north of Ghana. Other border countries are Benin, Cote d'Ivoire, Mali, Niger, and Togo. The population is estimated at 17.9 million as of 2016 (World Bank, 2014). The country is primarily rural (70%), with a high population growth of about 3 percent (World Bank, 2014). It has limited natural resources (such as manganese, limestone, marble, and gold) and a tropical climate characterized by dry winter and hot summer (Cia.gov, 2016). The country's economy is heavily dependent on agricultural products. The GDP was estimated at US$ 12.54 million as of 2014, with health expenditure accounting for 6.4 percent of the GDP (2013). The level of education is relatively low, with more than half of the population never attending school in 2010 (World Bank, 2014). Infrastructure wise, the country has experienced challenges, including the lack of reliable electricity and clean drinking water supply, particularly in rural areas as well as the lack of paved roads making transportation difficult ("The World Factbook," 2016).

Although Burkina Faso has progressed since the 90s, the under-five mortality rate is still high compared to other neighboring countries: under-five mortality declined from 202 deaths per 1,000 live births in 1990 to 113 per 1,000 live births in 2010 (a 44.1% decrease from 1990 level), and 88 per 1,000 in 2015 (a 56.4% decrease from 1990 level). Likewise, the burden of maternal mortality is high, with an estimated maternal mortality rates of 371 deaths per 100,000 live births in 2015 a decrease from 770 deaths per 100,000 live births in 1990 (51.8% decrease). Malaria is the number one cause of premature death in the country, followed by lower respiratory infect, and diarrheal diseases (Healthdata.org, 2013). Malaria contributes to the under-five mortality at 24% (WHO, 2014). Neonatal mortality in Burkina Faso was estimated to be 31 per 1,000 live births in 2003, 29 per 1,000 in 2010, and 26 per 1,000 in 2015 and accounts for approximately 22% of under-five deaths (WHO, 2015).

A body of research has described antenatal and obstetric care practices and assessed the impact of maternal interventions and risk factors on maternal mortality and delivery outcomes (Morris et al., 2010; Ijadunola et al., 2010; & Lewycka et al., 2010). They all recognized the benefits of those targeted but cost effective measures at improving health outcomes. Recent efforts to reduce maternal mortality in Burkina offer a potential opportunity to introduce interventions to address child mortality as well. However, scarcity of data on maternal and neonatal care and morbidity in Burkina, indispensable for establishing effective maternal and newborn survival program, renders planning difficult.

Conclusion

This chapter presented a review of the existing literature on maternal service utilization and outcomes within a global and regional context. It sought to identify gaps that could be filled by this study. Additionally, a brief description of countries in sub-Saharan Africa with established free maternal policies was given. Lastly, the countries at the center of this study were introduced with relevant information presented about their socio, economic and demographic indicators. In the next chapter, the conceptual framework for this study will be discussed.

CHAPTER 3: THEORETICAL MODEL, CONCEPTUAL, AND ANALYTICAL FRAMEWORK

Introduction

Many models and theories have been used to define and conceptualize utilization (Aday & Andersen, 1975; Kane et al., 1976). The major ones include the behavioral model, the health belief model, the three-delay model, and the economic model. In theory, there is no definitive guideline to quantify health service utilization. These models are described in ensuing paragraphs.

Competing Theoretical Models for Understanding Health Services Utilizations

The health belief model (HBM) is founded on the premise that perceptions of reality rather than objective reality influence individual behavior (Hochbaum, 1958). An individual perception is affected by health beliefs about vulnerability to a particular health threat and the magnitudes of the health problem. The perceived benefit of health services is associated with the likelihood of healthcare utilization (Rosenstock, Strecher, & Becker, 1988). The HBM emphasizes disease avoidance rather than focusing on achieving health, therefore, is not suitable for the current study (Hochbaum, 1958).

The three-delay model by Thaddeus and Maine (1994), outlines the main constraints in seeking maternal care services. The three delays – delay in deciding to seek care, delay in reaching adequate healthcare facility and delay in receiving care at that facility – are thought to be connected. Specifically, the delay in deciding to seek care feeds into the delay in reaching an adequate health care facility and, consequently the delay in receiving care at that facility. Each of these delays is enabled by key factors such as poverty or resultant socio-economic inequalities,

household demographic characteristics, health system infrastructure, and quality of care that influence the utilization and outcome (Thaddeus & Maine, 1994).

The economic model is built on the concept that individuals seek to maximize their utility by consuming a set of resources that contribute to utility maximization (Grossman, 1972). Utility denotes the satisfaction from consuming a set of goods and services and is a function of the value an individual ascribes to his/her health. Thus, an individual demands a certain level of healthcare resources that will contribute to improving his or her health, and his or her overall utility. The economic model explains the changes in demand for healthcare through demographic, economic, and social variables.

Past studies on access to care and conditions that either enable or hinder the utilization of health services have relied on Andersen's 1960s Behavioral Model of Health Services Utilization. This model was developed with three specific aims: 1) to understand why people use health care services, 2) to measure access to health care, and 3) to assist in the development of policies that would promote equitable access to health care (Andersen, 1995; Andersen & Newman, 1973). From a theoretical perspective, the present study uses Andersen's behavioral model of health care services utilization, which posits that a wide range of variables affects an individual's health services utilization.

Andersen Health Behavior Model of Service Use

Some factors such as culture, access, perception, knowledge, belief and socioeconomic and demographic factors of gender, age, and education all have an influence in the decision to utilize health care. As such factors vary, it becomes difficult to identify which ones are the most influential in choosing the optimal preventive or curative care. Various health care utilization

theories and models have been employed to help predict patterns in the use of health care. However, the Andersen behavioral model (1968, 1973, and 1995) is the most widely-used conceptual model for explaining variation in the use of health services and has been used to study access to diverse types of health services among elderly, vulnerable and migrant populations and women (Andersen, 1968, 1995, Andersen & Newman, 1973; Fan et al., 2010).

The model was developed in the 1960s to predict and explain the use of "formal personal health services" by the individual (Andersen, 1995). With much criticism over the past 40 years, it has undergone several revisions or phases (Andersen, 1995; Andersen, 2008; McDonald and Conde, 2010). The initial model focused on three groups of factors as determinants of health services use: predisposing characteristics, enabling resources and need factors, with need factors as the key determinant of service use.

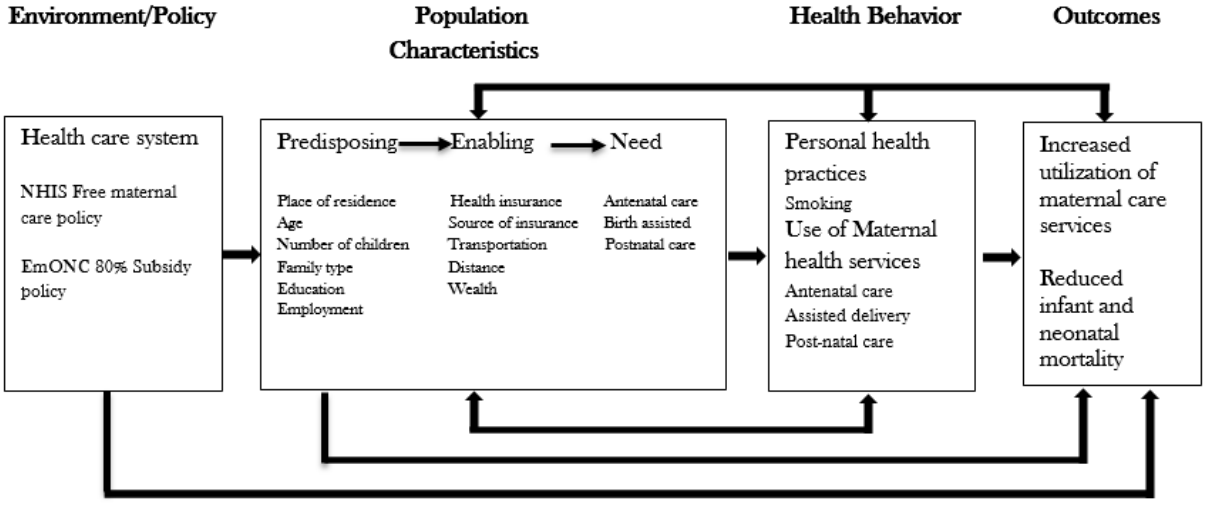
Phase 2 of the model developed in the 1970s, introduced health policy, resources, and organization, as determinants of health care services use, and patient/consumer satisfaction as an outcome or result of health services use. This model centered on enabling factors as the most mutable, therefore, the most important determinants from a policy standpoint (Aday, 2001; Andersen, 1995).

Phase 3 of the model introduced between the 1980s and 1990s, took into consideration the impact of individuals health behaviors on the use of health services. In this phase of the model, health outcomes were in part a result of health services use. Thus, both perceived and evaluated health status were added to the model as outcomes (Evans & Stoddart, 1990; Andersen, 1995).

Phase 4 of the model identified the "dynamic and recursive nature of the health services use model" and added feedback loops recognizing that health outcomes could, in turn, affect predisposing, enabling, need and behavioral factors and ultimately influence subsequent health services use (Andersen, 1995). Phase 4 has four core components: (a) environmental characteristics (health system, external community environment), (b) population/individuals characteristics (predisposing, enabling and need), (c) health behavior (personal health practices and use of health services) and (d) health outcomes (perceived and evaluated health status, consumer satisfaction) (Andersen, 1995).

The model focuses on the individual as the unit of analysis and goes beyond health care utilization by adopting health outcomes as the endpoint of interest. Given that the aim of this study is to assess the impact of Ghana's NHIS free maternal care policy and the EmONC policy on maternal health services utilization and infant health outcomes, the Andersen's behavioral model is the optimal framework for this study. Figure 1 illustrates the proposed conceptual model for this study - the Andersen's behavioral model.

Figure 1: Model for Maternal Health Care Utilization adapted from phase 4 of the Behavior Model for Health Service Use



Environment/Policy

The health care system, the political system, and the external environment all play significant roles in access to care and are important measures of health services use. Policies at the national level such as the NHIS and the EmONC have an impact on population health. The external environment also has an effect on the use of services e.g. individual are less likely to use services in politically unstable settings.

Population Characteristics

Population characteristics encompass three major sub-components, which are predisposing, enabling and need factors. **Predisposing characteristics** refer to socio-cultural features of an individual. They exist before the illness and influence the likelihood of utilizing health care services. According to the Andersen's behavioral model, some people are more inclined than others to consume health care services. Predisposing characteristics comprise demographic factors of age and gender, social structure factors of marital status, education level, profession, ethnicity, culture, and social interactions and network. Also, health beliefs, which are the attitudes, values, and knowledge towards the health care system, are characterized as predisposing factors (Andersen, 1995). Based on existing literature, age, education, employment, marital status, religion, and decision-making power have been identified as possible predictors of health care use among women and would be assessed in the present study (Babitsch, Gohl, & von Lengerke, 2012; Singh, Kumar, & Pranjali, 2014).

An individual's inclination towards the use of health services is also a function of the accessibility of the service. Factors that aid an individual to act upon a value or satisfy a need into health service use is called **enabling resources**. Therefore, even though a person can be predisposed to use health services, some circumstances must be met for such utilization to occur

(Andersen, 1968). Both community (e.g., access to health services, availability of health specialists) and personal (e.g., health insurance) enabling resources must be present to motivate the use of services (Andersen. 1995). Consistent with previous studies, the present study will examine characteristics of wealth, health insurance coverage, distance, household size and place of residence (urban-rural) as predictors of health care use (Babitsch, Gohl, & von Lengerke, 2012; Singh, Kumar, & Pranjali, 2014).

Need factors are the perceived or an actual need an individual have to use health services. Based on the assumption of the presence of predisposing and enabling conditions, an individual must perceive illness or its severity to use services. How individual assesses and reacts to symptoms, pain, and worries about his or her health will motivate use (Andersen & Davidson, 1995). Need is determined by factors like health status, health risk factors and the environment (Ying-Hock et al., 2012).

Heath Behavior

David Gochman defines health behavior as: "those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements, personality characteristics, including affective and emotional states and traits, and overt behavior patterns, actions, and habits that relate to health maintenance, to health restoration, and to health improvement." (Gochman, 1982, p. 169). These components all interact with use of health services to influence outcomes (Evans & Stoddart, 1990; Andersen, 1995). In the context of this study, smoking habits will be taken into consideration when evaluating maternal care utilization.

Health Outcomes

Health outcome measures are necessary for health policy and health reform (Andersen, 1995). Health outcome measures consumer satisfaction, health status, and perceived health. Components of consumer satisfaction are availability, quality, provider characteristics (Andersen, 1995). Consumer satisfaction and perceived health are beyond the scope of this study, but health status will be access as a proxy of service utilization, and infant outcomes.

Defining Access to Health Care According to the Andersen's Model

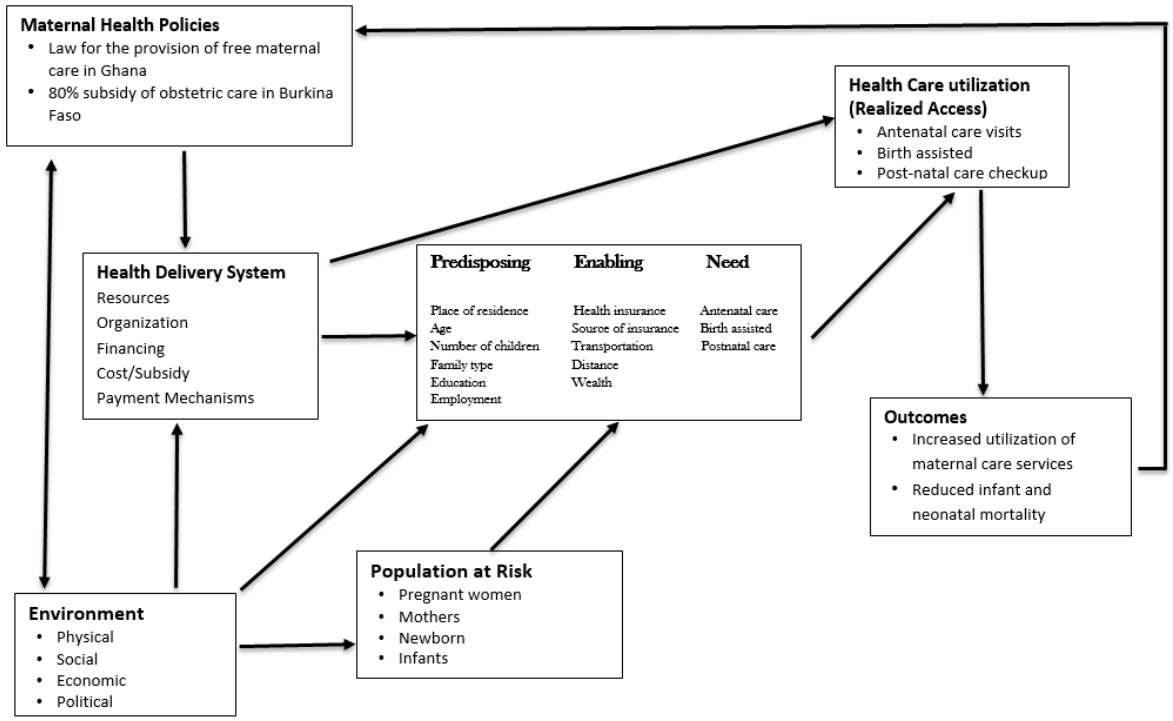
Access to healthcare is defined as 1) availability of health facilities and personnel; 2) containment of the various costs of using these facilities and personnel; 3) measurement of the actual use of health services; and 4) utilization of health services relative to some measure of apparent need of the population (Andersen and Aday, 1978). It denotes the aptitude to utilize services taking into account economics, geographic location, availability of services, and availability of resources (Rebhan, 2011). The outcome of interest in this study is the utilization of health service before, during, and after childbirth. Therefore, the aim is to determine the actual use of health care services from conception to delivery. Andersen discusses four concepts within which to describe access: potential access, realized access, equitable access, and inequitable access.

Conceptual and Analytical Frameworks

Two frameworks were used to guide the study aims and research design: the Conceptual Framework (Figure 2) provides the overall context and background that should ideally be included in the study. The Analytical Framework (Figure 3) is the actual research study framework that reflects the final models and analysis. The proposed conceptual framework and following analytical framework are adapted versions of the above theoretical framework (Figures

1) for this study. They will help define the interacting and modifying factors that influence ways a health policy impacts its target population.

Figure 2: Conceptual Framework

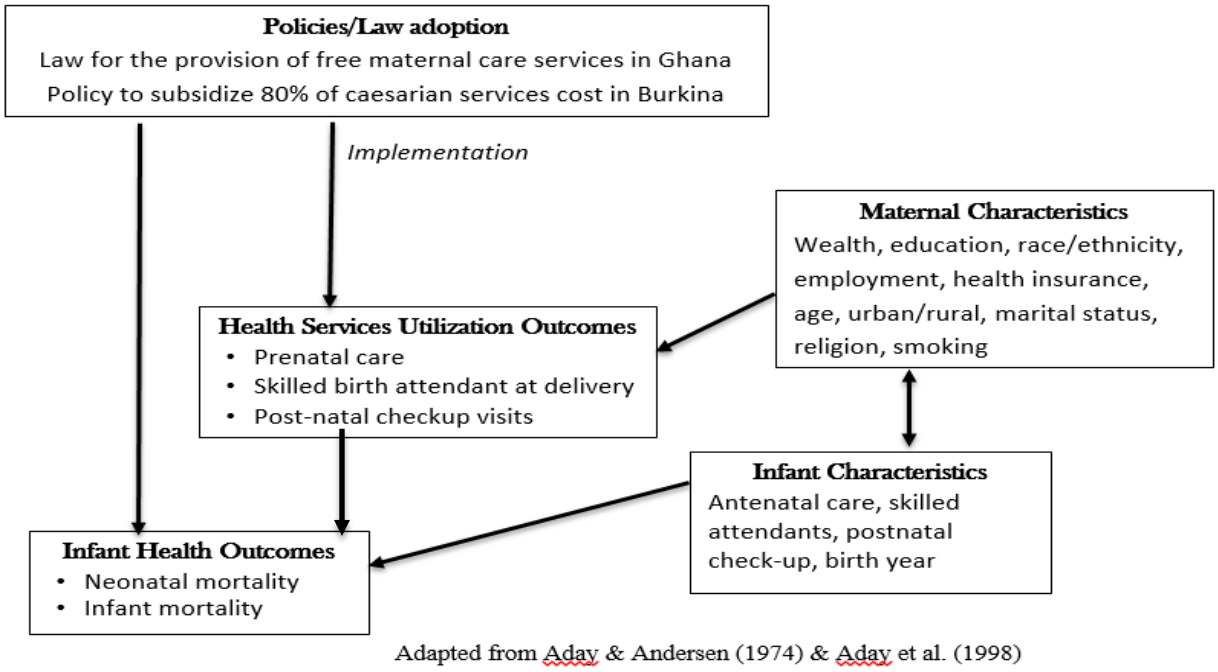


Adapted from Aday and Andersen (1974) & Aday et al (1998)

The implementation of each country's maternal policy is represented in the conceptual framework as being an essential element of the feedback loop from both the outcomes and the current physical, social, economic and political environment. The free maternal care policy in Ghana was passed as an incremental policy to the comprehensive national universal coverage (NHIS). This policy provision was implemented to address the needs of a population deemed vulnerable (mothers and children). In Burkina Faso, similar objectives pushed the adoption of a subsidized care policy aimed at making maternal services more accessible to the targeted population. It is critical to understand how each policy affects the targeted population and its related outcomes so that the lessons learned can be useful for future law or health system reform

implementation. For any policy, it is important to consider the characteristics of the health delivery system as they have an influence on the utilization and related outcomes as noted by Aday and Andersen. Though the theoretical framework shows a direct impact of the policy on the population at risk, the conceptual framework indicates an indirect relation via the health delivery system that carries out enacted policies. In the analytical framework, the link between at-risk population and the policies' targeted group (women and children) is implied, as well as how it is affected by implementation and the utilization of health care services.

Figure 3: The analytical framework



Adapted from Aday & Andersen (1974) & Aday et al. (1998)

In the analytical framework, specific maternal characteristics and determinants of health service utilization are identified. These features are intermediate to services use and have a direct influence on infant outcomes. Controlling for all these features is necessary for assessing the real impact of each policy.

Utilization of health care services in the conceptual framework emphases on realized access of the specific services covered under each policy. The three services selected in the analytical framework are quantifiable and measurable using the data available.

Ideally, the last outcome in this study to be measured would have been maternal, child and infant health. However, the available data does not allow to measure any maternal outcomes assertively. Thus, the impact of the policies since their implementation will be measured through infant outcomes. Maternal characteristics and determinants will undoubtedly influence these results, and it is critical to control for those variable to isolate the effect of the policies through the utilization of the selected health care services. The outcomes of interest will be neonatal mortality (under 29 days) and infant mortality (under one year).

Because no element exists in isolation, the present study will control for interacting and mediating variables to the extent possible in the research study design.

Table 4: Different types of Access and Measures

Type of Access	Measures	Examples
Potential Access	• Capital financing • Personal resources — Enabling Resources	• Percent of population with health insurance • Income health Insurance coverage
Realized Access	• Type of services • Site of services • Purpose of services — Use of services	• Prenatal care visits • Post-natal care • Assisted birth
Equitable Access	• Services distributed according to perceived patient need • Services distributed according to social advantage	• Education • Occupation • Wealth • Health Insurance
Inequitable Access	• Social Structure • Health beliefs • Enabling resources — Use of Services	• Health insurance • Health facilities • Transportation • Income

Adapted from Anderson & Davidson (1999).

Potential access is the presence of enabling resources, allowing the person to seek care if needed (Andersen, 1978). Potential access in this study is represented by the implementation of the NHIS free maternal policy in Ghana and the EmONC policy in Burkina Faso. **Realized access** represents "the actual use of care" (Andersen, 1978) as a result of policy. Based on those definitions, potential access facilitates realized access. Further, the Andersen framework makes a distinction between equitable and inequitable access. **Equitable access** is driven by demographic characteristics and needs whereas **inequitable access** is a result of the social structure, health beliefs, and enabling resources. **Effective access** is attained when the use of health services improves health status or satisfaction toward the service. **Efficient access** is the minimization of the cost of health services while maximizing health status or satisfaction with received service (Andersen, 1996).

The concept of access to health care services entails complex analysis. Access to health care can be approximated by quantifying the number of individuals in need of care as compared to the number that received care through the health care system. In the context of this study and based on Andersen's definition of access, potential access will be assessed against realized access as well as effective and efficient access.

Likewise, access to health care services will be measured by the availability of services such as:

- Prenatal, skilled professional, and postnatal check-ups,
- The ability to provide equitable health care services (in rural and urban areas),
- The existence of personal, financial, organizational, social, and cultural barriers to accessing health care services.

Conclusion

Behaviors leading to the use of health services are complex and multifaceted. This chapter introduced the Anderson Health Utilization Model. This model is based on three categories of determinants that lead to the use of services: predisposing characteristics which present the proclivity to utilize health care services, enabling characteristics with are the resources necessary to access care, need characteristics are influenced by an individual perception about it health status. Then the conceptual and analytical framework guiding the study aims and research design were presented. The conceptual framework provides an overview of the context and background of the study. The analytical framework painted a picture of the actual research study framework that reflects the final models and analysis.

CHAPTER 4: METHODOLOGY

Introduction

This study uses data from the Development Health Survey (DHS) program. The program was established by the United States Agency for International Development (USAID) in 1984. It was designed as a follow-up to the World Fertility Survey and the Contraceptive Prevalence Survey projects. The project has been implemented in overlapping five-year phases: DHS-I ran from 1984 to1990; DHS-II from 1988 to1993; and DHS-III from 1992 to1998. In 1997, DHS was folded into the new multi-project MEASURE program as MEASURE *DHS+*. DHS survey data have been used extensively by researchers on subjects like fertility, contraceptive, health services, and child health research all over Africa, Asia, the Near East, Latin America, and the Caribbean ("The DHS Program - Data," 2016).

The DHS surveys used in this study were conducted in 2003 and 2010 in Burkina Faso and 2003 and 2014 in Ghana. The data are representative of all women aged 15-49 years in both countries and results can be generalized to the entire population of women in those age categories residing in Burkina and Ghana with the use of the appropriate statistical weighting methodologies.

This chapter describes the aims of the study and associated hypotheses, data collection methods and variables, and statistical methods employed in the analyses of the stated assumptions. All statistical analyses account for the characteristics of a complex survey design, i.e., sampling weights, stratification, and clustering.

Theoretical Framework

This study is guided by Andersen's Behavioral Model of health service use (Aday & Andersen, 1974). This model is described in detail in Chapter 3. According to the model, health

service use is a function of three components: predisposing characteristics, enabling resources, and need factors. Predisposing characteristics help identify individuals with an inclination to use health services as compared to other. Age, education, employment, marital status, religion, and decision-making power have been identified as possible predictors of health care use among women for the present study.

Identifying the personal or community resources needed by an individual to access health care is a requirement to assess the utilization of health services. The present study will examine characteristics of wealth, health insurance coverage, distance, household size and place of residence (urban-rural) as predictors of service use.

In this study, the utilization of maternal services is assessed by evaluating the number of prenatal care visits (PNC), facility-based delivery (FBD) and use of post-natal care services (PNC). The second outcome of interest, infant outcomes, is assessed through neonatal and infant mortality.

Research Design

This study applies a dual before and after evaluation design, using Ghana and Burkina Faso. Ghana has an established and functional national insurance program for all, with a supplemental free maternal care policy. Burkina Faso is yet to establish a national insurance program. However, the country has implemented an 80% subsidy for facility-based delivery. The effectiveness of the free maternal health policy and the subsidized user-fee program is assessed separately, using a before and after bivariate comparison of key indicators, and multivariate regression analysis. To evaluate the impact of each policy on antenatal care, assisted delivery, postnatal care, neonatal and infant mortality, data obtained from the Demographic and Health Survey completed in each country will be used. For each country, the year 2003 is the selected

baseline (before policy implementation) and year 2010 and 2014 the end line for Burkina Faso and Ghana respectively.

A before and after using data from pooled Demographic Health Survey (DHS) for Ghana is performed to measure the difference in the utilization of health care service by pregnant women before (2003 data) and after (2014 data) implementation of the NHIS. Then data from Burkina demographic health survey (BDHS) is used to perform a before and after evaluation of the accessibility of the accessibility of maternal health care in the country before (2003 data) and after (2010 data) the implementation of EmONC policy.

The before and after test is adequately suited for policy or program evaluation. However, such design always poses a threat to the validity - internal validity (whether the intervention produced the change) and external validity (whether the results are likely to apply to other people and situations).

Even though the before and after study design is appropriate for the present study, one limitation comes from the data depth. Quality data are not readily available in most developing countries. Undeniably, household survey data in emerging nations are readily available now than before due to improved statistical capacity both nationally and internationally (Prydz, 2013). Still, progress in strengthening data systems is slow while the demand for quality and updated data is increasing (Eele, 2015). The data used for this study were obtained from the DHS program, with six rounds of surveys in Ghana and four rounds in Burkina Faso. Data are available from the year 2003 to the year 2010 and 2014 for Burkina Faso and Ghana respectively.

The Demographic and Health Survey Data (DHS)

This study uses data from the Demographic and Health Survey (DHS). Since inception in 1988, there have been six rounds of standard DHS surveys in Ghana and four in Burkina Faso. The survey is nationally representative and covers all regions of each country. The main objective of the DHS is to provide current and reliable data on fertility and family planning behavior. Also to provide data on infant and child mortality, breastfeeding, antenatal care, children's immunizations and childhood diseases. In addition, the survey collects information on nutritional status of mothers and children, use of maternal and infant health services, and awareness and behavior regarding AIDS and other STIs. These data are publicly available, and all identifiers have been removed by DHS. The ensuing paragraphs present information obtained from the final DHS reports and summarizes the methods and procedures used for the different surveys in Burkina Faso and Ghana. Additional information can be found in the final DHS report for each country (Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF International, 2015; Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), & ORC Macro, 2004; Institut National de la Statistique et de la Démographie (INSD) & ICF International, 2012; Institut National de la Statistique et de la Démographie (INSD) & ORC Macro, 2004).

Ghana: 2003, and 2014 Sample Design

DHS has had six series of population and health surveys conducted in Ghana as part of the Global Demographic and Health Surveys (DHS) Program. The Ghana Statistical Service (GSS), the Ghana Health Service (GHS), and the National Public Health Reference Laboratory (NPHRL) of the GHS implemented the surveys (Ghana Statistical Service (GSS) et al., 2015). The GDHS follows a two-stage sample design and allows estimates of key indicators at the

national level as well as for urban and rural areas and each of Ghana's 10 administrative regions. The first stage involved selecting sample points (clusters) consisting of enumeration areas (EAs). An EA is a geographic area covering an average of 145 households.

The 2003 GDHS used a two-stage stratified sample design based on the 2000 Ghana Population and Housing Census. At the first stage of sampling, 412 sample points or EAs were selected, each with probability proportional to size, based on the number of households. A complete household listing exercise was carried out between May and June 2003 within all the selected EAs (clusters). The second stage of selection involved systematic sampling of households from this list. The sample selected per EA varied by region depending on the population size. Fifteen households per EA were chosen in all the regions except in Brong Ahafo, Upper East, and Upper West regions, where 20 households per EA were selected, and in the Northern region, where 16 households per EA were chosen. The objective of this exercise was to ensure adequate numbers of complete interviews to provide estimates for relevant population characteristics with acceptable statistical precision. Due to the disproportional number of EAs and different sample sizes selected per EA among regions, the household sample for the 2003 GDHS is not self-weighted at the national level (GSS et al., 2004). Weighting factors are, however, included in the file.

The 2014 GDHS followed a two-stage sample design and was intended to allow estimates of key indicators at the national level as well as for urban and rural areas and each of Ghana's 10 administrative regions. The first stage involved selecting sample points (clusters) consisting of enumeration areas (EAs) delineated for the 2010 PHC. A total of 427 clusters were selected, 216 in urban areas and 211 in rural areas. The second stage involved the systematic sampling of households. A household listing operation was undertaken in all the selected EAs in

January-March 2014, and households to be included in the survey were randomly selected from the list. About 30 households were selected from each cluster to constitute the total sample size of 12,831 households. Because of the approximately equal sample sizes in each region, the sample is not self-weighted at the regional level, and weighting factors have been added to the data file so that the results will be proportional to the national scale. All women age 15-49 who were either permanent residents of the selected households or visitors who stayed in the household the night before the survey were eligible to be interviewed.

Response Rate

2003 GDHS- A total of 6,628 households were selected in the sample, of which 6,333 were occupied. The difference between selected and occupied households is mainly due to structures being vacant or destroyed. Successful interviews were conducted in 6,251 households, yielding a response rate of 99 percent. In the households interviewed in the survey, a total of 5,949 eligible women age 15-49 were identified; interviews were completed with 5,691 of these women, yielding a response rate of 96 percent. In the same households, a total of 5,345 eligible men age 15-59 were identified, and interviews were completed with 5,015 of these men, yielding a male response rate of 94 percent.

2014 GDHS - A total of 12,831 households were selected for the sample, of which 12,010 were occupied. Of the occupied homes, 11,835 were successfully interviewed, yielding a response rate of 99 percent. In the interviewed households, 9,656 eligible women were identified for individual interviews; interviews were completed with 9,396 women, yielding a response rate of 97 percent. In the subsample of households selected for the male survey, 4,609 eligible men were identified, and 4,388 were successfully interviewed, yielding a response rate of 95 percent.

The lower response rate for men was likely due to their frequent and longer absences from the household.

Burkina Faso: 2003, and 2010 Sample Design

DHS has had four series of population and health surveys conducted in Burkina Faso as part of the Global Demographic and Health Surveys (DHS) Program. The survey was implemented by the National Institute of Statistics and Demography (INSD) with the support of the Demographic Health Survey program (MEASURE DHS) of ICF International, the "Laboratoire du Centre Régional de Transfusion Sanguine de Ouagadougou" (CRTS/O) and the "Laboratoire du Centre National de Recherche et de Formation sur le Paludisme (CNRFP)". The objective was to provide robust socioeconomic, demographic, and sanitary indicators for the population, for women age 15- 49, and all men age 15 to 59. The International Development (USAID), United Nations Population Fund (UNFPA), United Nations Children's Emergency Fund (UNICEF), World Bank, the Cooperation Néerlandaise, and governmental budget all finance the DHS survey.

The 2003 BFDHS used a two-stage stratified sample design. At the first stage of sampling, 400 sample points or EAs were selected, each with probability proportional to size, based on the number of households. A complete household listing exercise was carried out between June and December 2003 within all the selected EAs (clusters). The second stage of selection involved systematic sampling of families from this list. The sample selected per EA varied by region depending on the population size. Twenty-six households per EA were chosen in all urban regions, and 23 households per rural EA were chosen. The objective was to ensure adequate numbers of completed interviews to provide estimates for relevant population characteristics with acceptable statistical precision. Due to the disproportional number of EAs

and different sample sizes selected per EA among regions, the household sample for the 2003 BFHS is not self-weighted at the national level. A total sample size of the 9,097 households' generated 12,477 surveyed women ages 15-49 and 3,605 individuals' men 15-49. Eligible for interview were all women 15-49 permanent resident of the selected households or visitors who stayed in the household the night before the survey and all men 15-49 from one household out of three.

The 2010 BFDHS followed a two-stage sample design and was intended to allow estimates of key indicators at the national level as well as for urban and rural areas in each of 13 administrative regions. The first phase involved of choosing clusters of enumeration areas (EAs). A total of 574 clusters were selected, 176 in urban areas and 398 in rural areas. The second phase consisted of a systematic selection of households. A household listing operation was undertaken in all the selected EAs from May 2010 to January 2011, and households to be included in the survey were randomly selected from the list. About 26 households were selected from each urban cluster and 23 in each rural cluster to constitute the total sample size of 15,000 households. Because of the approximately equal sample sizes in each region, the sample is not self-weighting at the national level, and weighting factors have been added to the data file so that the results will be proportional at the national level.

All women age 15-49 who were either permanent residents of the selected households or visitors who stayed in the household the night before the survey were eligible to be surveyed. Half of the households were selected for the men interviews and all men 15-49 residing or visiting the night prior to the survey were eligible.

Response Rate

2003 BFDHS- A total of 9,470 households were selected in the sample, of which 9,149 were occupied. Successful interviews were conducted in 9,097 households, yielding a response rate of 99 percent. In the households interviewed in the survey, a total of 12,952 eligible women age 15-49 were identified; interviews were completed with 12,477 of these women, yielding a response rate of 96 percent. In the same households, a total of 3,984 eligible men age 15-59 were identified, and interviews were completed with 3,605 of these men, yielding a male response rate of 91 percent.

2010 BFDHS- A total of 14,947 households were selected for the sample, of which 14,536 were occupied. Of the occupied households, 14,363 were successfully interviewed, yielding a response rate of 99 percent. In the interviewed households, 17,656 eligible women age 15-49 were identified for individual interviews; interviews were completed with 17,087 women, yielding a response rate of 98 percent. In the subsample of households selected for the male survey, 7,506 eligible men age 15-49 were identified, and 7,307 were successfully interviewed, yielding a response rate of 97 percent.

Instrumentation - Questionnaire

Three questionnaires are employed in the DHS to collect the data: the household questionnaire, the woman's questionnaire, and the man's questionnaire. These questionnaires, which are based on standard DHS questionnaires, were adapted to reflect the population and health issues relevant to each country. The final questionnaires are prepared in English for Ghana and in French for Burkina and then translated into the major local languages.

The household questionnaire was used to list all the members and visitors of the selected households. Basic demographic information was collected on the characteristics of each person

listed, including age, sex, marital status, education, and relationship to the head of the household. For children under 18 years old, parents' survival status was determined. The data on age and sex of household members obtained in the Household Questionnaire were used to identify women and men who were eligible for individual interviews. The Household Questionnaire also included questions on child education as well as the characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor of the dwelling unit, and ownership of various durable goods.

The women's questionnaire contains information of all women of reproductive ages 15-49 years. Information from the individual women's questionnaire (specifically, the birth data set) was used in this analysis. These women were asked questions about their health and their children for the last five years before the survey. Topics captured include education, residential history, media exposure, knowledge and use of family planning methods, fertility preferences, antenatal and delivery care, breastfeeding and feeding practices, vaccinations and childhood illnesses, childhood mortality, marriage and sexual activity, woman's work and husband's background characteristics, and awareness and behavior regarding AIDS and other STIs. Also, it provides information on the sex, survival status, the age of death of a child, as well as the empowerment indicators of the women within the household.

The Men's Questionnaire was administered to a sample of men age 15-59 in some of the households (1 in 3 in 2003 and half of the households in 2010 and 2014. The Men's Questionnaire is similar to the Women's Questionnaire but much shorter because it did not collect reproductive history or maternal and child health and nutrition information.

Variables Construction and Definition

Variable construction was done using all available data. Survey questions were coded to capture the appropriate categories and outcomes needed for proper analysis. Comparison of the individual questions and response categories was necessary to determine if all four surveys (GDHS 2003 and 2014 and BFDHS 2003 and 2010) kept all key results. Some variable were re-coded to assure conformity and for logistic regression analysis. Additional variables and categories were created for clarity purposes such as religion, employment, distance, and smoking.

Once the variables were determined for each survey year, all the individual datasets had to be appended in Stata to create one larger dataset. The researcher created additional year and country variables to ensure that the survey could identify each dataset. Some variable were dropped from the dataset for the final analysis due to significant missing data.

Outcome Variable

Prenatal Care: the number of antenatal care visits during pregnancy, coded 0 for less than four visits, and coded 2 for four or more visits

Skilled Attendant at Labor and Delivery: whether a woman delivered at a health care facility or home with a trained birth attendant (coded as 1) or if she delivered at home with an untrained birth attendant, with family, alone or other (coded as 0).

Post-natal checkup: whether a mother and newborns received post-natal care service at a health facility after birth 1 = Yes and 0 = No.

Neonatal Mortality: A child is coded 1 if they died before 28 days post-delivery and 0 if they died after 28 days or alive at the time of the interview.

Infant Mortality: A child is coded 1 if deceased before 365 days post-delivery and 0 if deceased at 365 days or if alive at the time of the interview.

Independent Variables

Table 5: Independent variables description and coding

Independent variable	Coding
Education	Women education level is coded 0 if she reported no education, 1 if she completed primary school, 2 if she completed secondary school and 3 if she completed anything above secondary school.
Marital status	Women's marital status was coded as follows: 0 - never married; 1- single, 2- married.
Religion	Religion was coded as 1- Christian, 2- Muslim, and 3- Traditional, and 4- other
Wealth index	The study assesses wealth using a wealth index provided in the dataset. The index if created following a factor analysis of several socioeconomic variables and the presence of amenities such as a TV, radio, cell phone**.**
Health insurance	Coded as 1 (yes) if a woman had insurance at the time of the survey and no, if otherwise.
Unemployment	A woman was coded as 1 if employed and 0 if unemployed at the time of the survey.
Urban/Rural	Urban residence is coded as 0, and rural residence is coded as 1.
Smoker	The smoking variable is coded as follows: 1 for smoker and 0 for non-smoker
Age	A woman is coded as 0 if between age 15-19, 1 for age between 20- 29, 2 for 30-39 and 3 for 40-49 years of age.
Decision-maker	1= self/respondent, 2= joint decision, 3 = husband alone or someone else
Distance	This variable was coded 0 = distance a small problem, and 1 = distance is a big problem
Household size	This a count variable to determine the size of the family of the respondent
Region	10 region in Ghana and 14 in Burkina Faso
For child outcomes models, the following additional variables were evaluated:	
Stillbirths	Stillbirths were coded as 1 if the mother had a child die after 6 months of pregnancy, and 0 if the mother had not had a child die during her six+ months of pregnancy.
Birth Spacing	This was coded as 1 if the mother had three or more children during the past five years from the survey and 0 if the mother had less than three children during those five years.
Breastfed Child	This was coded as 1 if the mother reported having breastfed the focal child and 0 if she reported not breastfeeding the focal child.
Child Gender	This was coded 1 if the child was born as male and 0 for female.
Premature Birth	A child was coded as 1 if the mother answered that the child was born before 37 weeks and 0 if the mother answered no
Low Birth Weight	A child was coded 1 if child weighed less than 2500 g at birth. A child was coded as 0 if weight was more than 2500g at birth

Data Collection and IRB

This study's analyses examine the relationships between the implementation of the NHIS free maternal care policy and the 80% obstetric care subsidy and the utilization of care services and infant health outcomes separately. Authorization to use the data was obtained from MEASURE DHS by providing a brief description of the study through their website. Approval for data utilization for this study was obtained from the data originator before the data was extracted from their web platform. The DHS interviewers obtained informed consent from all the study participants. Because this study utilizes secondary deidentified data, the study is considered exempt for IRB purposes. IRB approval was obtained from the Georgia Southern University Institutional Review Board.

Data Analysis Methods

This research is a secondary data analysis of four cross-sectional demographic household and health survey datasets: the GDHS 2003 and 2014, BFDHS 2003 and 2010. The analysis was restricted to women who had given birth once within 3 years of the survey date (note that each survey provided information on the birth history of mothers even for births predating the survey year). Thus, data were restricted to women reporting births in 2001-2003 for the survey year 2003 and births in 2008-2010 for the survey year 2010. Due to limited sample size for Ghana, data were expanded to include births within four years of the survey date (2010-2013) for the survey year 2014. Births in 2014 were excluded as the survey was conducted in within the first quarter of the year. Research questions and corresponding hypotheses will be tested using the individual women and births' datasets for years 2003-2014. Variable and statistical modeling analysis will use the relevant data (see definition of variables).

The Births' dataset was used in this study. It has one record for every child ever born to interviewed women. Essentially, it is the full birth history of all women surveyed. It includes information on pregnancy, postnatal, and immunization records for children born in the last five years. This file can be used to calculate health indicators and fertility and mortality rates. The unit of analysis in this file is any children born of eligible women ("The DHS Program - Dataset Types," 2016). This study utilized the birth's dataset and restricted analysis to women with a single birth during the study period.

Univariate and Bivariate Analysis

Data was analyzed, first using descriptive statistics including frequencies, means, and standard deviation. The use of descriptive methods helped depict health service utilization and infant health outcomes in Ghana and Burkina Faso during the four cross-sectional survey periods. Appropriate parametric statistical tests such as t-test and chi-square analysis were used to examine bivariate relationships. Descriptive tests were also performed to ensure that the assumptions of all subsequently employed multivariable analysis were met. Also, correlation analysis was conducted to eliminate the presence of significant correlation among independent variables (i.e. multi-collinearity). However, statistical bivariate results were not sufficient to establish the strength of the association between the variables and the study aim. Each covariate was also contextualized in current theoretical knowledge to define final statistical model inclusion or exclusion.

Multivariable Analysis

Since all outcomes were binary, multivariate logistic regression was used to account for survey design, including sampling units, and weights and to adjust for potential confounding. Different multivariable regression models were conducted based on the characteristics of the

outcome variable. Multivariate logistic regression helped to predict the outcome of interest by continuous and categorical independent variables and to determine the degree of variance in the outcome of interest explained by independent variables. Furthermore, logistic regression allowed the "ranking of relative importance of independent variables; to assess the interaction effects; and to understand the impact of covariate control variables" (Garson, 2016).

Data were analyzed using the Stata 14 statistical software for Windows. Statistical significance was assessed at $p < 0.05$ level. Robust standard errors were obtained for all models. Models were accounted for clustering of mothers in the respective administrative districts for each country.

Justification

The conceptual and analytical frameworks, based on the literature review, guided the variable constructions and ensured that all study aims and research questions were addressed by the analysis building on previous studies. Variables were explored to determine sample size, missing data characteristics, correlations, and collinearity. Standard errors for all variables were calculated to assure comparability between surveys for each country.

Methodological Limitations

One of the most significant methodological limitations of this study is its reliance on self-reported information provided by the mothers. Therefore, recall bias may limit the study's internal validity. Further, as with all observational studies, the study could not adjust for all possible confounding factors and as a result, may suffer from omitted variable bias.

Table 6: Analyses Methods for the Study Hypotheses and Main Variable

Hypothesis	Dependent Variable	Independent Variable	Analytic Method
1: All things being equal, prenatal care utilization is higher after the free maternal care (FMC) policy compared to before the FMC. 2: All things being equal, prenatal care utilization is greater after the EmONC compared to before the EmONC	antenatal care	1.FMC Law 2.EmONC policy	Multivariate logistic regression
1: All things being equal, skilled birth attendants are more likely to be present at labor and delivery after the FCM compared to before the FMC 2: All things being equal, skilled birth attendants are more likely to be present at labor and childbirth after the EmONC compared to before the EmONC	Skilled Birth Attendants	1.FMC Law 2.EmONC policy	Multivariate logistic regression
1: All things being equal, more women have post-natal check-up visits after the FMC compared to before the FMC 2: All things being equal, more women have post-natal check-up visits after the EmONC compared to before the EmONC	Post-natal care	1.FMC Law 2.EmONC policy	Multivariate logistic regression
1: All things being equal, neonatal mortality is lower after FMC compared to before FMC. 2: All things being equal, neonatal mortality is lower after EmONC compared to before EmONC	Neonatal Mortality	1.FMC Law 2.EmONC policy	Descriptive statistics
1: All things being equal, infant mortality is lower after FMC compared to before the FMC. 2: All things being equal, infant mortality is lower after EmONC compared to before the EmONC.	Infant Mortality	1.FMC Law 2.EmONC policy	Descriptive statistics

*additional variable in the model includes age, race/ethnicity, education, employment, wealth, religion, birth spacing, marital status, stillbirths, health insurance, distance to facility, urban/rural, social support, transportation, decision maker, gender, breastfed, smoking, twin.

Conclusion

This chapter described the research design, the data, key measures and analytical plan for the study. The study utilizes pooled data from the 2003 to 2014 iterations of the country-specific DHS for Ghana and Burkina Faso. The study employs a before and after design to evaluate the effects of each country's maternal health policy on health services utilization and infant health outcomes. Logistic regression multivariable analyses are used in the study. The next chapter, Chapter 5 presents the results of the study. Chapter Six follows with a discussion of the policy and research implications of the study findings.

CHAPTER 5: RESULTS

Introduction

Health policy experts have been advocating for Universal Coverage as a means to provide affordable and accessible health insurance in many developing countries. Ghana took a step in 2003 with the introduction of a comprehensive nationwide health insurance program for all its citizens, and later passed an incremental policy targeted at the most vulnerable part of it population- mothers and children. Since 2008, all pregnant women in Ghana had access to free maternal services as long as they registered (for free) for the NHIS. Similarly, to improve accessibility and affordability, Burkina Faso passed the EmONC policy in 2006, providing an 80% subsidy for emergency delivery and obstetrics care.

To date, few rigorous studies have been conducted to measure the success of the NHIS free maternal care policy and the EmONC 80% subsidy in relation to health care utilization and child health outcomes. The primary purpose of this study was to evaluate the effects of the NHIS free maternal care policy and the EmONC 80% subsidy on health service utilization and child health outcomes.

Each of the study's hypotheses was analyzed using the various statistical techniques and mathematical models identified in chapter 4. The aim of this chapter, therefore, is to report the findings of this research and to provide a basis for either accepting or rejecting the various hypotheses. The chapter also explains the results of the analyses conducted to test the hypothesis and answer the research question. The results of the research questions are addressed in the following discussion.

Descriptive Statistics

Tables 7 presents stem from the descriptive analysis of the pooled sample from Burkina Faso. The analytical sample included 14,159 women who had given birth once during the study period (i.e. within three years of the survey year). Results from the univariate analysis show that most women had completed at least four antenatal visits (73.5%), had been delivered by a skilled birth attendant (55.0%) and had received postnatal checkup (67.2%). Less than five percent of babies born had died within one month (1.9%) and one year (4.8%), respectively. Much of the women were married (96.4%), with no formal education (85.2%), were unemployed (85.8%), lived in rural areas (84.5%), identified themselves as Christians (62.1%) and were non-smokers (95.5%). Most made decisions jointly with their partners (79.7%). Less than half (46.8%) identified the distance to health facilities as a big problem. On their birth outcomes, the majority of births were males (50.9%), vaginally-delivered (98.5%), singleton births (98.2%). More than ten percent of these births were Low birth weight babies (12.7%). Nine out of ten women (86.3%) breastfed their babies. The mean age of the sample was 29 years. The average household size and the wealth index were 8.4 and 0.18, respectively. The women in the study sample were somewhat equally distributed across the 14 regions of Burkina Faso (Table 7).

Results from a correlation analysis are presented in Table 8. All independent variables included in the multivariable analysis were correlated to test for the presence of multicollinearity among variable pairs. The correlation coefficient for all variable pairs was under 0.65, the widely-used standard for the determination of multi-collinearity.

Table 7: Descriptive statistic - Burkina Faso

Variable	Definition	Unweighted N	Unweighted %	Weighted %
Dependent variables 2001 to 2010				
Antenatal Care	Denotes the number of antenatal visits during pregnancy 0= 4 or more visits; 1 = less than 4			
> 4 visits		9,542	72.2	73.5
< 4 visits		3,673	27.8	26.5
Skilled attendant	Delivered at a health care facility or home with a trained birth attendant; 0=No; 1= Yes			
No		6,115	43.2	45.0
Yes		8,044	56.8	55.0
Post-natal checkup	Mother and newborn received post-natal care at the health care facility 0 = No; 1 = Yes			
No		3,486	31.7	32.8
Yes		7,513	68.3	67.2
Neonatal mortality	1 = a child died before 28 days post-delivery; 0 = died at or after 28 days or alive at the time of the interview			
At / After 28 days		5,064	98.1	98.1
Before 28 days		96	1.9	1.9
Infant Mortality	1 = deceased before 365 days post-delivery; 0 = deceased at or after 365 days or alive at the time of the interview			
At/After 365 days		13,483	95.2	95.2
Before 365 days		676	4.7	4.8
Independent variables from 2001 to 2010				
Birth year				
2001		1,945	13.7	13.2
2002		2,396	16.9	17.0
2003		2,021	14.3	14.3
2008		2,529	17.8	18.0
2009		2,916	20.5	20.6
2010		2,352	16.6	16.9
Marital Status				
Single	0	605	4.3	3.6
Married	1	13,554	95.7	96.4
Education	The level of education			
No education	0	11,883	83.9	85.2
Primary	1	1,518	10.7	9.8
Secondary	2	714	5.0	4.5
Above secondary	3	41	0.29	0.42
other	9	3	0.02	0.03
Unemployed	Employment status			
Unemployed	0	12,282	86.7	85.8
Employed	1	1,874	13.2	14.2
Religion	Religion practice			
Christian	1	8,903	63.0	62.1
Muslim	2	3,580	25.3	27.7
Traditional	3	1,573	11.1	9.4
Others	4	103	0.73	0.80
Decision maker	Who makes health related decisions			
Self	1	1,004	7.3	7.0
Joint	2	1,789	13.0	13.3

Husband/someone else	3	10,969	79.7	79.7
Distance is problem	Is distance to health facility a problem			
Small problem	0	7,528	53.2	52.6
Big problem	1	6,626	46.8	47.4
Rural	living in an urban or rural area			
Urban	0	2,844	20.1	15.5
Rural	1	11,316	79.9	84.5
Smoker	Smoking habits			
Non-smoker	0	13,486	95.3	95.5
Smoker	1	666	4.7	4.5
Sex of child	What is the child gender			
Male	0	7,223	51.0	50.9
Female	1	6,936	49.0	49.1
Breastfed	Breastfeeding habits			
No	0	1,835	13.9	13.7
Yes	1	11,378	86.1	86.3
LBW	How much did child weight at birth			
> 2,500g	0	6,452	87.3	87.3
< 2,500g	1	940	12.7	12.7
Singleton	Number of kids per birth			
1 or more	0	270	2.0	1.8
Single	1	13,889	98.0	98.2
C-section	Delivered by C-section			
No	0	12,990	98.5	98.5
Yes	1	205	1.5	1.5
Region				
Ouagadougou	1	880	6.2	8.9
Boucle de Mouhoun	2	981	7.0	5.3
Centre	3	702	5.0	6.3
Centre-Sud	4	1,012	7.1	6.9
Plateau central	5	1,180	8.3	7.1
Centre-Est	6	1,127	8.0	8.1
Centre-Nord	7	1,051	7.4	6.7
Centre-Ouest	8	1,353	9.6	9.1
Est	9	1,144	8.0	10.1
Nord	10	1,122	8.0	9.0
Cascades	11	1,003	7.0	4.3
Hauts Bassins	12	1,088	7.7	10.4
Sahel	13	1,014	7.2	5.8
Sud-Ouest	14	502	3.5	2.0
Continuous Independent Variables		N	Unweighted Mean (std)	Weighted Mean(std)
Age	Age in years	14,158	29.28 (0.064)	29.15 (0.071)
Wealth Index	Composite measure of wealth	14,155	0.179 (0.007)	0.162 (0.008)
Household Size	Number of people in household	14,158	8.42 (0.043)	8.35 (0.051)

Table 8: Correlation Analysis Matrix

	1	2	3	4	5	6	7	8	9	10	11	12
1. Birth year	1.00											
2. Age	-0.12	1.00										
3. Marital status	0.14	0.08	1.00									
4. Education	0.03	-0.10	-0.09	1.00								
5. Unemployed	0.12	-0.10	-0.01	0.13	1.00							
6. Religion	-0.34	0.01	-0.03	-0.11	-0.13	1.00						
7. Decision maker	0.00	-0.07	0.08	-0.09	0.06	0.00	1.00					
8. Wealth index	-0.01	-0.07	-0.05	0.20	0.09	-0.02	-0.04	1.00				
9. Distance is problem	0.00	0.02	0.02	-0.14	-0.07	0.06	-0.01	-0.06	1.00			
10. Rural	-0.04	0.03	0.09	-0.40	-0.20	0.13	0.08	-0.21	0.21	1.00		
11. Household size	-0.17	0.23	-0.05	-0.09	-0.08	0.13	0.04	0.02	0.02	0.09	1.00	
12. Smoker	-0.07	0.17	0.02	-0.07	-0.06	0.07	-0.01	-0.02	0.03	0.09	0.06	1.00

Table 9 presents result from the descriptive analysis of the pooled sample from Ghana. The analytical sample included 5,483 women who had given birth once during the study period (i.e. within three years of each survey year). Results from the univariate analysis show that many the majority of women had completed at least four antenatal visits (82.1%), had been delivered by a skilled birth attendant (61.3%) and had received postnatal checkup (77.2%). Less than five percent of babies born had died within one month (1.9%) and one year (3.1%), respectively. The majority of the women were married (84.2%), with at least primary school education (68.4%), were unemployed (86.4%), lived in rural areas (56.8%), identified themselves as Christians (54.9%), were non-smokers (99.6%) and were uninsured (42.1%). Most made decisions jointly with their partners (38.4%). Less than a third (30.7%) identified the distance to health facilities as a big problem. On their birth outcomes, the majority of births were male (51.9%), vaginally-delivered (89.8%), singleton births (97.4%). Less than ten percent of these births were birth weight babies (8.5%). Six out of ten women (59.9%) breastfed their babies. The mean age of the sample was 31 years. The average household size and the wealth index were 5.4 and 0.71, respectively. The women in the study sample were somewhat equally distributed across the ten regions of Ghana (Table 9).

Results from a correlation analysis are presented in Table 10. All independent variables included in the multivariable analysis were correlated to test for the presence of multicollinearity among variable pairs. The correlation coefficient for all variable pairs was under 0.65, the widely-used standard for the determination of multi-collinearity.

Table 9: Descriptive Statistics – Ghana

Variable	Definition	Unweighted N	Unweighted %	Weighted %
Dependent variables 2001 to 2014				
Antenatal Care	Is the number of antenatal visits during pregnancy 0= 4 or more visits; 1 = less than 4			
< 4 visits		986	19.1	17.9
> 4 visits		4,174	80.9	82.1
Skilled attendant	Delivered at a health care facility or home with a trained birth attendant; 0=No; 1= Yes			
No		2,314	42.2	38.7
Yes		3,169	57.8	61.3
Post-natal checkup	Mother and newborn received post-natal care at the health care facility 0 = No; 1 = Yes			
No		1,157	26.5	22.8
Yes		3,203	73.5	77.2
Neonatal mortality	1 = a child died before 28 days post-delivery; 0 = died at or after 28 days or alive at the time of the interview			
At/After 28 days		5,382	98.2	98.1
Before 28 days		101	1.8	1.9
Infant Mortality	1 = deceased before 365 days post-delivery; 0 = deceased at or after 365 days or alive at the time of the interview			
At/After 365 days		5,308	96.8	96.9
Before 365 days		175	3.2	3.1
Independent variables from 2001 to 2014				
Insurance	Did you have insurance			
No	0	3,173	57.9	59.2
Yes	1	2,310	42.1	40.8
Birth year				
2001		692	12.6	12.3
2002		909	16.6	16.5
2003		680	12.4	12.3
2010		457	8.3	8.7
2011		668	12.2	11.9
2012		953	17.4	17.5
2013		1,124	20.5	20.8
Marital Status				
Married	0	784	14.3	15.8
Single	1	4,699	85.7	84.2
Education	Level of education			
No education	0	2,067	37.7	31.6
Primary	1	1,115	20.3	20.8
Secondary	2	2,142	39.1	45.2
Above secondary	3	159	2.9	3.4
other	9			
Unemployed	Employment status			
Unemployed	0	4,747	86.7	86.4
Employed	1	731	13.3	13.6
Religion	Religious practice			
Christian	1	2,893	52.8	54.9
Muslim	2	1,109	20.2	21.2
Traditional	3	1,087	19.8	17.5

Others	4	394	7.2	6.4
Decision maker	Who makes health related decisions			
Self	1	1,326	27.3	30.0
Joint	2	1,952	40.2	38.4
Husband/someone else	3	1,576	32.5	31.6
Distance is problem	Is distance to health facility a problem			
Small problem	0	3,576	65.2	69.3
Big problem	1	1,905	34.8	30.7
Rural	living in an urban or rural area			
Urban	0	2,067	37.7	43.2
Rural	1	3,416	62.3	56.8
Smoker	Smoking habits			
Non-smoker	0	5,452	99.5	99.6
Smoker	1	29	0.5	0.4
Sex of child	What is the child gender			
Male		2,823	51.5	51.9
Female		2,660	48.5	48.1
Breastfed	Breastfeeding habits			
No	0	2,008	38.9	40.1
Yes	1	3,151	61.1	59.9
LBW	How much did child weight at birth			
> 2,500g	0	2,273	90.9	91.5
< 2,500g	1	228	9.1	8.5
Singleton	Number of kids per birth			
1 or more	0	142	2.6	2.6
Single	1	5,341	97.4	97.4
C-section	Delivered by C-section			
No	0	4,718	91.5	89.8
Yes	1	438	8.5	10.2
Region				
Western	1	533	9.7	10.0
Central	2	495	9.0	10.2
Greater Accra	3	497	9.1	15.7
Volta	4	424	7.7	7.7
Eastern	5	508	9.3	10.0
Ashanti	6	631	11.5	17.6
Brong Ahafo	7	640	11.7	9.8
Northern	8	796	14.5	11.5
Upper West	9	534	9.7	3.8
Upper East	10	425	7.8	3.7
Continuous Independent Variables		N	Unweighted Mean (std)	Weighted Mean (std)
Age	Age in years	5,483	31.14 (0.101)	31.15 (0.120)
Wealth Index	Composite measure of wealth	5,483	0.631 (0.012)	0.712 (0.157)
Household Size	Number of people in household	5,483	5.68 (0.038)	5.44 (0.039)

Table 10: Correlation Analysis Matrix- Ghana

	1	2	3	4	5	6	7	8	9	10	11	12
1. Birth year	1											
2. Age	0.04	1										
3. Marital status	0.20	0.14	1									
4. Education	0.12	-0.10	-0.03	1								
5. Unemployed	0.05	-0.20	-0.07	0.05	1							
6. Religion	0.07	0.07	0.05	-0.26	-0.02	1						
7. Decision maker	-0.05	-0.09	0.04	-0.10	0.08	0.05	1					
8. Wealth index	0.16	-0.00	0.02	0.24	0.08	-0.05	-0.05	1				
9. Distance is problem	-0.10	-0.03	-0.00	-0.25	-0.03	0.05	0.06	-0.17	1			
10. Rural	-0.11	-0.03	-0.02	-0.34	-0.08	0.04	0.05	-0.26	0.28	1		
11. Household size	-0.06	0.26	-0.02	-0.29	-0.05	0.13	0.10	-0.08	0.14	0.20	1	
12. Smoker	0.03	0.08	0.01	-0.07	-0.01	0.02	0.04	-0.03	0.03	0.02	0.05	1

Multivariable Analysis – Burkina Faso

Antenatal Care Utilization

Table 11 presents result from a multivariable logistic regression model examining factors associated with the completion of antenatal visits in Burkina Faso. Compared to 2001, in 2003 women were less likely to complete four or more antenatal visits (OR=0.695, 95% CI [0.560 - 0.863]). However, between 2008 and 2010, the odds of completing four or more antenatal visits increased by up to 80%, compared to 2001.

Other factors associated with the likelihood of completing four or more antenatal care visits (ANC) were: completing more than secondary education (OR=11.190. 95% CI [3.765 - 33.255]), or secondary education (OR=2.279, 95% CI [1.811- 2.867] or primary education (OR=1.444 - 95% CI [1.245 - 1.675]) versus no education; and living in the Centre-Sud Region (OR=2.035, 95% CI [1.636 - 2.531]).

Variable found to be negatively associated with the likelihood of completing a least four antenatal visits were: identifying as a traditionalist (OR= 0.686 - 95% CI [0.576 - 0.818]); reporting that distance to health facility is a problem (OR=0.850, 95% CI [0.774 - 0.934]); living in a rural area (OR=0.746, 95% CI [0.651 - 0.855]); and living in the Boucle du Mouhoun (OR=0.706, 95% CI [0.556 - 0.897], the North (OR=0.358 - 95% CI [0.546 - 0.867]), the Hauts Bassins (OR=0.359, 95% CI [0.276 – 0.466]), and the Sud-Ouest (OR=0.678, 95% CI [0.467 - 0.984]) regions (as compared to Ouagadougou).

Table 11: Logistic Regression - Factors Associated with Completion of Antenatal Care Visit Burkina Faso

Antenatal Care Visits	**Odd ratio**	**Robust Standard Error**	**P > |z|**	**95% Confidence Interval**	
Birth year (Reference = 2001)					
2002	0.914	0.089	0.359	0.755	1.106
2003**	0.695	0.076	0.001	0.560	0.863
2008***	1.814	0.175	<0.001	1.501	2.193
2009***	1.768	0.169	<0.001	1.466	2.134
2010***	1.805	0.177	<0.001	1.489	2.189
Age	0.994	0.003	0.099	0.987	1.001
Marital-status (Reference = Single)	1.429	0.318	0.108	0.924	2.211
Education (Reference = None)					
Primary***	1.444	0.109	<0.001	1.245	1.675
Secondary***	2.279	0.267	<0.001	1.811	2.867
Above secondary***	11.190	6.218	<0.001	3.765	33.255
Unemployed (Reference = Employed)	0.914	0.067	0.225	0.790	1.056
Religion (Reference = Christian)					
Muslim	1.000	0.075	0.998	0.863	1.158
Traditionalist ***	0.686	0.061	<0.001	0.576	0.818
Others	0.848	0.225	0.536	0.503	1.429
Decision-maker (Reference = Self)					
Joint	0.958	0.104	0.697	0.773	1.186
Husband/someone else	0.945	0.087	0.543	0.789	1.132
Wealth-index	1.037	0.026	0.151	0.986	1.091
Distance is a big problem (Reference = Small Problem)**	0.850	0.040	0.001	0.774	0.934
Rural (Reference = Urban)***	0.746	0.051	<0.001	0.651	0.855
Household-size	1.003	0.004	0.464	0.993	1.013
Smoker (Reference = Non-Smoker)	0.935	0.106	0.555	0.748	1.168
Region (Reference = Ouagadougou)					
Boucle du mouhoun**	0.706	0.086	0.004	0.556	0.897
Centre	1.206	0.156	0.148	0.935	1.556
Centre-Sud***	2.035	0.226	<0.001	1.636	2.531
Plateau central	0.876	0.099	0.245	0.702	1.094
Centre-Est	0.860	0.099	0.196	0.685	1.080
Centre-Nord	1.194	0.135	0.117	0.956	1.493
Centre-Ouest	1.213	0.130	0.072	0.982	1.498
Est	0.875	0.101	0.248	0.697	1.097
Nord**	0.688	0.081	0.002	0.546	0.867
Cascades*	1.309	0.147	0.017	1.050	1.632
Hauts Bassins***	0.359	0.047	<0.001	0.276	0.466
Sahel	0.931	0.114	0.562	0.732	1.184
Sud-Ouest*	0.678	0.128	0.041	0.467	0.984
Total Sample Size					**12,933**

* p < 0.05; ** p < 0.01; *** p < 0.001

Utilization of Skilled Birth Attendants

Table 12 presents result from a multivariable logistic regression model examining factors associated with delivering with the assistance of a skilled birth attendant in Burkina Faso. Compared to 2001, in 2003 women were less likely to have a skilled attendant present during delivery (OR=0.676, 95% CI [0.564 - 0.810]). However, in 2008 (OR=7.563 - 95% CI [6.292 - 9.091]), 2009 (OR=8.382 - 95% CI [6.979, 10.068]), and 2010 (OR=8.784, 95% CI [7.267 - 10.605]), the odds of having a skilled attendant at delivery increased.

Other variables found to be positively associated with the likelihood of assisted birth by skilled attendant were: completing primary (OR=2.040, 95% CI [1.707 - 2.439]), and secondary (OR=2.526, 95% CI [1.828 - 3.492]) versus having no education; being of a Muslim (OR=1.826, 95% CI [1.580 - 2.110]); and living in the Centre-Sud (OR=1.603 - 95% CI [1.262 - 2.036]), Centre-Nord (OR=1.268, 95% CI [1.012 - 1.588]), and Cascades (OR=1.309, 95% CI [1.048 - 1.635]) regions.

Variables found to be negatively associated with the likelihood of assisted delivery by skilled attendant were: age (OR=0.965, 95% CI [0.958 - 0.971]); being unemployed (OR=0.746, 95% CI [0.644 - 0.864]); identifying with Traditionalism (OR=0.523, 95% CI [0.443 - 0.617]); having someone else be the decision maker (OR=0.682, 95% CI [0.568 - 0.820]); reporting that distance to the health facility is a big problem (OR=0.441, 95% CI [0.401 - 0.485]); living in a rural area (OR=0.258, 95% CI [0.222 - 0.300]); and smoking (OR=0.781, 95% CI [0.629 - 0.969]). Regional variations were also identified. Compared with women delivering in the Ouagadougou, women from the following regions were less likely to deliver with the assistance of a skilled birth attendant: Centre-Est (OR=0.666, 95% CI [0.524 - 0.845]); Centre-Ouest (OR=0.699, 95% CI [0.551 - 0.862]); Est (OR=0.673, 95% CI [0.535 - 0.845]); Nord

(OR=0.539, 95% CI [0.433 - 0.671]); Hauts Bassins (OR=0.450, 95% CI [0.356 - 0.570]); Sahel (OR=0.358, 95% CI [0.282 - 0.453]).

Table 12: Logistic Regression - Factors Associated with Assistance of Skilled Attendant – Burkina Faso

Assistance of Skilled Attendant	**Odds Ratio**	**Robust Standard Error**	**P > [Z]**	**95% Confidence Interval**	
Birth year (Reference = 2001)					
2002	1.002	0.086	0.974	0.846	1.188
2003***	0.676	0.062	<0.001	0.564	0.811
2008***	7.563	0.710	<0.001	6.292	9.091
2009***	8.382	0.783	<0.001	6.979	10.068
2010***	8.784	0.844	<0.001	7.276	10.605
Age	0.965	0.003	<0.001	0.958	0.971
Marital-status (Reference = Single)**	0.616	0.110	0.007	0.433	0.876
Education (Reference = None)					
Primary***	2.040	0.185	<0.001	1.707	2.439
Secondary***	2.526	0.417	<0.001	1.828	3.492
Above secondary	2.290	1.269	0.135	0.772	6.786
Unemployed (Reference = Employed)***	0.746	0.055	<0.001	0.644	0.864
Religion (Reference = Christian)					
Muslim***	1.826	0.134	<0.001	1.580	2.110
Traditionalist***	0.523	0.044	<0.001	0.443	0.617
Others	0.945	0.227	0.816	0.590	1.515
Decision-maker (Reference = Self)					
Joint	0.837	0.093	0.112	0.672	1.041
Husband/someone else***	0.682	0.063	<0.001	0.568	0.820
Wealth-index	0.996	0.030	0.898	0.937	1.058
Distance is problem (Reference = Small Problem)***	0.441	0.021	<0.001	0.401	0.485
Rural (Reference = Urban)***	0.258	0.019	<0.001	0.222	0.300
Household-size	1.004	0.005	0.414	0.994	1.014
Smoker (Reference = Non-Smoker)*	0.781	0.086	0.025	0.629	0.969
Region (Reference = Ouagadougou)					
Boucle du Mouhoun	1.016	0.120	0.892	0.805	0.282
Centre	1.031	0.151	0.834	0.773	1.375
Centre-Sud***	1.603	0.195	<0.001	1.262	2.036
Plateau central	0.994	0.114	0.961	0.793	1.246
Centre-Est***	0.666	0.080	0.001	0.524	0.845
Centre-Nord*	1.268	0.145	0.039	1.012	1.588
Centre-Ouest**	0.689	0.078	0.001	0.551	0.862
Est**	0.673	0.078	0.001	0.535	0.845
Nord***	0.539	0.060	<0.001	0.433	0.671
Cascades*	1.309	0.148	0.017	1.048	1.635
Hauts Bassins***	0.450	0.053	<0.001	0.356	0.570
Sahel***	0.358	0.043	<0.001	0.282	0.453
Sud-Ouest	1.048	0.1668	0.764	0.768	1.432
Total sample size					**13,746**

* p<0.05; **p<0.01; ***p<0.001

Postnatal Care Utilization

Table 13 presents result from a multivariable logistic regression model examining factors associated with the receipt of postnatal check-up the following birth in Burkina Faso. Compared to 2001, in 2003 women were less likely to receive a postnatal check-up (OR=0.551, 95% CI [0.429 – 0.707]). However, between 2008 and 2010, the odds of receiving a postnatal check-up increased to up to 13 times, compared to the 2001 level.

Other variables found to be positively associated with the likelihood of receiving a postnatal check-up were: completing primary education (OR=1.456 95% CI [1.151 – 1.840]); and secondary education (OR=1.933 – 95% CI [1.124 – 3.324]); living in the Center (OR=2.543, 95% CI [1.665 – 3.885]), Centre-Sud (OR=2.143, 95% CI [1.585 – 2.898]), Plateau Central (OR=2.812, 95% CI [2.104 – 3.760]), Centre-Nord (OR=2.204, 95% CI [1.648 – 2.947]), Centre-Ouest (OR=1.972, 95% CI [1.479 – 2.630]), and Cascade (OR=2.186 – 95% CI [1.624, 2.943]) regions (as compared to Ouagadougou).

Variables found to be negatively associated with the likelihood of receiving a postnatal check-up were: being unemployed (OR=0.498, 95% CI [0.407 – 0.588]), identifying as traditionalist (OR=0.521, 95% CI [0.432 – 0.630]) or identifying with a religion other than Christianity, Traditionalism or Islam (OR=0.484, 95% CI [0.279 – 0.840]); having the husband/ someone else be the decision maker (OR=0.749, 95% CI [0.584 – 0.962]); reporting that distance to the health facility is a problem (OR=0.687, 95% CI [0.610 – 0.773]); living in a rural area (OR=0.412, 95% CI [0.326 – 0.521]), smoking (OR=0.713, 95% CI [0.534 – 0.951]); living in the Sahel region (OR=0.399, 95% CI [0.300 – 0.532]).

Table 13: Logistic Regression – Factors Associated with completion of Postnatal Check – Burkina Faso

Receipt of Postnatal Check-Up	Odds Ratio	Robust Standard Error	P > [z]	95% Confidence Interval	
Birth year (reference 2001)					
2002	0.896	0.103	0.345	0.714	1.125
2003***	0.551	0.070	<0.001	0.429	0.707
2008***	11.704	1.399	<0.001	9.259	14.795
2009***	12.237	1.434	<0.001	9.725	15.398
2010***	13.285	1.595	<0.001	10.499	16.811
Age	0.998	0.004	0.662	0.989	1.006
Marital-status (Reference = Single)	0.855	0.270	0.622	0.460	1.590
Education (Reference = None)					
Primary**	1.456	0.174	0.002	1.151	1.840
Secondary*	1.933	0.534	0.017	1.124	3.324
More than secondary	0.444	0.298	0.228	0.119	1.659
Unemployed (Reference = Employed)***	0.489	0.046	<0.001	0.407	0.588
Religion (Reference = Christian)					
Muslim	0.988	0.088	0.900	0.829	1.178
Traditionalist***	0.521	0.050	<0.001	0.432	0.630
Others*	0.484	0.136	0.010	0.279	0.840
Decision-maker (Reference = Self)					
Joint	1.003	0.147	0.983	0.752	1.337
Husband/someone else*	0.749	0.095	0.024	0.584	0.962
Wealth-index	0.979	0.042	0.624	0.900	1.065
Distance is a big problem (Reference = Small Problem)***	0.687	0.041	<0.001	0.610	0.773
Rural (Reference = Urban)***	0.412	0.049	<0.001	0.326	0.521
Household-size	0.989	0.006	0.102	0.976	1.002
Smoker (Reference = Non-Smoker)*	0.713	0.104	0.022	0.534	0.951
Region(Reference = Ouagadougou)					
Boucle du Mouhoun	0.990	0.147	0.949	0.740	1.325
Centre***	2.543	0.549	<0.001	1.665	3.885
Centre-Sud***	2.143	0.329	<0.001	1.585	2.898
Plateau central***	2.812	0.416	<0.001	2.104	3.760
Centre-Est	1.204	0.181	0.218	0.895	1.618
Centre-Nord***	2.204	0.326	<0.001	1.648	2.947
Centre-Ouest***	1.972	0.289	<0.001	1.479	2.630
Est	1.044	0.150	0.760	0.788	1.385
Nord	1.213	0.172	0.173	0.918	1.604
Cascades***	2.186	0.331	<0.001	1.624	2.943
Hauts Bassins	1.284	0.187	0.087	0.964	1.709
Sahel***	0.399	0.058	<0.001	0.299	0.531
Sud-Ouest	0.838	0.181	0.415	0.548	1.281
Total Sample Size					**10,719**

* p<0.05; **p<0.01; ***p<0.001

Infant Birth Outcomes - Neonatal Mortality

Due to significant missing data and lack of significant variation in the infant outcome variables, only bivariate analyses were completed to assess trends as well as the relationship between maternal healthcare utilization and birth outcomes. In an unadjusted analysis, factors associated with neonatal mortality were: years 2002 (OR=1.843, 95% CI [1.090 – 3.116]) and 2003 (OR=2.126, 95% CI [1.264 – 3.575]), compared to 2001 rates. Between 2008 and 2010, there was no statistically significant improvement in neonatal mortality, compared to 2001.

In the unadjusted analysis, factors negatively (protective factors against neonatal mortality) associated with neonatal mortality were: having the assistance of a skilled attendant at delivery (OR=0.707, 95% CI [0.536 – 0.932]) and receiving a postnatal check-up (OR=0.527, 95% CI [0.384 – 0.723]) (Table 14).

Table 14: Logistic Regression – Factors Associated with Neonatal Mortality – Burkina Faso

Neonatal Mortality	**Unadjusted Odds Ratio**	**Robust Standard Error**	**P > |z|**	**95% Confidence Interval**	
Birth year					
2002*	1.843	0.493	0.022	1.090	3.116
2003**	2.126	0.563	0.004	1.264	3.575
2008	0.698	0.216	0.248	0.380	1.284
2009	1.494	0.385	0.119	0.901	2.477
2010	1.256	0.337	0.395	0.741	2.128
Antenatal Care	0.784	0.142	0.181	0.549	1.119
Skilled attendant*	0.707	0.099	0.014	0.536	0.932
Postnatal check***	0.527	0.084	<0.001	0.384	0.723
Total Sample Size					**14,159**

*p<0.05; **p<0.01; ***p<0.001

Infant Birth Outcomes – Infant Mortality

In an unadjusted analysis, the year variable was positively associated with infant mortality. Specifically, the odds of a child dying before the age of one was higher in 2002

compared with 2001 (OR=1.778, 95% CI [1.303 – 2.424]). Between 2008 and 2010, there was no statistically significant improvement in infant mortality, compared to 2001.

In an unadjusted analysis, factors negatively (protective factors against infant mortality) associated with infant mortality were: having the assistance of a skilled attendant at delivery (OR=0.649, 95% CI [0.545 – 0.772]) and receiving a postnatal check-up (OR=0.512, 95% CI [0.419 – 0.626]) (Table 15).

Table 15: Logistic Regression – Factors Associated with Infant Mortality – Burkina Faso

Infant Mortality	**Unadjusted Odds Ratio**	**Robust Standard Error**	**P > |z|**	**95% Confidence Interval**	
Birth year					
2002***	1.778	0.281	<0.001	1.303	2.424
2003	1.375	0.238	0.066	0.979	1.931
2008	0.820	0.144	0.260	0.580	1.157
2009	1.236	0.195	0.179	0.907	1.684
2010	0.866	0.152	0.417	0.614	1.223
Antenatal Care	0.843	0.091	0.114	0.682	1.042
Skilled attendant***	0.649	0.057	<0.001	0.545	0.772
Postnatal check***	0.512	0.052	<0.001	0.419	0.626
Total Sample Size					**14,159**

*p<0.05; **p<0.01; ***p<0.001

Multivariable Analysis – Ghana

Antenatal Care Utilization

Table 16 presents result from a multivariable logistic regression model examining factors associated with the completion of antenatal visits in Ghana. Compared to 2001, in 2003 women in Ghana were less likely to complete four or more antenatal visits (OR=0.654, 95% CI [0.484 – 0.883]). However, between 2010 and 2013, the odds of completing four or more antenatal visits increased by up to 200%, compared to 2001. More precisely, the likelihood of completing four or

more antenatal care visits increased greatly with insurance. In comparison to 2001 levels, the odds ratio for the uninsured population were 2.785, (95% CI [1.530 – 5.069]), 3.252, (95% CI [1.987 – 5.322]), 2.832, (95% CI [1.836 – 4.370]), and 3.351, (95% CI [2.261 – 4.964]) for 2010, 2011, 2012 and 2013, respectively. Interestingly, except for the year 2010 when uninsured mothers were two times more likely to attend at least four antenatal visits compared to 2001 levels (OR=2.312, 95% CI [1.134 – 4.715]), no statistically significant increase in antenatal utilization was observed in subsequent years within the uninsured population.

Other factors positively associated with the likelihood of completing four or more antenatal care visits were: completing secondary education (OR=2.251, 95% CI [1.726 – 2.936] and above secondary education (OR= 24.112, 95% CI [3.179 – 182.887] versus having no formal education; having a joint decision making process with spouse (OR=1.284, 95% CI [1.002 – 1.644]); and living in the Ashanti (OR=1.924, 95% CI [1.194 – 3.101]), Brong Ahafo (OR=2.028, 95% CI [1.238 – 3.322]), Upper West (OR=3.229, 95% CI [1.917 – 5.441]), and Upper East (OR=2.342, 95% CI [1.388 – 3.951]) regions (compared to the Greater Accra Region).

Variables found to be negatively associated with the likelihood of completing four or more antenatal visits were: being unemployed (OR=0.660, 95% CI [0.498 – 0.876]); identifying as a religion other than Christianity, Traditionalism or Islam (OR= 0.499, 95% CI [0.358 – 0.696]); reporting that distance to health facility is a problem (OR=0.729, 95% CI [0.602 – 0.882]); living in a rural area (OR=0.363, 95% CI [0.277 – 0.475]); household size (OR=0.961, 95% CI [0.931 – 0.992]; and being a smoker (OR=0.27, 95% CI [0.110 – 0.683].

Table 16: Logistic Regression – Factors Associated with Completion of Antenatal Care Visit – Ghana

Antenatal Care Visits	Odds Ratio	Robust Standard Error	P > |z|	95% Confidence Interval	
Birth year & Insurance (reference 2001[1])					
[1]2002– Uninsured	0.869	0.122	0.318	0.660	1.144
[1]2003– Uninsured**	0.654	0.100	0.006	0.484	0.883
2010 – Uninsured*	2.312	0.840	0.021	1.134	4.715
2010 – Insured***	2.785	0.850	<0.001	1.530	5.069
2011 – Uninsured	1.635	0.474	0.090	0.926	2.886
2011– Insured***	3.252	0.817	<0.001	1.987	5.322
2012– Uninsured	1.266	0.307	0.331	0.786	2.038
2012– Insured***	2.832	0.626	<0.001	1.836	4.370
2013– Uninsured	0.985	0.219	0.948	0.637	1.523
2013– Insured***	3.351	0.672	<0.001	2.261	4.964
Age	1.013	0.007	0.081	0.998	1.028
Marital-status (Reference = Single)	1.312	0.278	0.201	0.865	1.990
Education (Reference = None)					
Primary	1.238	0.164	0.106	0.955	1.606
Secondary***	2.251	0.305	<0.001	1.726	2.936
Above secondary**	24.112	24.926	0.002	3.179	182.887
Unemployed (Reference = Employed)**	0.660	0.094	0.004	0.498	0.876
Religion (Reference = Christian)					
Muslim	1.215	0.152	0.121	0.949	1.555
Traditionalist	1.180	0.160	0.223	0.904	1.540
Others***	0.499	0.084	<0.001	0.358	0.696
Decision-maker (Reference = Self)					
Joint*	1.284	0.161	0.047	1.002	1.644
Husband/someone else	1.064	0.124	0.593	0.845	1.340
Wealth-index	1.136	0.090	0.108	0.972	1.327
Distance is a big problem (Reference = Small Problem)**	0.729	0.070	0.001	0.602	0.882
Rural (Reference = Urban)***	0.363	0.049	<0.001	0.277	0.475
Household-size*	0.961	0.015	0.016	0.931	0.992
Smoker (Reference = Non-Smoker)**	0.275	0.127	0.005	0.110	0.683
Region (Reference: Accra)					
Western	1.053	0.268	0.838	0.639	1.735
Central	1.604	0.421	0.072	0.958	2.684
Volta	0.939	0.244	0.811	0.564	1.565
Eastern	0.758	0.187	0.262	0.467	1.230
Ashanti**	1.924	0.468	0.007	1.194	3.101
Brong Ahafo**	2.028	0.510	0.005	1.238	3.322
Northern	1.285	0.311	0.301	0.799	2.066
Upper West***	3.229	0.859	<0.001	1.917	5.441
Upper East***	2.342	0.625	<0.001	1.388	3.951
Total sample size					**4,629**

[1]All mothers were uninsured in 2001-2003 as the NHIS passed in 2005. *p<0.05; **p<0.01; ***p<0.001

Utilization of Skilled Birth Attendants

Table 17 presents result from a multivariable logistic regression model examining factors associated with delivering with the assistance of a skilled birth attendant in Ghana. Compared to 2001, from 2010 to 2013, women were more likely to have a skilled attendant present during delivery. This was true for both the insured and uninsured populations. However, for every year between 2010 and 2013, the magnitude of the association was greater for the insured population compared to the uninsured population (for example, in 2013 the OR for the insured population was 4.356 (95% CI [3.024 – 6.277]) vs. 1.783 (95% CI [1.189 – 2.672]), for the uninsured population).

Other variables found to be positively associated with the likelihood of assisted birth by skilled attendant were: completing secondary (OR=2.127, 95% CI [1.698 – 2.663]), and above secondary education (OR=18.040, 95% CI [3.498 – 93.029]) versus having no education; joint decision-making (OR=1.255, 95% CI [1.010 – 1.558]) and; being wealthy (OR=1.297, 95% CI [1.141 – 1.475]).

Variables found to be negatively associated with the likelihood of assisted delivery by skilled attendant were: identifying as a religion other than Christianity, Traditionalism or Islam (OR=0.450, 95% CI [0.318 – 0.637]); reporting that distance to health care facility is a big problem (OR=0.671, 95% CI [0.564 – 0.800]); living in a rural area (OR=0.216, 95% CI [0.173 – 0.269]); the size of the household (OR=0.958, 95% CI [0.926 – 0.992]); living in the Western (OR=0.504, 95% CI [0.317 – 0.801]), the Volta (OR=0.659, 95% CI [0.414 – 1.048]), the Eastern (OR=0.510, 95% CI [0.321 – 0.808]), the Northern (OR=0.230, 95% CI [0.145 – 0.365]), and the Upper East (OR=0.553, 95% CI [0.335 – 0.911]) regions (compared to the Greater Accra Region).

Table 17: Logistic Regression – Factors Associated with assistance of Skilled Attendant – Ghana

Assistance of Skilled Attendant	**Odds Ratio**	**Robust Standard Error**	**P > |z|**	**95% Confidence Interval**	
Birth year & Insurance (reference 2001[1])					
[1]2002– Uninsured	0.963	0.140	0.801	0.724	1.282
[1]2003– Uninsured	0.773	0.126	0.115	0.561	1.064
2010 – Uninsured	1.663	0.433	0.051	0.998	2.773
2010 – Insured***	3.152	0.826	<0.001	1.885	5.269
2011 – Uninsured*	1.761	0.477	0.037	1.035	2.996
2011– Insured***	3.038	0.692	<0.001	1.944	4.748
2012– Uninsured***	2.214	0.441	<0.001	1.497	3.274
2012– Insured***	3.819	0.697	<0.001	2.670	5.463
2013– Uninsured**	1.783	0.368	0.005	1.189	2.672
2013– Insured***	4.356	0.811	<0.001	3.024	6.277
Age	1.011	0.007	0.123	0.996	1.026
Marital-status (Reference = Single)	1.059	0.238	0.796	0.681	1.647
Education (Reference = None)					
Primary	0.988	0.115	0.919	0.786	1.241
Secondary***	2.127	0.244	<0.001	1.698	2.663
Above secondary***	18.040	15.098	0.001	3.498	93.029
Unemployed (Reference = employed)	1.127	0.170	0.426	0.838	1.515
Religion (Reference = Christian)					
Muslim	0.836	0.096	0.123	0.666	1.049
Traditionalist	0.919	0.111	0.488	0.725	1.166
Others***	0.450	0.079	<0.001	0.318	0.637
Decision-maker (Reference= Self)					
Joint*	1.255	0.138	0.040	1.010	1.558
Husband/someone else	1.003	0.118	0.976	0.796	1.263
Wealth-index ***	1.297	0.084	<0.001	1.141	1.475
Distance is problem (Reference = Small Problem)***	0.671	0.059	<0.001	0.564	0.800
Rural (Reference = Urban)***	0.216	0.024	<0.001	0.173	0.269
Household-size*	0.958	0.016	0.017	0.926	0.992
Smoker (Reference = Non-Smoker)	0.643	0.362	0.433	0.213	1.940
Region (reference =Accra)					
Western**	0.504	0.119	0.004	0.317	0.801
Central	0.640	0.160	0.076	0.392	1.046
Volta	0.659	0.156	0.079	0.414	1.048
Eastern**	0.510	0.119	0.004	0.321	0.808
Ashanti	0.996	0.225	0.988	0.640	1.551
Brong Ahafo	0.772	0.173	0.252	0.497	1.201
Northern***	0.230	0.054	<0.001	0.145	0.365
Upper West	1.298	0.307	0.271	0.815	2.065
Upper East*	0.553	0.140	0.020	0.335	0.911
Total sample size					**4,629**

[1]All mothers were uninsured in 2001-2003 as the NHIS passed in 2005. *p<0.05; **p<0.01; ***p<0.001

Postnatal Care Utilization

Table 18 presents result from a multivariable logistic regression model examining factors associated with the receipt of postnatal check-up the following birth in Ghana. Compared to 2001, between 2010 and 2013 women were more likely to receive a postnatal check-up: This was true for both the insured and uninsured populations. However, as with the utilization of a skilled birth attendant, for every year between 2010 and 2013, the magnitude of the association was greater for the insured population compared to the uninsured population (for example, in 2013 the OR for the insured population was 3.917 95% CI [2.586 – 5.933]) vs. 2.788 (95% CI [1.808 – 4.300), for the uninsured population.

Other variables found to be positively associated with the likelihood of receiving a postnatal check-up were: completing secondary education (OR=1.411, 95% CI [1.074 – 1.854]) and making joint decisions with a partner (OR=1.484, 95% CI [1.168 – 1.885]).

Variables found to be negatively associated with the likelihood of receiving a postnatal check-up were: identifying with a religion other than Christianity, Traditionalism or Islam (OR=0.394, 95% CI [0.279 – 0.556]); reporting that distance to the health facility is a problem (OR=0.723, 95% CI [0.594 – 0.880]); living in a rural area (OR=0.526, 95% CI [0.401 – 0.691]); size of the household (OR=0.952, 95% CI [0.917 – 0.989]); smoking (OR=0.231, 95% CI [0.082 – 0.653]); and living in the Volta (OR=0.371, 95% CI [0.220 – 0.626]), Eastern (OR=0.382, 95% CI [0.225 – 0.648]), Northern (OR=0.405, 95% CI [0.240 – 0.682]), and Upper East (OR=0.350, 95% CI [0.200 – 0.615]) regions (compared to the Greater Accra Region).

Table 18: Logistic Regression – Factors Associated with completion of Postnatal Check – Ghana

Receipt Postnatal check	**Odds Ratio**	**Robust Standard Error**	**P > |z|**	**95% Confidence Interval**	
Birth year & Insurance (reference 2001[1])					
[1]2002– Uninsured	0.830	0.141	0.278	0.594	1.161
[1]2003– Uninsured	0.761	0.136	0.128	0.536	1.081
2010 – Uninsured*	1.820	0.530	0.040	1.028	3.222
2010 – Insured***	4.368	1.279	<0.001	2.460	7.757
2011 – Uninsured***	2.994	0.781	<0.001	1.795	4.993
2011– Insured***	4.646	1.086	<0.001	2.938	7.347
2012– Uninsured***	2.730	0.663	<0.001	1.696	4.395
2012– Insured***	4.236	0.861	<0.001	2.844	6.310
2013– Uninsured***	2.788	0.616	<0.001	1.808	4.300
2013– Insured***	3.917	0.829	<0.001	2.586	5.933
Age	1.010	0.008	0.176	0.995	1.026
Marital-status (Reference = Single)	0.796	0.216	0.403	0.466	1.358
Education (Reference = None)					
Primary	1.008	0.136	0.947	0.773	1.315
Secondary*	1.411	0.196	0.013	1.074	1.854
More than secondary	1.539	0.737	0.368	0.602	3.935
Unemployed (Reference =	1.162	0.212	0.409	0.812	1.663
Religion (Reference = Christian)					
Muslim	1.031	0.136	0.816	0.795	1.336
Traditionalist	0.889	0.116	0.371	0.688	1.149
Others***	0.394	0.069	<0.001	0.279	0.556
Decision-maker (Reference = Self)					
Joint**	1.484	0.181	0.001	1.168	1.885
Husband/someone else	1.071	0.140	0.596	0.829	1.384
Wealth-index	1.118	0.079	0.118	0.971	1.286
Distance is a big problem (Reference = Small Problem)**	0.723	0.072	0.001	0.594	0.880
Rural (Reference = Urban)***	0.526	0.073	<0.001	0.401	0.691
Household-size*	0.952	0.018	0.012	0.917	0.989
Smoker (Reference = Non-Smoker)**	0.231	0.122	0.006	0.082	0.653
Region (Accra)					
Western	0.766	0.216	0.346	0.441	1.332
Central	1.100	0.376	0.780	0.562	2.150
Volta***	0.371	0.098	<0.001	0.220	0.626
Eastern***	0.382	0.103	<0.001	0.225	0.648
Ashanti	0.676	0.185	0.153	0.395	1.156
Brong Ahafo*	0.508	0.137	0.012	0.299	0.862
Northern**	0.405	0.107	0.001	0.240	0.682
Upper West	0.766	0.208	0.328	0.449	1.306
Upper East***	0.350	0.100	<0.001	0.200	0.615
Total Sample Size					**3,830**

[1]All mothers were uninsured in 2001-2003 as the NHIS passed in 2005. *p<0.05; **p<0.01; ***p<0.001

Infant Birth Outcomes – Neonatal Mortality

As stated earlier, due to significant missing data and lack of variation in the infant outcome variables, only bivariate analyses were completed to assess trends as well as the relationship between maternal healthcare utilization and birth outcomes. In an unadjusted analysis, the only factor associated with neonatal mortality was the year and insurance variable. In 2003, the odds of a child dying within a month of birth were four times greater than 2001 (OR=4.398, 95% CI [1.983 – 9.753]). In 2011, however, the odds of a child dying within a month of birth, among the insured population was 76% lower than in 2001 (OR=0.239, 95% CI [0.062 – 0.919]). None of the maternal health utilization factors assessed were associated with neonatal mortality (Table 19).

Table 19: Logistic Regression – Factors Associated with Neonatal Mortality – Ghana

Neonatal mortality	**Unadjusted Odds Ratio**	**Robust Standard Error**	**P > [z]**	**95% Confidence Interval**	
Birth year & Insurance (Reference: 2001[1])					
[1]2002– Uninsured	1.371	0.614	0.481	0.570	3.299
[1]2003– Uninsured***	4.398	1.787	<0.001	1.983	9.753
2010 – Uninsured	0.178	0.190	0.106	0.022	1.440
2010 – Insured	0.980	0.631	0.976	0.277	3.462
2011 – Uninsured	0.363	0.315	0.243	0.066	1.988
2011– Insured*	0.239	0.164	0.037	0.062	0.919
2012– Uninsured	1.064	0.771	0.931	0.257	4.404
2012– Insured	0.825	0.457	0.730	0.278	2.446
2013– Uninsured	1.026	0.574	0.963	0.342	3.077
2013– Insured	0.998	0.506	0.997	0.369	2.697
Antenatal Care	1.108	0.329	0.729	0.619	1.983
Skilled attendant	1.004	0.234	0.985	0.635	1.587
Postnatal check	1.160	0.360	0.631	0.631	2.132
Total Sample Size					**5,160**

[1]All mothers were uninsured in 2001-2003 as the NHIS passed in 2005. *p<0.05; **p<0.01; ***p<0.001

Infant Birth Outcomes – Infant Mortality

In an unadjusted analysis, the year variable was positively associated with infant mortality. Specifically, the odds of a child dying before the age of one was higher in 2003 compared with 2001 (OR=2.158, 95% CI [1.162 – 4.004]).

In 2010 and 2011, the odds of a child dying before the first anniversary decreased compared to 2001 among the uninsured and insured populations, respectively (uninsured OR=0.077, 95% CI [0.010 – 0.593]) and (insured OR=0.287, 95% CI [0.118 – 0.697]). None of the maternal health utilization factors assessed were associated with infant mortality (Table 20).

Table 20: Logistic Regression - Factors Associated with Infant Mortality - Ghana

Infant mortality	**Unadjusted Odds Ratio**	**Robust Standard Error**	**P > |z|**	**95% Confidence Interval**	
Birth year & Insurance (Reference: 2001)[1]					
[1]2002– Uninsured	1.287	0.407	0.426	0.691	2.395
[1]2003– Uninsured*	2.158	0.680	0.015	1.162	4.004
2010 – Uninsured*	0.077	0.080	0.014	0.010	0.593
2010 – Insured	0.704	0.352	0.483	0.264	1.875
2011 – Uninsured	0.351	0.203	0.071	0.113	1.093
2011– Insured**	0.287	0.130	0.006	0.118	0.697
2012– Uninsured	1.434	0.591	0.382	0.639	3.219
2012– Insured	0.701	0.277	0.370	0.323	1.522
2013– Uninsured	0.661	0.281	0.331	0.287	1.521
2013– Insured	0.501	0.206	0.093	0.223	1.122
Antenatal Care	0.874	0.184	0.525	0.579	1.321
Skilled Attendant	0.924	0.165	0.662	0.651	1.312
Postnatal Check	0.869	0.195	0.534	0.559	1.351
Total Sample Size					**5,160**

[1]All mothers were uninsured in 2001-2003 as the NHIS passed in 2005. *p<0.05; **p<0.01; ***p<0.001

Table 21: Summary of Main Results for Study Hypotheses

Hypothesis	**Supported?**
H1: All things being equal, women are more likely to use prenatal care services after the free maternal care policy compared to before the free maternal care policy.	Yes
H2: All things being equal, pregnant women are more likely to use prenatal care services after the EmONC compared to before the EmONC.	Yes
H3: All things being equal, women are more likely to use skilled birth attendants during labor and delivery after the free maternal care policy compared to before the free maternal care policy.	Yes
H4: All things being equal, women are more likely to use skilled birth attendants during labor and delivery after the EmONC compared to before the EmONC.	Yes
H5: All things being equal, women are likely to have post-natal check-up visits after the free maternal care policy, compared to before the free maternal care policy.	Yes
H6: All things being equal, women are likely to have post-natal check-up visits after the EmONC, compared to before the EmONC.	Yes
H7: All things being equal, children are less likely to die before the age of 1 month after the free maternal care policy compared to before the free maternal care law.	No
H8: All things being equal, children are less likely to die before the age of 1 month after the EmONC compared to before the EmONC.	No
H8: All things being equal, infants are less likely to die after the free maternal care policy compared to before the free maternal care law.	No
H10: All things being equal, infants are less likely to die after the EmONC compared to before the EmONC.	No

CHAPTER 6: DISCUSSION

Introduction

Reducing maternal and child mortality in developing country are two primary goals of the substantial development agenda set by the WHO. Improving access to key health care services to women and children is one proven way to improve health outcomes for the mother and the child. Therefore, many countries including Burkina Faso and Ghana have established policies to facilitate access to care. Ghana launched a free maternal care policy in 2008 as part of it national insurance law and Burkina Faso put in place a policy for emergency obstetric care in 2006 providing a partial reimbursement for uncomplicated deliveries.

After years of implementation, few studies have evaluated the effect of these two policies on maternal care utilization and infant outcome. Therefore, the primary aim of this study was to assess the impact that Ghana's NHIS free maternal care policy and Burkina Faso's national subsidy for deliveries and emergency obstetric and neonatal care (EmONC) have had on health services utilization and infant health outcomes. Using the 2003-2014 DHS cross-sectional household survey data, a before and after the evaluation was performed to determine service utilization as impacted by the policies. The year 2003 was selected as a baseline for both country and 2010 and 2014 as end line for Burkina Faso and Ghana, respectively. A dual evaluation of the impact each policy had on antenatal care visit, assisted delivery, postnatal check-ups, neonatal and infant mortality was completed.

The Effect of the Policies

After adjusting for relevant predisposing, need and enabling factors that may have influenced health services utilization, the findings from the study show an association between

both policies and women's access to antenatal care, being assisted by skilled attendants, and receiving a postnatal check-up. The policies may have had a positive effect on increasing the probability of completing at least four antenatal care visits, increasing the likelihood of being assisted during labor or delivery by a skilled attendant, and the probability of receiving a postnatal check-up visit. These results are consistent with what has been previously reported in the literature for other countries (Afulani, 2015; De Allegri et al., 2012; Gnawali et al., 2009; Moss, Darmstadt, Marsh, Black, & Santosham, 2002).

In Ghana, under the free maternal health care initiative of 2008, subsidized health insurance is provided to pregnant women, which offers them access to maternal and child health services. However, to take advantage of these comprehensive maternal benefits mothers have to be enrolled in the NHIS (which was passed in 2005). Thus, in this study, the direct effect of the Ghana free maternal health care initiative was assessed by the effect it had on the utilization of services among the insured population, relative to the uninsured population. The findings demonstrate an increase in the use of the skilled birth attendants and postnatal care in both the insured and uninsured populations, following the implementation of the policy (i.e. 2010-2013 compared to 2001-2003), with the effect size being greater in magnitude for the insured population. This finding corroborates the findings from a previous study in Ghana that found that post policy, the number of facility-based or assisted delivery increased among women in rural areas (HERA and Health Partners Ghana, 2013). The finding of an increase utilization of perinatal and postnatal services among the uninsured suggests the potential existence of a "spill-over" effect of the policy on the utilization of these health services, a finding that deserves further exploration. Contrary to Gobah & Liang (2011) who found no positive correlation between the NHIS and antenatal care, an increase in the utilization of antenatal health care

services was only observed for the insured population and not the uninsured population, following the implementation of the policy.

In Burkina Faso, statistically significant increases in the likelihood of maternal health services utilization were observed for antenatal services, perinatal and postnatal services. The effect magnitude was found to be largest for the use of postnatal care, where the odds of the utilization increased up to approximately 200% in the post-policy era (2008-2010) compared to the pre-policy era (2001-2003). The effect magnitude was the least for antenatal services. These findings are logical, given that the EmONC law focuses on increasing the coverage of facility-based deliveries and caesarean sections.

In general, the study's findings showed a declining trend in neonatal and infant mortality in both countries, though not statistically significant. In Burkina Faso, being assisted by a skilled attendant at labor or delivery and receiving a postnatal check-up were associated with a reduced likelihood of neonatal and infant mortality but this association did not hold true for Ghana. The findings in Burkina Faso are consistent with other studies that found the receipt of postnatal service to be positively associated with improved neonatal health outcomes (Du Preez, 2010; Tinker & Ransom, 2012). Other studies have also reported a correlation between being assisted birth by skilled professionals and increased neonatal survival rate (Tilaley et al., 2008; Lawn et al., 2009; Mrisho et al., 2011).

While variables such as completing a secondary education, having the decision-making power, being a Christian and living in an urban area were found to influence health seeking behavior positively, other factors like distance to health facility, traditional religious beliefs, residing in a rural area were identified as barriers to maternal care utilization. This is in

agreement with what has been previously reported in the literature (Gabrysch & Campbell, 2009; Simkhada, Teijlingen, Porter, & Simkhada, 2008)

Implications for Policy

One of the greatest challenges in policy evaluation is to be able to demonstrate how a specific policy can change outcomes like health service utilization, and infant outcomes. It is important that leaders, stakeholders, and policymakers involved in developing health policies in Ghana understand the impact of the maternal and child health provision of the health care reform (NHIS) as an incremental policy towards universal health insurance. Likewise, lessons learned from this study, and continued evaluations are important for policymakers and leaders in Burkina Faso to adjust strengthen ongoing efforts to implement a more comprehensive health policy for the entire population.

Increased health service utilization, as demonstrated by the study's findings, is an indicator that successful implementation of policies can potentially make a difference in attaining set sustainable developmental goals. Indeed, post policy; there was an associated increase in the utilization of selected health services in both countries that may be attributable to the implementation of the policies. Improved health outcomes may ultimately be achieved through the appropriate and timely use of health care services. For instance, a study in Brazil found that increased use of prenatal care services had a positive effect on the reduction of low birth weight among uncomplicated pregnancies with a high risk of low birth weight (Wehby et al., 2009). In this study, we found that in Burkina Faso, the utilization of health services during the perinatal and postnatal periods were associated with favorable child health outcomes.

Also, it is important that policymakers guarantee continued funding and begin to adjust the funding as needs increase and demand consequently increase. Evidence from this study as

well as others points to the potential effectiveness of subsidies as a mean to increase maternal utilization and child health outcomes. Studies in Mauritania and Afghanistan for example, have revealed a positive association between lower costs of delivery care and increased utilization of health care (Renaudin et al., 2007; Mayhew et al., 2008). Undoubtedly, further research is needed to establish the evidence-based needed for sustainable and inclusive health system reforms in Sub-Saharan Africa.

Recommendations

Access to care is challenging in developing countries, and in particular for those living in rural areas. To increase access to health care, essential services which can be accessed promptly must be available. Besides financial barriers, many other factors are obstacles to service utilization:

- Means to reach and use services, such as transportation to services which may be located at a distance.
- Assurance in the ability to communicate with healthcare providers.
- Confidence in the ability to use services without compromising traditions, social, religious and cultural beliefs.
- Trust in the quality of the care received.

Our result showed that distance to the health facility was a major problem for most women. Indeed, poor roads and lack of facilities in remote areas is a major issue in countries like Ghana and Burkina Faso. While implementing policies that reduce the financial barriers to utilization, effort should also be made to limit barriers such as poor and inaccessible roads, lack of electricity, and inadequate infrastructures. For instance, increasing the number of ambulances or including the cost of transportation in the health package may be of great help to women in

rural areas. There is a need for effective ways to retain and attract qualified workers in rural areas through financial and non-financial intensives, better working environment (access to necessary medications, water, and electricity), career development plans, etc.

In addition to improving roads conditions and increasing facilities and resource availability, there is a need for increased training and supervision of the healthcare staff. With lower literacy rates in rural areas, healthcare workers should be trained on proper ways to communicate with patients that may have a language barrier and treat them with respect and dignity. The fear of being marginalized or mistreated by a trained professional at health facilities is a major driver of home deliveries (Bohren et al., 2015; HERA & Health Partners, 2013). Along with communication, another critical aspect is cultural sensitivity. Many women forgo healthcare facilities due to cultural, religious or social norms, especially during child labor. One study demonstrated how the accommodation of a cultural practice of delivering in a squatting position in healthcare facilities in Ghana led to an increase in facility-based delivery (HERA & Health Partners, 2013; Sychareun et al., 2012). The lack of gender diversity is another challenge to service utilization in many communities as certain beliefs prevent women from being assisted by a male staff during labor or delivery.

Lastly, negative perception of the quality of care and staff developed based on past experiences, may deter women from delivering at a healthcare facility. Previous studies on customer satisfaction cited staff attitudes, procedures, and availability of supply as reasons for women and their families to forgo the use of services (Bohren et al., 2015; HERA & Health Partners, 2013; Richard et al., 2013; Witter, Adjei, Armar-Klemesu, & Graham, 2009). Staff training/re-training, integration of feedback/counseling, facilities capacity building in terms of infrastructure and equipment, and increased efficiency of services to minimize delays can

adequately resolve that issue (HERA & Health Partners, 2013; Okonofua et al., 2017; Witter et al., 2009).

Limitations

The main limitation of this study was the use of secondary data for the analyses. Such data limits the researcher regarding the questions or information it provides. It also limits the researcher's ability to adjust for potential confounding factors for which data is unavailable. There are several variables that would have made the results more robust such as: mothers self-reported health status, children's health status, mother's behaviors (including alcohol consumption), death records verifying age at death, insurance status (Burkina Faso), accurate and complete data on premature births or low birth weight, and additional years of data collected after the policy was implemented (Burkina Faso). Further, the analytical approach was restricted to bivariate analysis for the assessment of infant health outcomes due to limited variation in the neonatal and infant mortality variables, missing data and consequently smaller sample sizes.

Having nonconsecutive years of data, within and between countries, limited the study ability to assess the effect of both policies in a more comprehensive way. Although the research design maximized the number of similar questions between the surveys, there were some questions unavailable in the 2003 Burkina Faso surveys - such as insurance questions - that would have been useful to have to be able to make inference about the impact of the policy.

Also, with any survey, errors may occur during data collection, reporting, transcribing or coding, thereby compromising data quality. However, the Demographic and Health Surveys (DHS) are nationally representative household surveys that provide data for a broad range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition, and as much as possible errors have been rigorously checked, noted and corrected where possible.

Because surveys rely on the individual's responses that can rarely be verified for accuracy, there is also a potential for recall bias. In general, women who have experienced adverse health outcomes may be more likely to recall and report them. Additionally, women may respond one way or the other to satisfy social norms and may have provided responses they thought the researcher wanted to hear.

Notwithstanding all the mentioned limitations, this study controlled for as many external factors as possible through its study design. Using the Anderson Behavioral Model as a conceptual framework, the study controlled for need, enabling and predisposing factors as well as health behavior factors that have been demonstrated in the existing literature to influence health seeking behavior.

Directions for Future Research

Health Services Utilization

Additional research to assess the policies' impact on out of pocket expenditure is needed. Such studies should specifically address the primary drivers of health expenses and the financial barriers to care. Such comparative assessments can be done on several dimensions, including examining the relative effectiveness and the variance in health expenditure following various health reform. Furthermore, it will be important to identify barriers to health utilization and understand women health seeking behavior. As shown in the findings, many women are still not taking advantage of the provided health care services. What is the reason behind the lack of use? What can be a done to increase the utilization rates? Answers to these questions will add to the body of knowledge about policy evaluation and will help inform future policy design and implementation efforts.

Infant Health Outcomes Research

Additional evidence is needed on the determinants of child health outcomes. Such work can shape the development of new policies or inform the modification of existing policies to improve health outcomes for children. It was interesting to note that in this study, both policies appeared to have little direct impact on child health outcomes. But since past literature failed to find an association between access to health service and improved child health outcomes, researchers in future studies could examine the combined effect of factors such education or literacy, birth spacing and premature birth.

Other Health Policy Research

Additional health policy research is needed to evaluate the impact global health agenda setting in U.S., and developed nations have on health system reforms in developing countries. Does the designated disease-specific or program-specific funding from donors, which is much larger in scale, deter local country efforts addressing health system reform?

Conclusion

The NHIS free maternal care policy and the EmONC 80% subsidy were established as a response to a national problem in Ghana and Burkina Faso among women and children. Utilization of essential health services that impact maternal, neonatal and infant mortality such as prenatal care, having a skilled birth attendant at labor and delivery, and postnatal check-ups has improved since the implementation of these policies. The policies may have had little direct impact on child health outcomes.

Few considerations that may help increase utilization of care service for both countries:

- Improve road conditions
- Increase the number of facilities and human capacity
- Facilitate transportation from rural areas – more ambulances
- Train staff to better communicate with patients
- Cultural sensitivity and awareness training is needed
- Improve confidentiality and privacy
- Include family planning in healthcare package

Some considerations for Ghana, in particular, include:

- Improve the registration system
- Simplify the insurance claim process
- Improve reimbursement method

References

Abdullahi, A. A. (2011). Trends and challenges of traditional medicine in Africa. *African Journal of Traditional, Complementary and Alternative Medicines, 8*(5 Suppl), 115-123. doi:doi: 10.4314/ajtcam.v8i5S.5

Abuya, B. A., Ciera, J., & Kimani-Murage, E. (2012). Effect of mother's education on child's nutritional status in the slums of Nairobi. *BMC pediatrics, 12*(1), 80. doi:10.1186/1471-2431-12-80

Adu-Gyamfi, A., Brenya, E., & Amoah, A. (2015). National Health Insurance Scheme of Ejisu-Juaben and Matters Arising. *International Journal of Science Studies, 3*(5), 40-60. doi:10.11114/ijsss. V3i5.962

Afulani, P. A. (2015). Determinants of stillbirths in Ghana: does quality of antenatal care matter? *BMC pregnancy and childbirth, 16*(132). doi:10.1186/s12884-016-0925-9

Ahmed, S., Li, Q., Liu, L., & Tsui, A. O. (2012). Maternal deaths averted by contraceptive use: an analysis of 172 countries. *The Lancet, 38D* (9837), 111-125. doi:10.1016/S0140-6736(12)60478-4

Ali, A. A., Osman, M. M., Abbaker, A. O., & Adam, I. (2010). Use of antenatal care services in Kassala, eastern Sudan. *BMC pregnancy and childbirth, 10*(1), 67. doi:10.1186/1471-2393-10-67

Alkema, L., Chou, D., Hogan, D., Zhang, S., Moller, A.-B., Gemmill, A., United Nations Maternal Mortality Estimation Inter-Agency Group collaborators and technical advisory group. (2016). Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The Lancet, 387*(10017),

462-474. doi:10.1016/S0140-6736(15)00838-7

Alvarez, J. L., Gil, R., Hernández, V., & Gil, A. (2009). Factors associated with maternal mortality in Sub-Saharan Africa: an ecological study. *BMC public health, 9*(1), 462. doi:10.1186/1471-2458-9-462

Amporfu, E. (2013). Equity of the premium of the Ghanaian national health insurance scheme and the implications for achieving universal coverage. *International Journal for Equity in Health, 12*(1), 4. doi:10.1186/1475-9276-12-4 ·

Andersen, R. (1968). *A behavioral model of families' use of health services* (Vol. 25): Center for Health Administration Studies, University of Chicago, 1968

Andersen, R. (1995). Revisiting the behavioral model and access to medical care: does it matter? *Journal of health and social behavior, 36*(1), 1-10.

Apoya, P., & Marriott, A. (2011). Achieving a shared goal: free universal healthcare in Ghana. Retrieved from achieving a shared goal: free universal healthcare in Ghana

Babitsch, B., Gohl, D., & von Lengerke, T. (2012). Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998–2011. *GMS Psycho-Social-Medicine, 9*, Doc11. doi:10.3205/psm000089.

Basu, A. M., & Stephenson, R. (2005). Low levels of maternal education and the proximate determinants of childhood mortality: a little learning is not a dangerous thing. *Social science & medicine, 60*(9), 2011-2023. doi: 10.1016/j.socscimed.2004.08.057

Belaid, L., & Ridde, V. (2014). Contextual factors as a key to understanding the heterogeneity of effects of a maternal health policy in Burkina Faso? *Health policy and planning*. doi:10.1093/heapol/czu012

Birmeta, K., Dibaba, Y., & Woldeyohannes, D. (2013). Determinants of maternal health care

utilization in Holeta town, central Ethiopia. *BMC health services research, 13*(1), 256. doi:10.1186/1472-6963-13-256

Blanchet, N. J., Fink, G., & Osei-Akoto, I. (2012). The Effect of Ghana's National Health Insurance Scheme on Health Care Utilisation. *Ghana Med J., 46*(2), 76-84.

Bliss, K. E., & Streifel, C. (2014). *Improving Maternal, Neonatal, and Child Health in Ghana*. Retrieved from Center for Strategic & International Studies: https://csis-prod.s3.amazonaws.com/s3fs-public/legacy_files/files/publication/141118_Bliss_ImprovingHealthGhana_Web.pdf

Bohren, M. A., Vogel, J. P., Hunter, E. C., Lutsiv, O., Makh, S. K., Souza, J. P., . . . Gülmezoglu, A. M. (2015). The Mistreatment of Women during Childbirth in Health Facilities Globally: A Mixed-Methods Systematic Review. *PLoS Med*. doi:http://dx.doi.org/10.1371/journal.pmed.1001847

Bosomprah, S., Ragno, P. L., Gros, C., & Banskota, H. (2015). Health insurance and maternal, newborn services utilization and under-five mortality. *BioMed Central, 73*(1), 1-7. doi:10.1186/s13690-015-0101-0

Browne, J. L., Kayode, G. A., Arhinful, D., Fidder, S. A. J., Grobbee, D. E., & Klipstein-Grobusch, K. (2016). Health insurance determines antenatal, delivery and postnatal care utilization: evidence from the Ghana Demographic and Health Surveillance data. *BMJ open, 6*(3), e008175. doi:10.1136/bmjopen-2015-008175

Brugiavini, A., & Pace, N. (2011). Extending health insurance: effects of the national health insurance scheme in Ghana. *Health economics review, 6*(1), 7. doi:10.1186/s13561-016-0083-9

Brugiavini, A., & Pace, N. (2016). Extending health insurance in Ghana: effects of the National

Health Insurance Scheme on maternity care. *Health economics review, 6*(1), 7. doi:10.1186/s13561-016-0083-9

Campinha-Bacote, J. (2003). Many faces: Addressing diversity in health care. *Online Journal of Issues in Nursing, 8*(1), 3.

Central Intelligence Agency. (2016). The World FactBook Africa: Burkina Faso. Retrieved from https://www.cia.gov/library/publications/resources/the-world-factbook/geos/uv.html

Chankova, S., Atim, C., & Hatt, L. (2010). Ghana's National Health Insurance Scheme

Chiriboga, S. E. R. (2008). *Incremental health system reform policy in Ecuador: Assessing the impact Ecuador's Law for the Provision of Free Maternity and Child Health Care (LMGAI) has on health services utilization, infant health outcomes and expenditures.* (Doctor of Philosophy Dissertation), Johns Hopkins University, Baltimore, Maryland. Retrieved from http://media.proquest.com/media/pq/classic/doc/1537010541/fmt/ai/rep/SPDF?_s=09T2opwYcvTLPi9entM8KNUg8Wg%3D (3309815)

Chuma, J., & Maina, T. (2013). *Free maternal care and removal of user fees at primary-level facilities in Kenya. Monitoring the Implementation and Impact: Baseline Report*. Retrieved from Washington DC: Health policy Project, Futures Group: http://www.healthpolicyproject.com/pubs/400_KenyaUserFeesBaselineReportFINAL.pdf

Cotlear, D., Nagpal, S., Smith, O., Tandon, A., & Cortez, R. (2015). *Going Universal: How 24 Developing Countries are Implementing Universal Health Coverage from the Bottom Up* (99455). Retrieved from Washington, DC: World Bank Group: http://documents.worldbank.org/curated/en/936881467992465464/pdf/99455-PUB-Box393200B-OUO-9-PUBDATE-9-28-15-DOI-10-1596-978-1-4648-0610-0-EPI-

210610.pdf

Crowe, S., Utley, M., Costello, A., & Pagel, C. (2012). How many births in sub-Saharan Africa and South Asia will not be attended by a skilled birth attendant between 2011 and 2015? *BMC pregnancy and childbirth, 12*(1), 4. doi:10.1186/1471-2393-12-4

Dalinjong, P. A., & Laar, A. S. (2012). The national health insurance scheme: perceptions and experiences of health care providers and clients in two districts of Ghana. *Health economics review, 2*(1), 13. doi:10.1186/2191-1991-2-13

De Allegri, M., Ridde, V., Louis, V. R., Sarker, M., Tiendrebéogo, J., Yé, M., Jahn, A. (2012). The impact of targeted subsidies for facility-based delivery on access to care and equity – evidence from a population-based study in rural Burkina Faso. *Journal of public health policy, 33*(4), 439-453. doi:10.1057/jphp.2012.27

Diop, F., Yazbeck, A., & Bitran, R. (1995). The impact of alternative cost recovery schemes on access and equity in Niger. *Health policy and planning, 10*(3), 223-240. doi:10.1093/heapol/10.3.223

Dixon, J., Tenkorang, E. Y., & Luginaah, I. (2011). Ghana's National Health Insurance Scheme: helping the poor or leaving them behind? *Environment and Planning C: Government and policy, 29*(6), 1102-1115.

Dixon, J., Tenkorang, E. Y., & Luginaah, I. (2013). Ghana's National Health Insurance Scheme: a national level investigation of members' perceptions of service provision. *BMC international health and human rights, 13*(1), 35. doi:10.1186/1472-698X-13-35

Dong, H., Gbangou, A., De Allegri, M., Pokhrel, S., & Sauerborn, R. (2008). The differences in characteristics between health-care users and non-users: implication for introducing community-based health insurance in Burkina Faso. *The European Journal of Health*

Economics, 9(1), 41-50. doi:10.1007/s10198-006-0031-4

Du Preez, A. (2010). *Quality improvement intervention program (QIIP) for intrapartum care.* (Doctor of Philosophy Dissertation), North-West University, Potchefstroom Campus, North-West University. Retrieved from https://repository.nwu.ac.za/bitstream/handle/10394/4816/duPreez_A.pdf?sequence=2&isAllowed=y (12016772)

du Preez, A. (2012). Understanding the phenomenon of dikgaba and related health practices in pregnancy: A study among the Batswana in the rural North West Province in South Africa. *Evidence Based Midwifery-Royal College of Midwives Library, 10*(1), 29-34.

Dzakpasu, S., Soremekun, S., Manu, A., Asbroek, G., Tawiah, C., Hurt, L., Kirkwood, B. (2012). Impact of free delivery care on health facility delivery and insurance coverage in Ghana's Brong Ahafo region. *PloS one, 7*(11), e49430. doi: 10.1371/journal.pone.0049430

Eele, G. (2015). Building Statistical Capacity: The Challenges (7). Retrieved from http://www.paris21.org/sites/default/files/PARIS21-DiscussionPaper7-StatisticalCapacity.pdf

Evans, D. B., & Etienne, C. (2010). Health systems financing and the path to universal coverage. *Bulletin of the World Health Organization, 88*(6), 402-403. doi:10.2471/BLT.10.078741

Evans, R. G., & Stoddart, G. L. (1990). Producing health, consuming health care. *Social science & medicine, 31*(12), 1347-1363. doi:10.1016/0277-9536(90)90074-3

Finlayson, K., & Downe, S. (2013). Why do women not use antenatal services in low-and-middle-income countries? A meta-synthesis of qualitative studies. *PLoS Med, 10*(1), e1001373. doi: 10.1371/journal.pmed.1001373

Gabrysch, S., & Campbell, O. M. (2009). Still too far to walk: Literature review of the determinants of delivery service use. *BMC Pregnancy & Childbirth, 11*(9), 34. doi:10.1186/1471-2393-9-34

Garner, P. (1989). The Bamako Initiative: Financing health in Africa by selling drugs [Press release]. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1837154/pdf/bmj00243-0007.pdf

Garson, G. D. (2016). *Logistic Regression: Binomial and Multinomial* (2016 ed.). Asheboro, NC: Statistical Associates Publishers.

Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF International. (2015). *Ghana Demographic and Health Survey 2014*. Retrieved from Rockville, MD: http://dhsprogram.com/pubs/pdf/FR307/FR307.pdf

Ghana Statistical Service (GSS), Ghana Health Service (GHS), & ICF Macro. (2009). *Ghana Demographic and Health Survey 2008: Key Findings*. Retrieved from Calverton, MD: https://dhsprogram.com/pubs/pdf/SR172/SR172.pdf

Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), & ORC Macro. (2004). *Ghana Demographic and Health Survey 2003*. Retrieved from Calverton, MD: http://dhsprogram.com/pubs/pdf/FR152/FR152.pdf

National Health Insurance Bill 2003: memorandum, 1 Cong. Rec. (2003).

Gnawali, D. P., Pokhrel, S., Sié, A., Sanon, M., De Allegri, M., Souares, A., Sauerborn, R. (2009). The effect of community-based health insurance on the utilization of modern health care services: evidence from Burkina Faso. *Health policy, 90*(2-3), 214-222. doi: 10.1016/j.healthpol.2008.09.015

Gobah, F. F. K., & Liang, Z. (2011). The National Health Insurance Scheme in Ghana: Prospects

and Challenges: a Cross-Sectional Evidence. *Global Journal of Health Science, 3*(2), 90. doi:10.5539/gjhs. v3n2p90

Gochman, D. S. (1988). *Health Behavior: Emerging Research Perspectives* Ney York: Plenum Press: Springer.

Graham, W. J., Bell, J. S., & Bullough, C. H. (2001). Can skilled attendance at delivery reduce maternal mortality in developing countries. *Safe motherhood strategies: a review of the evidence, 17*, 97-130.

Grossman, M. (1972). On the concept of health capital and the demand for health. *Journal of Political economy, 80*(2), 223-255.

Hatt, L. E., Makinen, M., Madhavan, S., & Conlon, C. M. (2013). Effects of user fee exemptions on the provision and use of maternal health services: a review of the literature. *Journal of health, population, and nutrition, 31*(4 Suppl 2), 67-80.

Health Systems 20/20 Project and Research, & Development Division of the Ghana Health Service. (2009). *An Evaluation of the Effects of the National Health Insurance Scheme in Ghana*. Retrieved from Bethesda, MD: http://pdf.usaid.gov/pdf_docs/PNADX710.pdf

Heidhues, F., & Obare, G. (2011). Lessons from structural adjustment programs and their effects in Africa. *Quarterly Journal of International Agriculture, 50*(1), 55-64.

HERA, & Health Partners. (2013). *Evaluation of the free maternal health care initiative in Ghana*. Retrieved from Accra, Ghana & Reet, Belgium: https://www.unicef.org/evaldatabase/files/Ghana_130517_Final_Report.pdf

Hounton, S., Menten, J., Ouédraogo, M., Dubourg, D., Meda, N., Ronsmans, C., De Brouwere, V. (2008). Effects of a Skilled Care Initiative on pregnancy-related mortality in rural Burkina Faso. *Tropical medicine & international health, 13*(s1), 53-60.

doi:10.1111/j.1365-3156.2008. 02087.x

Ijadunola, K. T., Ijadunola, M. Y., Esimai, O. A., & Abiona, T. C. (2010). New paradigm old thinking: the case for emergency obstetric care in the prevention of maternal mortality in Nigeria. *BMC women's health, 10*(1), 6. doi:10.1186/1472-6874-10-6

Institut National de la Statistique et de la Démographie (INSD), & ICF International. (2012). *Enquête Démographique et de Santé et à Indicateurs Multiples du Burkina Faso 2010*. Retrieved from Calverton, MD: http://www.unicef.org/bfa/french/bf_eds_2010.pdf

Institut National de la Statistique et de la Démographie (INSD), & ORC Macro. (2004). *Enquête Démographique et de Santé du Burkina Faso 2003*. Retrieved from Calverton, MD: http://dhsprogram.com/pubs/pdf/FR154/FR154.pdf

Institute for Health Metrics and Evaluation. Burkina Faso. Retrieved from http://www.healthdata.org/burkina-faso

James, C. D., Hanson, K., McPake, B., Balabanova, D., Gwatkin, D., Hopwood, I., Morris, S. S. (2006). To retain or remove user fees? Reflections on the Current Debate in Low- and Middle-Income Countries. *Applied health economics and health policy, 5*(3), 137-153. doi:10.2165/00148365-200605030-00001

Jamison, D., Feachem, R., Makgoba, M., Bos, E., Baingana, F., Hofman, K., & Rogo, K. (2006). *Disease and mortality in sub-Saharan Africa*. Washington (DC: World Bank

Jehu-Appiah, C., Aryeetey, G., Agyepong, I., Spaan, E., & Baltussen, R. (2012). Household perceptions and their implications for enrolment in the National Health Insurance Scheme in Ghana. *Health policy and planning, 27*(3), 222-233. doi:10.1093/heapol/czr032

Joint Learning Network for Universal Health Coverage. Ghana: National Health Insurance Scheme (NHIS). Retrieved from

http://programs.jointlearningnetwork.org/content/national-health-insurance-scheme-nhis

Kutzin, J. (2013). Health financing for universal coverage and health system performance: concepts and implications for policy. *Bulletin of the World Health Organization, 91*(8), 602-611. doi:10.2471/BLT.12.113985

Lagarde, M., & Palmer, N. (2008). The impact of user fees on health service utilization in low-and-middle-income countries: how strong is the evidence? *Bulletin of the World Health Organization, 86*(11), 839-848. doi:10.2471/BLT.07.049197

Lewycka, S., Mwansambo, C., Kazembe, P., Phiri, T., Mganga, A., Rosato, M., Costello, A. (2010). A cluster randomized controlled trial of the community effectiveness of two interventions in rural Malawi to improve health care and to reduce maternal, newborn and infant mortality. *Trials, 11*(1), 88. doi:10.1186/1745-6215-11-88

Lomazzi, M., Borisch, B., & Laaser, U. (2014). The Millennium Development Goals: experiences, achievements and what's next. *Global health action, 7*. doi:10.3402/gha.v7.23695

McIntyre, D., Garshong, B., Mtei, G., Meheus, F., Thiede, M., Akazili, J., Goudge, J. (2008). Beyond fragmentation and towards universal coverage: insights from Ghana, South Africa and the United Republic of Tanzania. *Bulletin of the World Health Organization, 86*(11), 871-876.

McIntyre, D., Gibson, L., & Mutyambizi, V. (2005). *Promoting equitable health care financing in the African context: Current challenges and future prospects*. Retrieved from http://www.equinetafrica.org/sites/default/files/uploads/documents/DIS27fin.pdf

McPake, B., Hanson, K., & Mills, A. (1993). Community financing of health care in Africa: an evaluation of the Bamako initiative. *Social science & medicine, 36*(11), 1383-1395.

doi:10.1016/0277-9536(93)90381-D

National health insurance policy framework for Ghana- revised version, (2004).

Ministry of Health. (2006). *Plan de mise en oeuvre de la stratégie nationale subvention des accouchements et des soins obstétricaux et néonatals d'urgence au Burkina*. Retrieved from Ouagadougou, Burkina Faso: http://www.sante.gov.bf/phocadownload/Textes_fondamentaux/Autres/2.pdf

Morris, J. L., Short, S., Robson, L., & Andriatsihosena, M. S. (2014). Maternal health practices, beliefs, and traditions in southeast Madagascar. *African journal of reproductive health, 18*(3), 101-117.

Moss, W., Darmstadt, G. L., Marsh, D. R., Black, R. E., & Santosham, M. (2002). Research priorities for the reduction of perinatal and neonatal morbidity and mortality in developing country communities. *Journal of Perinatology, 22*(6), 484-495. doi:10.1038/sj.jp.7210743

Mullick, S., & Serle, E. (2011). Achieving Millennium Development Goals 4 and 5: a snapshot of life in rural India. *BJOG. 118*(Suppl 2), 104-107. doi:10.1111/j.1471-0528.2011.03120.x

Munos, M. K. (2012). *Neonatal care practices, morbidity, and care-seeking in rural Burkina Faso.* (Doctor of Philosophy Dissertation), the Johns Hopkins University, Baltimore, Maryland. Retrieved from http://search.proquest.com/docview/1287991869 (3536098)

National Health Insurance Authority. (2013). *National Health Insurance Authority 2013 Annual Report*. Retrieved from Accra, Ghana: http://www.nhis.gov.gh/files/2013%20Annual%20Report-Final%20ver%2029.09.14.pdf

National Health Insurance Scheme. (2016). Capitation. Retrieved from

http://nhis.gov.gh/capitation.aspx

Nyonator, F., & Kutzin, J. (1999). Health for some? The effects of user fees in the Volta Region of Ghana. *Health policy and planning, 14*(4), 329-341.

Okonofua, F., Ogu, R., Agholor, K., Okike, O., Abdus-salam, R., Gana, M., The WHARC WHO FMOH MNCH Implementation Research Study Team. (2017). Qualitative assessment of women's satisfaction with maternal health care in referral hospitals in Nigeria. *BioMed Central*. doi:10.1186/s12978-017-0305-6

Owusu–Mensah, S. (2010). *Assessing the clientele satisfaction of the implementation of the national health insurance policy in Ghana: a comparative study of the district and private mutual health insurance schemes.* (Master of Science), Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. Retrieved from http://ir.knust.edu.gh/bitstream/123456789/403/1/SAMUEL%20OWUSU%20%e2%80%93%20MENSAH.pdf (PG1089307)

Preker, A. S., & Carrin, G. (2004). *Health financing for poor people: resource mobilization and risk sharing* (Vol. 434). Washington, DC: World Bank.

Prydz, E. B. (2013). 'Knowing in Time': How technology Innovations in Statistical Data Collection can make a Difference in Development. Retrieved from https://www.oecd.org/site/oecdgfd/Session%203.2%20-%20GFD%20Background%20Paper%20-%20DRAFT.pdf

Ravishankar, N., Gubbins, P., Cooley, R. J., Leach-Kemon, K., Michaud, C. M., Jamison, D. T., & Murray, C. J. L. (2009). Financing of global health: tracking development assistance for health from 1990 to 2007. *The Lancet, 373*(9681), 2113-2124. doi:10.1016/S0140-6736(09)60881-3

Richard, F., Antony, M., Witter, S., Kelley, A., Sieleunou, I., Kafando, Y., & Meessen, B. (2013). Fee exemption for maternal care in Sub-Saharan Africa: a review of 11 countries and lessons for the region. *Global Health Governance, 6*(2), 52-72.

Ridde, V. (2003). Fees-for-services, cost recovery, and equity in a district of Burkina Faso operating the Bamako Initiative. *Bulletin of the World Health Organization, 81*(7), 532-538.

Ridde, V. (2011). Is the Bamako Initiative still relevant for West African health systems? *International Journal of Health Services, 41*(1), 175-184.

Ridde, V., Richard, F., Bicaba, A., Queuille, L., & Conombo, G. (2011). The national subsidy for deliveries and emergency obstetric care in Burkina Faso. *Health policy and planning, 26*(Suppl 2), ii30-ii40. doi:10.1093/heapol/czr060

Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education & Behavior*, *15*(2), 175-183.

Saifuddi, A., Creanga, A. A., Gillespie, D. G., & Tsui, A. O. (2010). Economic status, education, and empowerment: implications for maternal health service utilization in developing countries. *PloS one*, *5*(6), e11190. doi: 10.1371/journal.pone.0011190

Sakeah, E., Doctor, H. V., McCloskey, L., Bernstein, J., Yeboah-Antwi, K., & Mills, S. (2014). Using the community-based health planning and services program to promote skilled delivery in rural Ghana: socio-demographic factors that influence women utilization of skilled attendants at birth in northern Ghana. *BMC public health, 14*(1), 344. doi:10.1186/1471-2458-14-344

Sarker, B. K., Rahman, M., Rahman, T., Hossain, J., Reichenbach, L., & Mitra, D. K. (2016). Reasons for Preference of Home Delivery with Traditional Birth Attendants (TBAs) in

Rural Bangladesh: A Qualitative Exploration. *PloS one, 11*(1), e0146161.

Sauerborn, R., Nougtara, A., & Diesfeld, H.-J. (1989). Low utilization of community health workers: results from a household interview survey in Burkina Faso. *Social science & medicine, 29*(10), 1163-1174.

Shimamoto, K., & Gipson, J. D. (2015). The relationship of women's status and empowerment with skilled birth attendant use in Senegal and Tanzania. *BMC Pregnancy & Childbirth, 15*(1), 154. doi:10.1186/s12884-015-0591-3

Shrestha, V. (2016). *Can Basic Maternal Literacy Skills Improve Infant Health Outcomes? Evidence from the Education Act in Nepal.* (Working Paper Series Working Paper Series), Townson University, Townson, Maryland. Retrieved from http://webapps.towson.edu/cbe/economics/workingpapers/2016-08.pdf (2016-08)

Simkhada, B., Teijlingen, E. R., Porter, M., & Simkhada, P. (2008). Factors affecting the utilization of antenatal care in developing countries: a systematic review of the literature. *Journal of Advanced Nursing, 61*(3), 244-260. doi:10.1111/j.1365-2648.2007. 04532.x

Singh, A., Kumar, A., & Pranjali, P. (2014). Utilization of maternal health care among adolescent mothers in urban India: evidence from DLHS-3. *PeerJ, 2*, e592. doi:10.7717/peerj.592

Singh, K., Osei-Akoto, I., Otchere, F., Sodzi-Tettey, S., Barrington, C., Huang, C., Speizer, I. (2015). Ghana's National Health insurance scheme and maternal and child health: a mixed methods study. *BMC Health Serv Res., 15*(1), 108. doi:10.1186/s12913-015-0762-y

Snow, R. W., & Omumbo, J. A. (2006). Chapter 14: Malaria. In D. T. Jamison, R. G. Feachem, & M. W. Makgoba (Eds.), *Disease and Mortality in Sub-Saharan Africa* (2nd ed.).

Washington, DC: The International Bank for Reconstruction and Development / the World Bank.

Sommerfeld, J., Sanon, M., Kouyate, B. A., & Sauerborn, R. (2002). Informal risk-sharing arrangements (IRSAs) in rural Burkina Faso: lessons for the development of community-based insurance (CBI). *The International journal of health planning and management, 17*(2), 147-163. doi:10.1002/hpm.661

Sychareun, V., Hansana, V., Somphet, V., Xayavong, S., Phengsavanh, A., & Popenoe, R. (2012). Reasons rural Laotians choose home deliveries over delivery at health facilities: a qualitative study. *BMC pregnancy and childbirth, 12*(1), 86. doi:10.1186/1471-2393-12-86

Thaddeus, S., & Maine, D. (1994). Too far to walk: maternal mortality in context. *Social science & medicine, 38*(8), 1091-1110. doi:10.1016/0277-9536(94)90226-7

The Demographic and Health Survey. (2016). DHS Program: Dataset. Retrieved from http://dhsprogram.com/data/Dataset-Types.cfm

Tinker, A., & Ransom, E. (2002). *Healthy mothers and healthy newborns: the vital link*. Retrieved from Washington, DC: http://www.prb.org/pdf/HealthyMothers_Eng.pdf

TUBS (Cartographer). (2012). Map of administrative divisions of Burkina Faso. Retrieved from https://commons.wikimedia.org/wiki/File:Burkina_Faso,_administrative_divisions_-_de_-_colored.svg

U. S. Central Intelligence Agency (Cartographer). (2007). Ghana Administrative Divisions. Retrieved from http://www.lib.utexas.edu/maps/africa/ghana_admin_2007.jpg

UNICEF. (2009). *Maternal and child health: the social protection dividend-west and central Africa*. Retrieved from Dakar, Senegal:

https://www.unicef.org/wcaro/wcaro_UNICEF_ODI_4_Health_Social_Protection_Dividends.pdf

Unicef. (2015). Millenium Development Goals: Improve maternal health Retrieved from http://www.unicef.org/mdg/maternal.html

UNICEF, WHO, World Bank Group, & United Nations. (2015). *Levels & Trends in Child Mortality*. Retrieved from http://www.childmortality.org/files_v20/download/IGME%20Report%202015_9_3%20LR%20Web.pdf

United Nations. (2014). *The Millennium Development Goals Report 2014* (978-92-1-101308-5). Retrieved from New York: http://www.un.org/millenniumgoals/2014%20MDG%20report/MDG%202014%20English%20web.pdf

United Nations. (2015). *The Millennium Development Goals Report 2015* (978-92-1-101308-5). Retrieved from New York: http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf

Uzochukwu, B., & Onwujekwe, O. E. (2004). Socio-economic differences and health seeking behavior for the diagnosis and treatment of malaria: a case study of four local government areas operating the Bamako initiative program in southeast Nigeria. *International Journal for Equity in Health, 3*(1), 6. doi:10.1186/1475-9276-3-6

Waddington, C., & Enyimayew, K. A. (1990). A price to pay, part 2: The impact of user charges in the Volta region of Ghana. *The International journal of health planning and management, 5*(4), 287-312. doi:10.1002/hpm.4740050405

Waddington, C. J., & Enyimayew, K. A. (1989). A price to pay: The impact of user charges in Ashanti-Akim district, Ghana. *The International journal of health planning and management, 4*(1), 17-47. doi:10.1002/hpm.4740040104

Wehby, G. L., Murray, J. C., Castilla, E. E., Lopez-Camelo, J. S., & Ohsfeldt, R. L. (2009). Prenatal care effectiveness and utilization in Brazil. *Health policy and planning, 3*, 175-188. doi:10.1093/heapol/czp005

WHO, UNICEF, UNFPA, the World Bank, & United Nations Population Division. (2014). *Trends in Maternal Mortality: 1990 to 2013*. Retrieved from Geneva, Switzerland: http://www.unfpa.org/sites/default/files/pub-pdf/9789241507226_eng.pdf

WHO, UNICEF, UNFPA, World Bank Group, & United Nations Population Division. (2015). *Trends in Maternal Mortality: 1990 to 2015*. Retrieved from Geneva: http://apps.who.int/iris/bitstream/10665/194254/1/9789241565141_eng.pdf?ua=1

Wilson, R. J., Paterson, P., Jarrett, C., & Larson, H. J. (2015). Understanding factors influencing vaccination acceptance during pregnancy globally: a literature review. *Vaccine, 33*(47), 6420-6429. doi: 10.1016/j.vaccine.2015.08.046

Witter, S., Adjei, S., Armar-Klemesu, M., & Graham, W. (2009). Providing free maternal health care: ten lessons from an evaluation of the national delivery exemption policy in Ghana. *Glob Health Action*. doi:10.3402/gha. v2i0.1881

World Health Organization. (2000). *General guidelines for methodologies on research and evaluation of traditional medicine*. Geneva: World Health Organization.

World Health Organization. (2004). Making pregnancy safer: the critical role of the skilled attendant, 18. Retrieved from World Health Organization website: http://apps.who.int/iris/bitstream/10665/42955/1/9241591692.pdf

World Health Organization. (2010). *Health systems financing: the path to universal coverage*. Retrieved from Geneva, Switzerland: http://www.who.int/whr/2010/10_summary_en.pdf

World Health Organization. (2013). *World health report 2013: Research for universal health coverage*. Retrieved from Geneva, Switzerland: http://apps.who.int/iris/bitstream/10665/85761/2/9789240690837_eng.pdf?ua=1

World Health Organization. (2015). Global Health Observation (GHO) data - Under-Five mortality. Retrieved from http://www.who.int/gho/child_health/mortality/mortality_under_five_text/en/

Yankah, B. (2009). Financial Sustainability of NHIS based on recent financial assessment of the scheme. *Presentation at Health Summit*, 16-20.

Yip, W. C.-M., Hsiao, W. C., Chen, W., Hu, S., Ma, J., & Maynard, A. (2012). Early appraisal of China's huge and complex health-care reforms. *The Lancet, 379*(9818), 833-842. doi:10.1016/S0140-6736(11)61880-1

Zabadi, I. S. (1992). *International politics of structural adjustment in sub-Saharan Africa 1983-1990: with special reference to Ghana and Nigeria.* (Doctor of Philosophy Dissertation), University of London United Kingdom. Retrieved from http://etheses.lse.ac.uk/1320/1/U062760.pdf (U062760)

Zere, E., Kirigia, J. M., Duale, S., & Akazili, J. (2012). Inequities in maternal and child health outcomes and interventions in Ghana. *BMC public health, 12*(1), 252. doi:10.1186/1471-2458-12-252.