

**Examining The Role of the Performance-Based Financing Equity Program in Increasing
Access to Maternal and Child Health Services in Cameroon: Evidence and Policy
Implications**

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Thesis submitted to the University of Ottawa
in partial fulfillment of the requirements for the
PhD Degree in Epidemiology

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Abstract

Background: Performance-based financing (PBF) is a healthcare reform that is widely adopted in low- and middle-income countries (LMICs). PBF is an intervention designed to strengthen healthcare systems in LMICs. It represents a fundamental shift towards improving healthcare amongst the most vulnerable, with a focus on maternal and child health services. Broadly, there are gaps regarding PBF's effect on healthcare systems and various aspect of healthcare, including efforts to implement universal healthcare coverage. PBF introduced an innovative component—the PBF equity instrument—geared towards achieving universal health coverage. The effect of this equity instrument has not been studied. There is significant gap regarding how it is defined and implemented in various context. Cameroon has one of the highest maternal mortality rates in sub-Saharan Africa and with high out-of-pocket expenses that impede access to maternal health services. PBF was introduced in Cameroon in 2012 with a focus on maternal health services and was adopted in 2017 as a national strategy towards achieving universal coverage, however, the definition and implementation of the PBF equity elements remain a gap in Cameroon and sub-Saharan Africa. This dissertation is focused on studying the PBF equity elements in Cameroon in order to get a broader perspective on the effect of the PBF equity elements as a policy tool in improving the lives of the most vulnerable population to ensure no one is left behind in the efforts towards achieving universal health coverage.

Objectives: This dissertation aimed (1) to investigate and characterize the effect of the PBF equity elements in improving equity in access to selected maternal services (2) to understand how the equity elements is defined and implemented in Cameroon; and (3) to generate a framework that will facilitate the identification of gaps and challenges, in turn informing policy development that is relevant to PBF equity elements in Cameroon and PBF research on equity in other countries; and (4) to explore health providers experiences before and after the introduction of PBF in Cameroon.

Methods: This dissertation employed a mixed methods approach to address the above objectives, involving the use of multiple frameworks and triangulation across and within objectives. First, to investigate the effect of PBF on equity in improving access to maternal services, I designed a systematic review with a focus on one of the equity elements—subsidizing user fees to reduce out-of-pocket expenses to improve access to maternal health services. The aim was to get a broader overview of the PBF equity element and to understand the effect of PBF on out-of-pocket expenses in improving access to selected maternal health services in sub-Saharan Africa. Second, I narrowed the assessment to a specific context-Cameroon. Given the heterogenous nature of care delivery in Cameroon, I investigated the effect of PBF on out-of-pocket expenses in improving access to selected maternal health services across healthcare sectors using a before-and-after study design. The rationale was to address the limitations of an earlier PBF impact evaluation in Cameroon, in particular, potential heterogeneity across settings and sectors which had not been considered. Third, to describe and define the implementation of the PBF equity elements in Cameroon, I conducted a grounded theory study -given that it is a new policy that has not been well studied -to understand the social processes and actions from health facilities, health providers, PBF managers and the community, and generated a theoretical framework to inform the challenges and gaps in the implementation process. Finally, as a newly adopted health reform, I conducted an in-depth qualitative study to understand the experiences of health care providers before -and- after the implementation of PBF and its equity elements and the potential for sustainability of the policy especially the equity strategies in Cameroon.

Findings: The findings provide an overarching understanding on the effect of one of the PBF equity elements in improving access to maternal health services in sub-Saharan Africa, and in particular, an understanding of the effect of the PBF equity elements in improving access and utilization of selected maternal services in Cameroon. At the health system level, the findings provide an understanding of the focus of the equity elements within the context of Cameroon and further insight on the gaps and limitations in the implementation of the PBF equity elements and the potential challenges in sustainability towards achieving universal health coverage. At the health facility level, it provides an understanding on

how the PBF equity elements is understood, defined, and implemented and provides directions on the challenges to inform policy and to guide research. At the individual level, it provides an overview of the expectations of health care providers from a supply side perspective and the potential effect it has on demand creation from women and households in improving access to maternal health services. Overall, the findings provide insight on how the equity elements are defined and implemented but also provides opportunity and areas of improvement and detailed how PBF equity elements can be further assessed and how delays in payment of PBF incentives can potentially affect the realization of the equity elements in improving access and utilization of maternal health services amongst the poor and vulnerable.

Conclusion: Equity is central and essential to the delivery of services to achieve universal health coverage. The adoption of PBF in Cameroon is a step toward achieving universal health coverage with the recognition that universal health coverage cannot be effectively implemented in an institution without good governance. The PBF initiative is viewed as an entry point for universal health coverage, in order to evaluate the level of preparedness of health facilities to embrace universal health coverage in terms of quality of health care, production, good managerial skills, and financial management. However, due to administrative bottlenecks, the government has yet to accept some of the established principles of PBF—this in turn causes delays in payment and this hampers the effective implementation of some of the PBF equity strategies. Therefore, though PBF is a national policy, the actors at the central level, i.e., the Ministry of Public Health, are not playing their role effectively in enabling full implementation of PBF best practices and theories.

Keywords: Equity, maternal health, performance-based financing, sub-Saharan Africa, low-middle-income countries, Cameroon.

Acknowledgments

My Ph.D. journey was characterized with substantial challenges. I am especially grateful to God almighty, who bestowed me with strength, courage, and wisdom to overcome.

Over the past 6 years, I have benefitted from tremendous support from many. I would first like to express my deep and sincere gratitude to my supervisors. My primary supervisor was Dr. Sanni Yaya, whose constant support, motivation, and invaluable guidance enabled me to complete my Ph.D. My co-supervisor, Dr. Julian Little, supported me every step of the way, guided me through the methodology to conduct the research and helped me present it as clearly as possible to ensure I complete my Ph.D. I am very grateful for your support and continue to look to your leadership and mentorship. Both my supervisors facilitated many remarkable opportunities and ensured I faced no obstacles. It was a privilege and honor to work and study under their guidance. I am extremely grateful for what they have offered me over the past years. I also thank my thesis advisory members, Drs. Deonandan, Pongou and Geneau for their encouragement and advice. This dissertation is complete due to their combined expertise.

I thank my mentors (including my supervisors), research colleagues, who have encouraged me throughout this journey as I managed the success of this dissertation alongside my other projects.

I thank my family and friends for their support throughout this journey. Their prayers and motivation greatly contributed to my success.

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List of Acronyms and Abbreviations

AMSTAR:	critical appraisal tool used in accessing the methodological quality of the systematic reviews
ANC:	antenatal care
ANCOVA:	analysis of covariance
ANOVA:	analysis of variance
CBA:	controlled before-and-after study
CCT:	conditional cash transfer
CFA:	Central Africa franc
CHW:	community health worker
COREQ:	criteria for qualitative interviews
C-section:	Caesarean section
CVA:	contracting verification agency
DHIS2:	district health information system
DRC:	Democratic Republic of Congo
EPOC:	Cochrane organization of care
FGD:	focus group discussion
GDP:	gross domestic product
GRADE:	grade recommendation assessment development and evaluation
HIV/AIDS:	human immune deficiency virus/acquired immune deficiency syndrome
ITS:	interrupted time series analysis
KII:	key informant interviews
LMIC:	low- and middle-income countries
MaxQDA:	qualitative data analysis software
NPAV:	non-poor and vulnerable
OOP:	out-of-pocket
PA:	principal agent theory
PAV:	poor and vulnerable
PBF:	performance-based financing
PHC:	primary health care
PRISMA:	preferred reporting items for systematic review and meta-analysis guideline

PRISMA-P:	preferred reporting items for systematic review and meta-analysis protocol
RCT:	randomized control trials
SDG:	sustainable development goals
STROBE	guidelines for reporting observation studies
UHC:	universal health coverage
WHO:	World Health Organization

Citations for Published Manuscripts

Chapter #2: Nkangu M, Little J, Omonaiye O, Yaya S. The effect of performance-based financing interventions on out-of-pocket expenses intended to improve access to and utilization of maternal health services in sub-Saharan Africa: protocol for a systematic review and meta-analysis. *Syst Rev* **11**, 133 (2022). <https://doi.org/10.1186/s13643-022-01990-9>

Chapter #7: Nkangu M, Little J, Asahngwa C, Deonandan R, Pongou R, Adams O, Yaya S. Examining the Implementation of the Performance-Based Financing Equity Strategy in Improving Access and Utilization of Maternal Health Services in Cameroon: A Qualitative Study. *International Journal of Environmental Research and Public Health*. 2022; 19(21):14132.

<https://doi.org/10.3390/ijerph192114132>

Chapters 3-6, and 8 are presented in manuscript format. Chapter 3 and 6 has been submitted for peer review and has received one round of feedback by anonymous peer reviewers. The revised version has been submitted to the peer reviewers. Chapters 4,5 and 8 have been submitted for peer review and the formatting and referencing style has been modified slightly for inclusion in this dissertation.

Contributions of authors

Chapter #2

MN conceived the idea for the systematic review protocol. MN led the design of the protocol and methodology, devised the search strategy, and wrote the first draft of the manuscript. SY and JL supervised the design of the protocol and methodology and critically revised the manuscript. OO critically revised the manuscript and provided feedback.

Chapter #3

MN conceived the idea for the systematic review, conducted screening, data collection, analysis, investigation, methodology, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. OO assisted in the screening and data collection. RD, RP, RG and OO critically revised the manuscript and provided feedback.

Chapter #4

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Chapter #5

MN conceived the idea, defined the objective, and led the design of the methodology, sampling, data collection, and data analysis approach, and wrote the original draft of the manuscript. SY, JL supervised the methodology, analysis and critically revised the manuscript. RD and RP critically revised the manuscript and provided feedback.

Chapter #6

MN conceived the idea, defined the objective, and led the design of the methodology, sampling, data collection, and data analysis approach, and wrote the original draft of the manuscript. SY, JL supervised the methodology, analysis and critically revised the manuscript. RD and RP critically revised the manuscript and provided feedback.

Chapter #7

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Chapter #8

MN conceived the idea, defined the objective, and led the design of the methodology, sampling, data collection, and data analysis approach, and wrote the original draft of the manuscript. SY, JL supervised

the methodology, analysis and critically revised the manuscript. RD and RP critically revised the manuscript and provided feedback.

Financial Support

This thesis was partially supported with an admission scholarship for doctoral students at the uOttawa. The Mobility bursary at Ottawa University partly supported the trip for data collection, and my supervisors also provided financial support to facilitate data collection. Quebec student loan assistance enabled completion of some aspects of data collection and article processing charges. Additional support was provided by the Bank of Montreal (BMO) scholarship and the Student Award from the Association of Professors of the University of Ottawa (APUO) and additional financial support from my family.

Chapter 1

Introduction

1. Preface: Organization of Chapters

This dissertation is a manuscript-based thesis that contain seven chapters presented as manuscripts already submitted for consideration by peer-reviewed journals. The introduction provides an overview of the performance-based financing (PBF) policy and the PBF equity elements and the operationalized strategies. This is then followed by an overview of the history of PBF, debate in the literature, and the main elements of the study (i.e., goals, objectives, methodology, and context). The introductory chapter, methodology, and frameworks applied in this study reflect the original thesis proposal document, which was approved by my thesis committee in February 2021.

Chapter 2 documents a published protocol for a systematic review of performance-based financing interventions on out-of-pocket expenses relevant to maternal health services in sub-Saharan Africa. It reports the investigation approach on the effect of one of the PBF equity elements in improving access to selected maternal services in sub-Saharan Africa. Chapter 3 reports the method and findings of the systematic review. Thus, these two chapters address the first objective of my dissertation and provide an overarching perspective and a broader understanding of the effect of one of the PBF equity elements in sub-Saharan Africa.

Chapters 4–8 focus on understanding the PBF equity elements in the context of Cameroon and are divided into three parts. The first part (Chapters 4 and 5) provides a broad picture and an understanding of the effect of PBF equity elements in the context of out-of-pocket (OOP) expenses (which is one of the equity elements) in Cameroon. Given the heterogenous nature of health care delivery in Cameroon, these chapters respond to the limitations of a previous PBF impact evaluation in Cameroon. Chapter 4 presents the methods and results of a before-and-after design that investigate the effect of PBF on OOP expenses for selected maternal services in Cameroon. Chapter 5 provides further insights (as a

behavior change mechanism) into the health-seeking behavior observed in antenatal care services and skilled birth delivery in a post-PBF setting.

Chapter 6 was initially designed to provide additional insights on the trend of the effect of PBF equity elements on selected maternal health services over time. However, because of the low quality of the data, such an initial design with interrupted time series analysis was not feasible, and therefore the chapter's design was modified to highlight the challenges of data encountered and possible solutions to address data gaps relevant to the assessment of PBF. These three chapters (4-6) address the second objective of my dissertation.

The second part, reported in Chapter 7, examines the definition and implementation process of the PBF equity elements in Cameroon, hence addressing the third objective of my dissertation. This chapter builds upon the gaps in the literature and draws on the findings obtained from Chapters 2–5. It also discusses a framework for understanding the definition, implementation approaches, and challenges of PBF equity strategies in Cameroon.

The third part, reported in Chapter 8, draws from one of the underlying theories of PBF policy- principal agent theory- to present the experiences of health care providers in implementing PBF policy as a new reform and its equity strategies, hence addressing the fourth objective of my dissertation. This chapter builds upon a previous study of my master's thesis in 2007, which was performed before the implementation of PBF to understand and highlight the subtle experiences of health care providers with the adoption of a new policy (PBF). It also highlights the potential sustainability of the PBF equity strategy, which is embedded within the PBF program.

Chapter 9 presents the key findings, limitations, methodological and field challenges, and conclusions of this study.

Each chapter is introduced with a brief preface, which describes the specific objective addressed, the contributions of the co-authors, the status of the manuscript, ethical approval where applicable, and appendices (where applicable). The appendices also contain information on ethics standards, recruitment

and consent processes, data collection tools, knowledge dissemination activities and other selected projects, grants acquired, and studies published, all during my Ph.D. project.

2. Background and Definition

Performance-based financing (PBF) is intended to improve health care in the most vulnerable and low- and middle-income countries [1-6]. It is designed to strengthen weak health systems, improve the quality of care, and increase health workers' performance—often defined in process or outputs [1-6]. PBF involves payment to providers for output, usually with predefined quality criteria and generally a form of trickle-down payment to individual staff within the health facility [1-6]. Some PBF programs also include demand-side strategies to enhance effectiveness using vouchers or equity funds, for example, in Nigeria [4], and some include social health insurance schemes, for example, in Burundi [4,7]. PBF targets health facilities with a conditional fee-for-service payment mechanism based on quality [1-8].

Several terminologies have been used to describe PBF. These are usually synonymous but sometimes ambiguous. For example, result-based financing has been used in some cases to describe PBF [4]. However, RBF encompasses the entire range of incentive approaches on both the demand and supply sides, which can be targeted at any level depending on the design [4,6]. Pay for performance (P4P) is synonymous with RBF and has been used in higher-income countries such as the USA, Canada, New Zealand, and the UK [9]. Performance-based contracting (PBC) involves the use of non-governmental organizations (NGOs), as in Afghanistan, and resembles PBF. However, the difference lies in the contracting with NGOs [10], while a PBF contract is with health facilities that can be public or private [6].

Given the various terminologies associated with PBF, the present study employed the comprehensive definition laid out in the PBF course manual:

“Performance-based financing is a system approach with an orientation [toward] results, defined as [the] quantity and quality of service outputs and [the] inclusion of vulnerable persons. This approach entails making facilities autonomous agencies that work for the benefit of health- or education-related goals and their staff. It is also characterized by multiple performance frameworks for regulatory functions, the contract development and verification (CDV) agency, and community empowerment. Performance-based financing

applies [to] market forces but seeks to correct market failures to attain health or other sector gains. PBF, at the same time, aims at cost-containment and a sustainable mix of revenues from cost recovery, government, and international contributions ... PBF is a flexible approach that continuously seeks to improve through empirical research and rigorous impact evaluations, which leads to best practices". [7. P.28]

3. History of PBF and the PBF Equity Instruments

The history of PBF can be traced in the 1990s with the experimentation of market forces in the primary health sector in Zambia [13]. In 2003, PBC was introduced in Afghanistan as a national health service delivery strategy -which involves contracting with NGOs [10,14]. In 2002, PBF was introduced in Rwanda [4,6,15], and a similar approach of the PBF policy was later introduced in the Democratic Republic of Congo [16] and in Burundi from 2006 onward [4,17,18]. In 2008 and 2009, small, pre-pilot PBF programs were introduced in Cameroon and Indonesia, respectively [4]. From 2013 onward, additional PBF programs were introduced to a wide range of low-and-middle income countries (LMICs), including Cameroon, Nigeria, and Benin [4]. Forty-five LMICs have implemented PBF (Appendix V), of which twenty-six countries are in sub-Saharan Africa [4,7].

The design, implementation, and evaluation of most PBF programs are supported by the World Bank and financed by the International Development Association and the Health Results Innovation Trust Fund [4,11]. This funding is based on each country's context and health care sector priorities, and all programs are accompanied by a rigorous impact evaluation [4,11,19,20]. Earlier PBF designs (before 2010) were criticized as lacking equity consideration [7]. The PBF equity instruments was therefore introduced in 2010 to address the criticisms of earlier designs and support progress toward achieving universal health coverage (UHC) [4,7].

PBF equity instruments are summarized as equity designed elements and presented in Table 1.1 and operationalized in one or more of the following strategies: i) choose services that are under used by the poor, ii) paying providers more to reach out to poor women, iii) selecting services used by the poor, iv) subsidizing user fees to reduce out-of-pocket expenses, v) adding complementary demand services, and vi) using community health workers to address information and social barriers [4,7]. These PBF equity

design elements constitute one of the areas where PBF intersects with UHC; that is, “expanding the coverage of health services for the general population, especially for the poorest” [4,7]. Based on the equity design elements listed below, it is obvious that the goal of including equity elements is to ensure the poorest population can access services and are not left behind. Therefore, one of the objectives of this dissertation was to examine how the PBF equity strategy is defined and implemented at facility and individual levels in Cameroon.

Table 1.1. PBF equity design elements and anticipated effect on equity as defined in the PBF manual

PBF equity design elements	Effect on equity and financial protection
1.Choose services that are underused by the poor	Increased use of the selected services by the poor.
2. Pay providers more for reaching a poor person than a non-poor person	Increased use by the poor more than the non-poor
3. Pay providers more for services delivered in poor areas	Increased use by people in poor areas more than by people in non-poor areas; more resources pushed to poor areas
4. Subsidize user fees	Reduced out-of-pocket costs, thus enhanced financial protection and increased use of services
5. Incentivize community health workers	Reduced information and social barriers for the poor
6. Add complementary demand side incentives	Reduced financial barriers (such as transportation cost and related expense)

Source: Fritsche et al., 2014[4]

4. Overview of Theories Behind PBF

It has been argued that there is no single theory that can explain the function of the PBF scheme given their complexity [8]. This is not surprising as the development of PBF has drawn from several theories: systems analytic, microeconomic, public choice, and new institutional economic [4,7]. These theories are well-known for decentralizing power between the demand and supply actors [7]. The systems analytic theory is advocated in solving complex problems, and public choice theory aims to explain the behavior of various actors in the public space and how these behaviors can be influenced to promote public interest

[7]. Within the area of microeconomic theory, contract theory presents the need for communication between the principal and agent to enable understanding and smooth implementation of the principal's expectations and the agent's ability to deliver [7]. This principal-agent problem is among the essential issues underlying the health systems in most LMIC [11,12], where the interests of the principal and agent are not necessarily aligned, given the centralized nature of health systems. PBF was viewed as a powerful tool to decentralize health systems, in principle addressing the principal-agent problem [6]. Given the complexity of the PBF schemes and the focus of this dissertation on the PBF equity design elements, this dissertation employs the principal agent theory to explore specific objectives.

Every PBF scheme is different. However, there are six fundamental components of PBF which are open to choice [8,11]: i) separation of health care functions, which is in the domain of governance arrangements—mostly between purchasers, providers, and verifiers, ii) using a matrix of indicators and quality measures to inform the implementation and evolution of PBF, iii) monitoring arrangements, iv) financial incentives and time schedules, v) dispute settlement mechanism(s) and vi) other components such as training workshops [1-8].

In general, PBF can be considered as the introduction of market principles where i) the health facility is paid for performance and the staff receive consistent and sufficient compensation intended to prevent them from seeking other sources of income, ii) clear targets and specific incentives are established through contracts between the stakeholders to improve the performances of facilities and staff, and (iii) increased access to resources to enable effective and efficient organization of facilities, requiring them to decide independently how to use their income[1-11]. Thus, PBF splits health care into different functions. Further, PBF promotes transparency, checks and balances, and clear mandates and responsibilities [1-11]. The local community is also empowered and involved, and their voices are heard through community engagement mechanisms, increasing the equality in the health services provided. In addition, it promotes access to the most vulnerable by providing additional incentives to health facilities serving poor and vulnerable populations, so addressing inequity concerns [1-11].

Within new institutional economics theory, the principal agent theory denotes a principal (considered as the actor) who delegates a task to an agent who receives a compensation for doing a task [8,12]. The theory proposed an establishment of a favourable contract between the principal and the agent that includes remuneration and sanctions [8,12]. It is assumed that both parties are motivated by material and financial incentives [8,12]. There is information asymmetry as the agent is usually more knowledgeable than the principal [8,12]. Principal agent theory recommends linking incentives with some measure of performance and it is this linking of incentives to measures of targets (outputs or outcomes) that makes the theory a useful basis for analysing PBF [8,12]. While there has been some criticism of the principal agent theory, based on limited empirical validation [8]. This dissertation employs this theory to explore one of the objectives with consideration on the structure of the health system in Cameroon.

5. Controversies and the Debate on PBF Reform

PBF was conceptualized by promoters from the North as a health system reform for LMIC, but this conceptualization has been viewed as a form of neo-liberalism applied to the health systems in the global South [19]. The rapid expansion of the PBF policy in LMICs over time can be termed as a “wind of change” in their health systems. This “wind of change” has resulted in much discourse and debate amongst experts and policymakers, with concerns about transferring such a complex policy, i.e., PBF, from developed countries to LMIC without proper evaluation of the experiences [19]. However, some argued that the centralized nature of health systems in LMICs and the reliance on central government and the ministry of health in fulfilling the functions of the health system required a policy such as PBF to enable the decentralization of such a system and improve the responsiveness of health facilities towards the user, boost staff motivation, enhance stewardship, and address geographic inequities [18].

The debate in the literature on PBF is wide-ranging, including policy issues and drivers. There is a debate whether PBF is responding to local needs and conditions, or if it is another form of donor financing mechanism and external intervention [5,16-19,21]. There are concerns regarding whether PBF adaptation to context is flexible and whether the adaption suits the different situation or context, or

whether it is merely copied and pasted across context [5,16-19,21]. There are issues regarding implementation concerning how PBF is planned and designed versus the reality in terms of specific structures and context and potential gaps between the plan and reality in the implementation.

There is also debate concerning the impact on health systems regarding whether PBF establishes parallel financing mechanisms or whether it strengthens health systems or offers modification strategies that are equity-augmenting or enhancing [5,16-19]. There is controversy about equity strategies and the frequent focus on primary health care, and some argue that this tends to reward high performance which could be at the expense of equity. There are issues concerning efficiency that have been discussed: PBF offers a means to leverage the system by adding small incremental amounts; however, it may be a costly mechanism that is unsustainable [19].

There is uncertainty as to whether PBF results in improved quality of care. Although most of the design orients toward improving the quality of care, some have argued that the bulk of the funding pays for the volume of services that are already used and delivered [16-19]. It has been suggested that PBF may be ineffective because it becomes an output-oriented approach and this raises questions regarding whether the aim is to generate output within health systems or improved outcomes [5,16-19]. This aspect of outputs and outcomes is also linked to the effectiveness debate, which focuses on whether outputs or outcomes are funded [5,19].

The mechanism of change is another area where, even if it is known what PBF does and change is achieved in terms of outputs or outcomes in the system, there is a debate on what is driving that change. The possible drivers are that the PBF scheme brings additional resources to an under-resourced setting, clarifies the roles of the players, increases local autonomy, builds skills, or better feedback loops for performance [16-19]. There are also tensions around autonomy and control; PBF emphasizes autonomy and empowerment but has a microstructure – the setup and operationalization also create such tensions [16-19]. There is also a debate on sustainability as most of these schemes are still largely financed by donors, and the concern is not only about financial sustainability but also the capacity to sustain the reform and address risk produced by PBF [9,17,19]. In West Africa, some of the countries that

implemented PBF discontinued the program when donor funding was withdrawn, for example, Benin, Sierra Leone, and Mali [19,24]. Countries such as Cameroon, Rwanda, and Burundi, however, have reached scaling at the national level with domestic support [19,24].

Over the last decades, PBF has expanded rapidly and is mainly common in fragile settings, where about 56% of PBF programs are implemented in fragile and conflict affected settings including Cameroon [22-24]. PBF proliferated widely and rapidly in fragile states, with apparent paradoxes – PBF is a complex financing instrument in terms of its architecture, and it is unsuitable in settings where the institutions are relatively weak [9,17,19]. However, it is argued that in relatively loose states, it is possible to introduce such contractual arrangements with relatively few interest groups to oppose them [22-24].

6. Study Context

The present study is focused on selected maternal health services in Cameroon. The choice of country was motivated from logistic considerations and, as Cameroon is my country of origin, there is a better understanding of the health system and issues, and this also links with my master's thesis which was conducted in Cameroon in 2007. The choice of topic is based on the focus of the PBF policy in question and the burden of the issue of maternal mortality in Cameroon and sub-Saharan Africa at large. Most importantly, the choice of the specific studied indicators is driven by the limited progress made in the past two decades in the efforts to improve maternal health in Cameroon.

Cameroon is a lower-middle-income country with a population of approximately 26 million as of 2020 [25,26]. The health system has a pyramidal structure comprising the operational, regional, and central levels. The health policies are defined at the central level by the Ministry of Public Health, the regional level translates the health policies into operations, and the district level operationalizes the health policies into action. Health care is delivered in both public and private sectors. The public sector is operated by the government, the private sector is made up of confessional health facilities (Faith-based organizations, for example Catholic, Presbyterian and Baptist), private for-profit facilities (usually owned

by individuals). Para public facilities are public private partnership and the traditional healers. These sectors have different organizational cultures, and the cost of care varies by sector.

Based on a Ministry of Health assessment in 2012, the country has 1,888 public integrated health centers, 760 private health centers, 155 subdivisional health centers, and 164 district hospitals (27). In 2014, the maternal mortality rate was 590 per 100,000 live births [25,26,28]. Skilled attendants were present at 64% of births, a proportion that remained unchanged in 2018 [25-27]. In 2019, the country's GDP was approximately \$39 billion and the GDP per capita was \$1,502 [25,26,29,30]. The proportion of the GDP spent on health care was 3.6% in 2019[30], which is lower than the annual budget recommended at the Abuja Conference of 2001 [31]. At this conference, African member states recognized the prevalence of HIV/AIDs, and other related infectious diseases. The high incidence of maternal to child transmission, and the vulnerability and exposure of women and adolescent girls and their gender roles. Thus, member states pledged to allocate at least 15% of their annual budget to the health sector [31]. Therefore, the GDP spent on health care in Cameroon is questionable in an effort towards achieving universal health coverage and the sustainable development goals.

The public budget favored central-level administration and tertiary care, with less than 10% of the budget allocated to the operational level [32]. The operational level receives a small fraction of this health budget, with most of these resources allocated to administration and infrastructure [32].

The difference between the poorest quintile in accessing two or more antenatal care visits (ANC) and the rich is about 80% in Cameroon [25-29]. This difference in accessing maternal care services has been attributed partly to the introduction of user fees in Cameroon [33,34], which resulted in an out-of-pocket per capita expenditure of up to 72.5% [25,26]. This out-of-pocket expenditure poses a substantial barrier to accessing health care in Cameroon and sub-Saharan Africa at large—this hampers progress towards achieving universal health coverage and the sustainable development goals [35-38].

Specifically, the inefficiency regarding financial resources and the centralized nature of health systems are reported as problematic in Cameroon [39]. The challenges faced by the Cameroon health

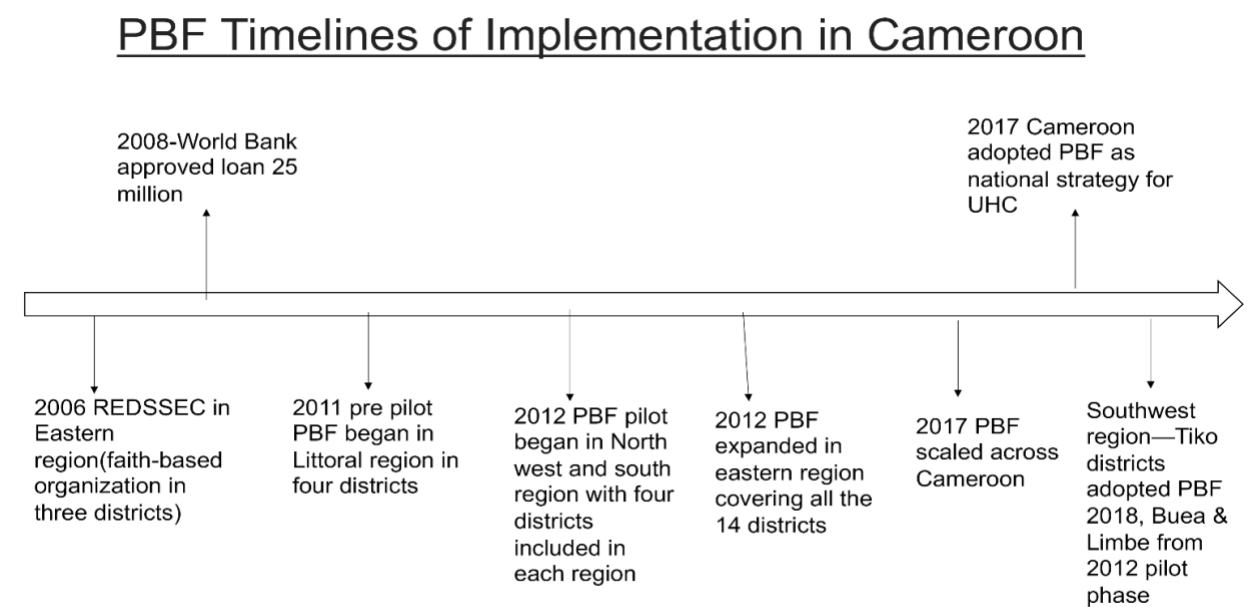
system are summarized as follows: i) high out-of-pocket expenses, ii) poor quality of care, iii) proliferation of private for-profit health facilities and difficulty in regulating them, iv) poor accountability, and v) limited qualified human resources for health [39]. Some of the reasons proposed for introducing PBF in countries such as Cameroon is based on the need to improve governance and accountability, address high OOP expenses, and improve maternal and child health in general [39].

6.1 Overview of PBF in Cameroon and Timelines

PBF was first implemented in the Eastern region of Cameroon in 2004 by the Catholic Organization for Relief and Development Aid in Catholic health facilities in three dioceses [35]. The project ended in 2012 with promising results [28,38]. In 2008, the World Bank approved a US\$25 million loan to the government of Cameroon through the Bank's Health Sector Support Investment Project (HSSIP) [31,38,39]. In 2011, through support from the HSSIP, a PBF pre-pilot program was initiated in the Littoral region of Cameroon, covering four health districts [26]. In July 2012, the program was expanded to the Northwest and Southwest regions of Cameroon and all the districts in the Eastern region [31,36]. In 2011, 26 health districts implemented PBF in Cameroon as shown in figure 1.1 below. In 2017, an impact evaluation was published, including a total of 26 health districts [31]. Of the 26 districts, eight are from the North and Southwest regions [31].

Cameroon adopted PBF as a national strategy for achieving universal health care in 2017, with implementation being rolled out in the remaining 155 health districts from 2018 to present. PBF is implemented in all the health facilities without discrimination, irrespective of whether they are private, public, para-public, or confessional. The PBF program in Cameroon is focused on maternal and child health and communicable diseases with a particular focus on the poor and vulnerable and people living with HIV/AIDS [38-41]. The present study was conducted in three districts (Tiko, Limbe, and Buea) from the Southwest region; two of the districts (Limbe and Buea) were included in the impact evaluation [31] and the third district (Tiko) enrolled into PBF in 2018.

Figure 1.1. Times of PBF implementation



The administrative and technical aspects of the PBF program in Cameroon are managed at the regional level by the Contracting Verification Agency (CVA). These are autonomous entities that have a contractual relationship with the Government of Cameroon, which entrust the agency with contracting the health facilities, verifying the data declared by the health facilities, and managing the funding intended for health care providers through PBF [31,40]. All PBF health facilities are expected to sign a performance contract issued by the CVA. This contract describes the conditions required to obtain PBF subsidies. The requirements include efforts to improve management, minimum quality level, governance, financial inclusion, and clauses for contract termination [40].

CVA ensure health facilities have suitable business plan that permit them to sign a contract. The Ministry of Public Health manages the regulatory aspect. This includes health facility enrollment into the PBF program, administration, and accreditation; ensuring health workers meet standards; and enforcing measures for not meeting quality standards or not enrolling in the PBF program.

7. The Problem and Scope of the Thesis

With the rise in PBF as a health reform strengthening resource-challenged settings with an equity component, which aim to address financial inaccessibility, especially amongst the poor and vulnerable population, few studies have studied the effect of PBF on equity [42]. There is a significant research gap regarding how this PBF equity elements is defined in various settings and implemented in various contexts [42]. According to the World Bank, successful implementation of PBF program should at least improve health care use; however, making a difference to the poorest population is of more concern.[4] Therefore, if the PBF program does not achieve this, its design and implementation arrangement should be carefully examined to determine where changes could be made [4].

Most of the countries implementing and upscaling PBF have done so without considering the result of an impact evaluation [43]. There is also controversy regarding the mixed results generated by randomized control trials (RCTs) of PBF programs [43,44]. Some have argued that the results are mixed due to the misuse of experimental methods [43]. For example, as noted by Abimbola 2020, actors who perceive PBF as a decentralization process argue that decentralized governance is an ongoing process involving tensions and continuous negotiations; thus, evidence generated regarding its effectiveness will be time-dependent [43]. Additionally, most impact evaluations are designed to estimate the average effect, which could potentially mask important heterogeneity across health care sectors, service users, and providers [44,45]. Moreover, RCTs are limited in generalizing results, and impact evaluations cannot provide evidence concerning whether countries should adopt PBF or what type of PBF should be adopted [43,44,45].

Specifically, in Cameroon, one expectation of the PBF impact evaluation was that PBF would improve access to and the use of maternal services, such as antenatal care and skilled birth delivery [32]. This was prioritized in the PBF impact evaluation objectives [32]. However, the results suggested otherwise, as the use of antenatal care (ANC) visits and skilled birth deliveries did not increase [32]. The lack of impact on these two indicators (antenatal care and skilled birth delivery) in Cameroon over the past two decades has caused concern, and this remains a major concern, as reported in the impact evaluation report [32].

The impact evaluation did not assess the effect on equity, and no study has been conducted in Cameroon to understand how the PBF equity elements are defined and implemented. Given the heterogeneous nature of health care delivery in Cameroon, important differences in health-seeking behavior, and women's tendency to "shop around" has been reported as a concern, which was not directly influenced by the introduction of the PBF but impacted the use and quality of care [32,46]. Moreover, the results of the impact evaluation did not generate a differential analysis based on health sector --which is an aspect of equity. This also presents a gap in reporting and does not reflect the actual context, given the important role each of these sectors play in delivering health care in Cameroon. Additionally, adopting PBF as a national strategy towards achieving UHC requires an understanding of how the PBF equity elements are defined, implemented, and the impact on access and utilization of maternal health services across sectors.

This significant research gap regarding the definition and implementation of the PBF equity elements, and the effect on equity including efforts to implement universal health coverage provides the basis of this dissertation. Therefore, the goal of this dissertation is to generate evidence to inform national strategies and the PBF community in general on the implementation challenges of the equity strategies, impact on access and utilization especially amongst the poor and vulnerable and potential for sustainability. This dissertation focuses on generating evidence and policy implications for the PBF equity program's effect on access to and the use of antenatal care, skilled birth delivery, and family planning in Cameroon using multiple methods.

8. Thesis Goal and Objectives

This dissertation aims to investigate and characterize the role of PBF equity elements in improving access to maternal services, to understand how the equity element is defined and implemented in Cameroon, to generate a framework to identify gaps and challenges to inform policy relevant to PBF in general and specifically in Cameroon and thus guide further research.

The goal of this thesis directly addresses the sustainable development goals (SDG3 (health and well-being), gender equality (SDG#5), and enhancing equity (SDG #10) to identify gaps to support research and prioritize funding to achieve UHC and SDG.

The specific objectives to achieve this goal are as follows:

- i) To investigate the effect of PBF on out-of-pocket expenses intended to improve access to and use of selected maternal health services across health sectors in sub-Saharan Africa and characterize the gaps. Given that reducing out-of-pocket expenses is one of the PBF equity elements and OOP expenses are reported as a major barrier to accessing maternal health services in sub-Saharan Africa, one of the PBF equity design elements assumes that subsidizing user fees will reduce out-of-pocket costs, enhance financial protection, and increase the use of services.
- ii) To investigate and characterize a) the effect of PBF on each out-of-pocket item for antenatal care, skilled birth delivery, and family planning across health sectors in Cameroon and b) the health care-seeking behavior of women attending antenatal care and skilled birth delivery across health sectors in a post PBF setting.
- iii) To define, describe, and categorize the implementation of the PBF equity elements across health sectors in Cameroon and to generate a framework that will facilitate the identification and understanding of the gaps and challenges, in turn informing policy development that is relevant to PBF equity elements in Cameroon and PBF research on equity in other countries.
- iv) To explore the experiences of health care providers and PBF managers with the adoption of PBF and its equity policy in Cameroon and provide recommendations to inform the national strategy on the existing PBF equity program and its potential for sustainability as a policy instrument to improve access and utilization of maternal health services to achieve universal health coverage.

9. Overview of Methods and Frameworks Used in the Thesis

The methodology for the proposed research is a mixed-methods approach, involving the use of multiple theoretical frameworks and triangulation across and within objectives as shown in Fig. 1.3 below.

Triangulation is highly appropriate when the study or subject matter is complex, demanding, and contentious [47-49]; hence, it is suitable for evaluating PBF, given its contentious nature and complex intervention components, reflected by the heterogeneous findings of previous studies. This dissertation employed all four types of triangulations: (i) data triangulation, the use of heterogeneous data sources; (ii) theory triangulation, the use of more than one theory (or framework) in interpreting the data; (iii) methods triangulation, the use of more than one method to gather data; and (iv) investigator triangulation, the involvement of multiple researchers in interpreting the data [47]. Detailed descriptions of the methods are provided within each chapter.

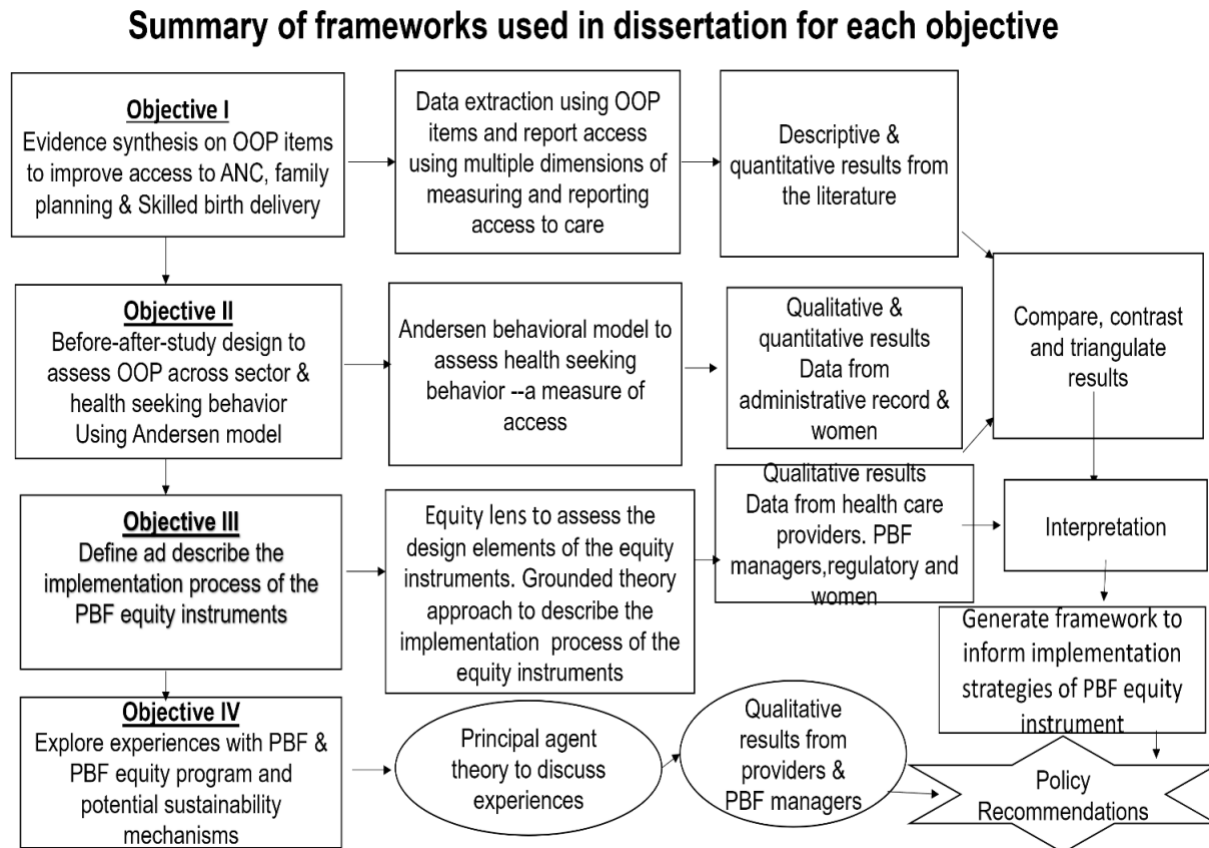
Figure 1.2. Thesis triangulation approach

The triangulation approach employed within and across objectives is as follows. **Methods triangulation**--involves the use of qualitative and quantitative methods for example, in-depth interviews and the use of a before-and-after study design. **Data triangulation**--involves the use of heterogenous data sources for example, survey, focus group discussions, in depth interviews and secondary data (administrative records) from health facilities, and, from private and public health sectors. **Researcher triangulation** based on co-authors who are members of my thesis advisory committee-- their interpretation of the findings from other perspectives to validate and extend on the existing research findings and to deepen and widen understanding [49]. **Theory triangulation** is the use of multiple frameworks (or theories) within and across objectives to widen understanding on the implementation approaches and challenges of the PBF equity strategies in improving access to maternal health services amongst the poor and vulnerable. Using multiple frameworks that are interconnected to the theories underpinning PBF as described above provides a broader understanding of the concept and implementation approaches. Triangulation also help to understand multiple perspectives in the issue and provide a more rigorous presentation of the findings to inform public health planning on PBF equity program across sectors in Cameroon and the PBF community at large.

This dissertation employed five frameworks. These frameworks are interconnected in understanding access and utilization of maternal health services which is a function of equity [51]. In addition, the frameworks provide a broader picture in understanding some of the theories behind PBF and provide an overview of how the variables can be explored to better understand equity in access for maternal health services within the context. The first involved the components defining out-of-pocket expenses [50]. This is more analytical and was used to disaggregate OOP expenses to provide a detailed picture of the cost of antenatal care and skilled birth delivery before and after PBF across sector, which is often presented in aggregated form. This framework was employed based on the PBF equity element (point 4) as listed in Table 1.1 above. The second framework was the Andersen behavioral model, which has been widely used in studying health service use [51,52]. This framework was used in two dimensions; the first was to understand the contextual and individual characteristics of health-seeking behavior of women in accessing

maternal health services with the introduction of PBF and how improving quality and changes in cost can stimulate behavior change [51,52]. The second dimension which is the third framework was based on the extension of the model regarding measuring and monitoring access. This aspect was used to understand the effect of the PBF assumption or policy intervention on improving access using the various dimensions of access—especially as access is a function of equity. The fourth framework was the PROGRESS-plus [53], an equity lens. This was mainly used to examine the PBF equity design elements and definition. Finally, the fifth framework, which is the principal agent approach, was employed to understand the implementation processes and challenges in introducing and adapting PBF as a national policy for achieving universal health coverage in Cameroon. The frameworks are described in each chapter as appropriate and summarized in Fig. 1.3 below. These frameworks also guided the data collection tools in Appendices A-E and data analysis approach.

Figure 1.3. Summary of frameworks applied in dissertation



10. Ethical Consideration

In the present study, I collected both primary and secondary data. For the primary data, I obtained ethical clearance from the Bruyère Research Institute and administrative clearance from the University of Ottawa. In Cameroon, I obtained ethical clearance from the Faculty of Health Sciences, University of Buea, and administrative clearance from the Regional Delegation of Public Health, Southwest Region (Appendices Q). All research activities, interviews, focus group discussions, and survey were conducted in accordance with the protocol outlined in the ethics application, and informed consent was obtained from all participants (Appendices O and P). I collected secondary data from health facilities and the district health information management system (DHIS2) with the permission of the health administrator of each participating health facility and of the district health team and regional delegation.

11. Reflexivity Statement

Maternal health remains a substantial challenge in sub-Saharan Africa and Cameroon. This challenge prompted my study, which coincided with the adoption of PBF, which is focused on improving maternal health delivery services in sub-Saharan Africa, by Cameroon as a national strategy. Growing up in a resource-poor setting like in Cameroon; observing the challenges faced by women, especially in rural areas, in accessing health services; and watching women die while giving life, made me recognize that improving maternal health is not just a concern but rather a need.

My Ph.D. study was strongly inspired by the need to design interventions to address the maternal health issues based on knowledge and skills acquired in my master's program, which focused on primary health care and improving the quality of primary health care systems and supporting such systems. I started conceiving and designing a digital idea as an intervention strategy to improve access to maternal health services, and to generate actionable data and improve on the quality-of-care delivery. While I was preparing to present my thesis proposal, my supervisor notified me that the digital health intervention idea that I had conceived is great but would require substantial funding. Though we submitted for funding, I was advised to rethink of a smaller project or streamline the idea. Therefore, I redesigned my Ph.D. study as a small project, a decision that I consider to be a timely one because this is when Cameroon had started adopting the PBF program. While reviewing the PBF impact evaluation report for Cameroon, I identified some gaps in reporting in relation to the equity elements of the PBF program. Given that Cameroon had adopted this policy with limited research evidence, I realized the need to investigate this policy to inform national strategies. However, after studying uninterruptedly for close to 3 years, I experienced some adverse health conditions myself, encountered difficulties in organizing fieldwork because of the global coronavirus pandemic, and faced other academic challenges, forcing me to skip nearly three semesters (a whole year). One whole semester was lost as I had to take a sick leave; another three months were lost because of some changes in my thesis committee and some adjustments to my thesis proposal, which

required a change in the study region and thus prompted a second phase of data collection; and another three months were lost as I had to take another sick leave because of further health-related problems.

12. Anticipated Outcomes

While performing this research as part of my Ph.D. program, my goal was to develop my professional capacity as a global health specialist and researcher. This program helped me improve my knowledge, methodological skills, and evidence-informed decision-making process to inform policies and practices. I supported the design and presentation of workshops on PBF at conferences. Engaged with a wider network of community of practice [54] for PBF--supported projects within the PBF community of practice and expanded my network with the PBF community at national and international level. My progress throughout this program is part of my career path. My thesis findings were further used to inform several strategies to engage national and international stakeholders while focusing on the elements of equity, data collection and disaggregation, and strategies in reinforcing health management information system to improve on the quality of maternal health delivery in Cameroon. They were also used to support some of the interventions aimed at achieving the vision of a digital health platform for the delivery of maternal care in Cameroon and sub-Saharan Africa at large.

During this journey, I used my knowledge, skills, and vision toward maternal health to support other projects. Importantly, I had the opportunity to inspire other researchers on the aspects of equity. I acquired grants and established a digital health platform (BornFyne-PNMS) [55] for maternal health with guidance from my thesis Supervisor and support from other colleagues. Further, I used findings from my thesis to inform intervention strategies for the BornFyne-PNMS project; developed approaches to engage relevant stakeholders at regional, district, and national levels; and promoted international collaboration between the University of Ottawa and the local implementing partners while engaging the ministries of health in Cameroon and Zambia. Some of the findings from my PhD thesis were incorporated into the BornFyne-PNMS project, which I had initially conceived as my Ph.D. topic but could not proceed with it because it required substantial funding. This project (BornFyne-PNMS) was later funded and currently

serves as one of my ongoing projects which I have managed to co-lead alongside my Ph.D. thesis over the past 5 years (from 2017) [55].

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Chapter 2

The Effect of Performance-Based Financing Interventions on Out-of-Pocket Expenses Intended to Improve Access to and Utilization of Maternal Health Services in Sub-Saharan Africa: Protocol for a Systematic Review and Meta-Analysis

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1. Preface

This chapter has been published. The chapter presents the protocol for a systematic review addressing the first objective of my dissertation. This chapter presents the steps I followed in conducting the systematic review to investigate the effect of PBF on OOP expenses in improving access to selected maternal health services. Subsidizing user fees by reducing OOP expenses can stimulate demand for maternity services, especially amongst the poor. I conceived the idea for the systematic review and led the design of this protocol and methodology. I developed the initial search strategy for the systematic review in collaboration with the research librarian at the University of Ottawa (Lindsey Sikora). Drs Yaya, Little provided valuable methodological expertise to inform the protocol, and Dr. Omonaiye critically revised the manuscript and informed the protocol subject matter. All authors read and approved the final manuscript published in BMC Systematic Reviews.

Status of the Manuscript: Published

Ethics Approval: Not required

2. Abstract

Background

Out-of-pocket expenses have been reported as a major barrier to accessing antenatal care and skilled birth delivery in most of sub-Saharan Africa. Performance-based financing (PBF) is one of several strategies introduced in lower- and middle-income countries to strengthen a weak health system. This review aims to synthesize evidence on the effectiveness of PBF interventions implemented with the objective of reducing out-of-pocket expenses and improving access to and utilization of ANC and skilled birth delivery and family planning in sub-Saharan Africa. It will consider evidence across health sectors and identify gaps in the evidence.

Methods and Analysis

This protocol is reported according to Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guideline. The systematic review will apply a three-step strategy to search five databases (CINAHL, PubMed, Ovid Medline, EMBASE, Cochrane.) and grey literature with the help of a librarian. Two independent reviewers will conduct screening to determine eligibility and critical appraisal of selected studies using the risk of bias criteria developed by the Cochrane EPOC Group and the New Castle Ottawa Scale for observational studies. The certainty of evidence for the outcomes will be assessed using “Grades of Recommendation, Assessment, Development, and Evaluation” (GRADE) approach. This review will consider experimental and quasi-experimental study designs and observational studies. Studies published in English and French language(s) will be included. Studies published since the introduction of PBF in sub-Saharan Africa will be included. Data will be collected on each item that contributes to out-of-pocket expenses. This review will adopt the Multiple Dimensions of Access Framework to organize the findings.

Discussion

This systematic review will support evidence informed data for the performance-based financing community and government by identifying, describing, and assessing the impact of performance-based

financing interventions on out-of-pocket expenses in promoting access and utilization of ANC, skilled birth delivery and family planning across health sectors.

Systematic Review Registration: This review has been registered with PROSPERO, Registration number CRD42020222893

Keywords: performance-based financing, out-of-pocket expenses, access, health sector, systematic review, maternal health services, antenatal care, skilled birth delivery, family planning, sub-Saharan Africa

3. Background

Health financing is a building block of the healthcare system, directed towards improving health outcomes, protecting people financially against the catastrophic or impoverishing cost of care and ensuring that healthcare services satisfy the population in need [1]. Health financing is important in the efforts toward improving health systems and targeting universal health coverage (UHC) [2]. One of the key elements of UHC is to improve the efficient use of financial resources [3]. Financial aspects have been reported as a major barrier to accessing antenatal care (ANC) and skilled birth delivery in most of sub-Saharan Africa [4-6]. These financial barriers amongst other factors have contributed to high rates of maternal mortality of up to 600/100000 lives birth in most countries in this region [4-7]. In an attempt to strengthen the weak health systems and address some of the above-mentioned problems, Performance-based financing (PBF) was implemented in many African countries with a focus on maternal health services [7]. This is done by paying providers according to the quality and quantity of services delivered for predetermined conditions [2-4,7,8].

Several terms have been used to describe PBF [6]. For instance, result-based financing (RBF) is utilized in some instances to describe PBF; however, RBF includes all incentives approaches for both demand and supply side perspective and may target any level of the health system based on the design. [8,9]. Pay-for-performance is synonymous with RBF and is often used in higher-income countries such as Canada, New Zealand, the United Kingdom (UK) and the United States (US) [9,11]. Performance-based contracting (PBC) involves the use of non-governmental organizations, as for example in Afghanistan; it is the same as PBF, but the difference is that, while PBF contracts with health facilities (either public or private), PBC contracts with non-governmental organizations [9,12]. PBF is a supply-side strategy, but to enhance their effectiveness, some PBF programs also include demand-side strategies that use vouchers or equity funds such as in Nigeria [9,12] or social health insurance schemes as in Burundi [7,8,12,13]. This review will use PBF as the operational term.

The focus of PBF is on maternal and child health services, with the goal to improve the quality and equity of coverage [2-3,10–13]. These equity elements include, but are not limited to, “subsidizing user fees and paying providers more for services delivered in poor areas to reduce out-of-pocket (OOP) expenditures, enhance financial protection and increase the utilization of maternal services to reduce inequity” [9,12–15]. OOP expenditures are defined as the direct payments made by individuals to healthcare providers at the time-of-service utilization [16]. This excludes any prepaid payment, notably insurance [16]. These OOP expenditures (also known as user fees) are usually categorized into formal and informal fees [9,16]. Formal fees are payments that are officially recognized and stipulated by the health facility and include fees for medications, contraceptives, laboratory tests, provider services, facility use and other expenses such as transportation [16]. Informal or unofficial payments are payments made more than official fees, also called “under the table” payments [12,16]. PBF is a supply-side strategy that pays providers incentives to change their behavior and stimulate demand for services, making services affordable [1,2,9,12]. One of the ways through which PBF can influence the use of maternal services is the effect on OOP expenses. Thus, PBF assumes that “subsidizing user fees to improve financial protection by reducing OOP expenditures will reduce inequities” [9]. This component of PBF equity design constitutes one of the areas where PBF intersects with UHC; that is, “expanding the coverage of health services for the general population, especially for the poorest” [9].

In some countries, positive impacts of PBF on maternal health services have been reported. For example, in Rwanda, increases in the proportion of women who had skilled birth delivery in health facilities and the quality of prenatal care were reported [17]. In the Democratic Republic of Congo, PBF improved the health provider’s effort to increase targeted service provision [18]. In Cameroon, PBF led to a significant increase in utilization (child and maternal immunization, family planning, HIV testing) [19]. However, limited impact of PBF, and/or potential increased inequity resulting from PBF, have also been reported. Indeed, in Cameroon there was no impact on skilled birth deliveries and ANC visits [19], and while PBF had an effect on informal fees, there was no impact on formal fees [19]. In Rwanda, although the PBF program did not increase inequities, it did not reduce them either [21,22]. In Tanzania, a

“potential pro-poor effect” on institutional deliveries was found amongst women in the poorest income subgroups [23,25]. Studies in Rwanda and Burundi reported pro-rich effects [13,24,24]. In Burundi, following implementation of PBF, there was a 4% increase for institutional delivery amongst the “rich” but no effect for the poor - this difference was statistically significant [13]. In Rwanda, PBF was found to be less effective in reaching the poor and favored the rich on improving access [24]. A Cochrane review on the effectiveness of PBF on the delivery of maternal health services studied several outcomes including ANC and skilled birth delivery and reported a mixed effect on institutional deliveries [26]. Some studies found an increase in institutional delivery, but other studies found no substantial increase [26]. The Cochrane review found both positive and negative effects on the utilization of ANC [26]. The review concluded that based on low quality studies, there was weak evidence to support any conclusion [26]. However, this review was conducted in 2011 when PBF programs in most countries were still undergoing impact evaluations; since then, some countries have scaled-up and institutionalized PBF. Thus, the Cochrane review requires an update. Our review will be focused on PBF effects on OOP expenses and across health sectors and will update some of the outcomes of the Cochrane review within the context of sub-Saharan Africa.

Health care delivery in most sub-Saharan Africa countries is largely delivered in both public and private sectors. The OOP expenses for maternal health services also varies by health sector. PBF intervention is implemented across all health sectors, but the results are usually reported in an aggregate form without consideration of heterogeneity across health sectors and within the OOP items. A systematic review on the effect of PBF on the quality of maternal services [27], reported on OOP expenditures as a secondary outcome with a focus on consultation fees. The review did not focus on specific components of OOP expenses and did not present results by health sector [27]. A systematic review conducted by James et al., 2020 focused on result-based financing schemes and the evidence on the level on which PBF has been scaled and/or institutionalized for maternal and child health services, but it did not focus on OOP items and health sectors [28]. These OOP items may be impacted differently with the implementation of PBF. However, typically, only OOP expenses overall are reported and the effect of PBF on each OOP

component has been overlooked. This constitutes a limitation in understanding where the implementation of PBF may need improvement with a view to reducing out-of-pocket costs, enabling enhanced financial protection and increased use of services.

Moreover, PBF interventions on user fees typically do not treat OOP expenses as an aggregate variable. Instead, each item that contributes to OOP expenses, for example, laboratory, echography, contraception, medication, and consultations fees, can be incentivised and/or purchased in different ways across health facilities and sectors. Given the important role that financial barriers play in accessing ANC and skilled birth delivery [4-6], and the effect of PBF on each of these OOP items, a major gap is the lack of an evidence synthesis on the effects of PBF on different components of OOP expenses, in particular, to improve access to ANC, family planning and skilled birth delivery across health sectors. Identifying the role those financial barriers play in accessing ANC and skilled birth delivery and family planning, and the role that each OOP item plays in determining the ultimate cost for ANC visits and skilled birth delivery, which also varies by health sector, will allow for a better and broader understanding of where the gaps are, and the system's failures related to OOP expenses. Such understanding will inform country level policies on ANC and skilled birth delivery adopted to achieve universal healthcare coverage and the PBF community at large on the interventions towards OOP expenses to improve equity.

This review will synthesize the effect of PBF on OOP expenses on access to and utilization of maternal health services across health sectors in sub-Saharan Africa. The aim is to produce a systematic review that identifies, describes, and characterizes the gaps on the effectiveness of implemented PBF interventions intended to change OOP expenses and increase access to and utilization of ANC, skilled birth delivery and family planning across health sectors in sub-Saharan Africa. The review will extract and describe each element that contributes to OOP expenses and characterise the gaps across sectors. If the review finds enough evidence to generate the effectiveness of those OOP interventions across health sectors, then, a meta-analysis will be conducted.

4. Defining Access and Measures

Several factors have been reported to affect the uptake of maternal services which can be categorized into structural barriers, financial barriers, and personal and cultural barriers [31]. Access to health care is a complex phenomenon defined in several ways. Andersen and colleagues defined access as the “actual use of personal health services and everything that facilitates or impede[s] their use” and as “not merely defined by the availability of services or health facility or resources but rather, if these services are actually being used by those who need them” [31]. The framework on access described by Andersen and colleagues identifies both contextual and individual factors as major determinants in improving access [31]. These contextual and individual factors are categorized into predisposing, enabling and need characteristics. This review will focus on the contextual and individual enabling characteristics as they directly facilitate or impede the use of services [31]. The rationale for using this framework is based on the interrelationship between financial aspects (OOP expenses) and the mediating role they have on access to, and the utilization of services and the desired outcomes [31].

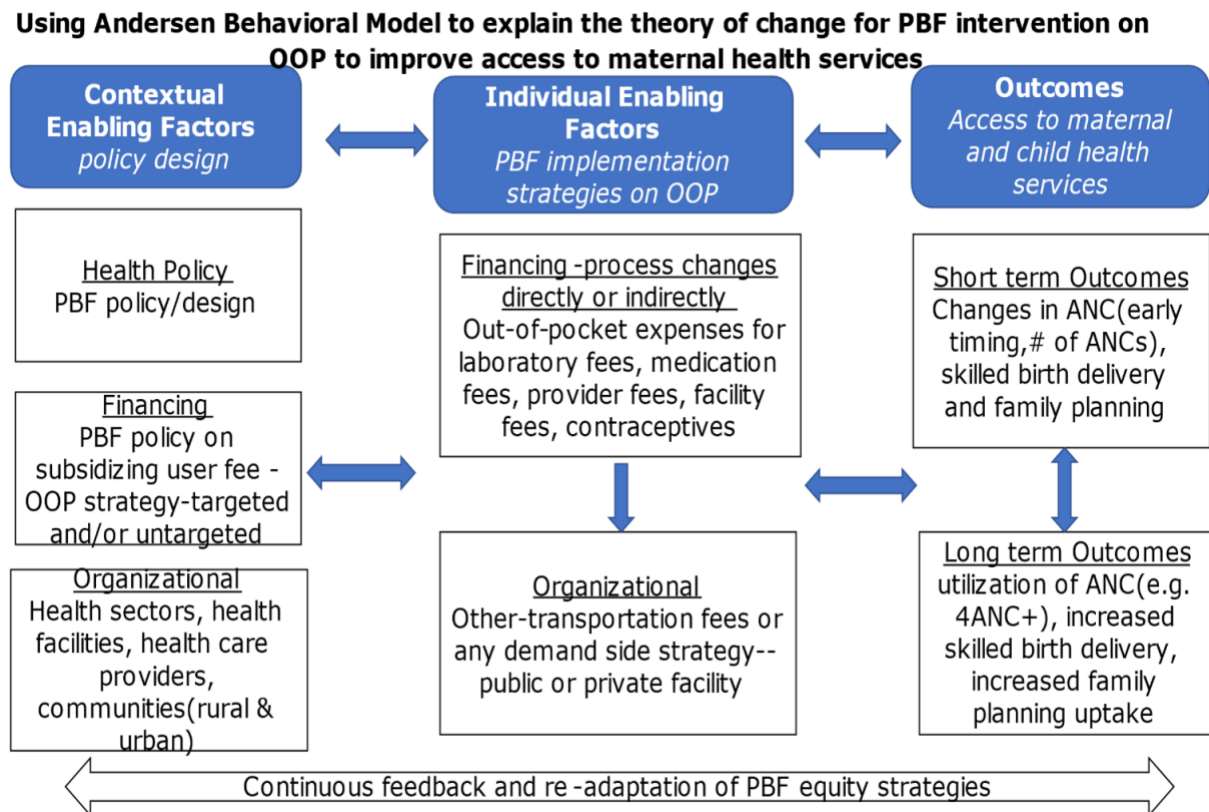
Table 2.1. Dimensions of access

Dimensions of Access	Definition from Andersen et al.	Application in Systematic Review
Potential Access	Health financing policy in place	Implementation of performance-based financing policy
Realized Access	Actual utilization of services as a result of the health financing policy	Utilization based on SR outcomes (ANC, skilled birth delivery and family planning) as reported in the study
Effective Access	Improving health status from health service use and is a function of potential and realized access	Changes in the outcomes in terms of utilization as reported in the study for example, timely use of services to improve health outcomes—attributed to the PBF policy
Equitable Access	Ensures distribution of resources based on need	Consideration of equity variables—income groups, place of residence and contextual differences in resource allocation as reported in the study
Inequitable Access	Focused on the process of reducing the influence of social characteristics on the distribution of health services	Consideration of approaches used to address information barriers amongst population groups as reported in the study
Efficient Access	To minimize the cost of improving outcomes as a result of health service use	Cost minimization for specific services (ANC, skilled birth delivery and/or family planning) to improve utilization and outcome as reported in the study

Source: Adapted from Andersen et al., 2013 [31]

According to the model, contextual enabling characteristics includes the health policy, financing mechanism and organizational factors [31]. The health policy in place, is considered as a policy instrument and a starting point to improve access, given its political importance [31]. Performance-based financing does not only raise political issues as a health reform, but also a financing mechanism intended to improve financial accessibility. Secondly, the financing aspect includes the available resources that can potentially pay for health services, and incentives to purchase or provide health services [31]. In this context, the targeted PBF policies (or incentives) on user fees or OOP for antenatal care, skilled birth delivery and family planning to improve access, and lastly, the organizational factor which defines PBF considerations on OOP expenses and how it is apply across all health facilities in both private and public health sectors and the targeted communities or population. The individual enabling characteristics includes financing and organizational characteristics. The financing characteristics are the cost of care or ‘effective prices’ and the availability of income for individuals to be able to purchase the services[31].Organizational characteristics is the support in terms of available means of transportation for individuals and/ or other support mechanisms within the organization [31].According to these authors, the financial barrier is one of the components of inequity while access is a measure of utilization [31].They categorized access into six dimensions to guide policy on improving and monitoring access. These dimensions include potential, realized, equitable, inequitable, effective, and efficient access as described in Table 2.1 above. It should be noted that we have included an adapted contextual description column in Table 2.1 to describe the approach we would use to explain the dimensions of access within the context of this review.

Figure 2.1. Andersen’s behavioral model



Source: Adapted Andersen behavioral Model In Kominski.F 4th Edition. (2013).

5. Theory of Change

PBF strives to improve access and the quality of maternal health care with special consideration on equity coverage [9,12]. PBF assumes that “subsidizing user fees and paying providers more for services delivered in poor areas in order to reduce OOP expenditures, it will enhance financial protection and increase the utilization of maternal services and reduce inequity” [9]. This review builds on the above PBF theory of change by applying Andersen et al.’s contextual and enabling characteristics of the behavioral model on healthcare utilization which assumes that the health policy in place, in this context, PBF policy on OOP has an effect on the delivery of care [31], as shown in Fig. 2.1 above. The way OOP expenses for ANC, skilled birth delivery and family planning are defined and implemented across health facilities and health sectors and within rural and urban settings has an impact on access and utilization of

ANC, skilled birth delivery and family planning. These contextual and individual characteristics can influence access in multiple dimensions. Thus, the review will discuss and categorize any changes in the outcome using the multiple dimensions of access as described by Andersen and colleagues [31].

6. Methods

6.1 Reporting and Registration

This protocol is reported according to the guidelines for preferred reporting items for systematic review and meta-analyses protocols (PRISMA-P 2015) Checklist (Appendix I) [29,30]. The systematic review will use a three-step search strategy with a minimum of 5 databases (CINAHL, PubMed, Ovid Medline, EMBASE, Cochrane.) and grey literature with the help of an information scientist. This review is registered with PROSPERO, the International Prospective Register of Systematic Reviews. Registration number CRD42020222893.

6.2 Inclusion and Exclusion Criteria

Population

The review will include health facilities in both public and private sector, health care providers, and pregnant women or household members attending antenatal care, skilled birth delivery and family planning that are being assessed within a PBF program.

Intervention(s)

This review will consider studies that evaluate any PBF intervention or strategy specifically designed to target any of the items that constitute OOP expenses as listed in the OOP item list below. PBF interventions can be at the community level, which may involve community health workers and health facilities. Specifically, it will investigate PBF OOP interventions directed at medical services for ANC, skilled birth delivery and family planning.

Interventions could also be demand-side financing, whereby, incentives are provided to health facilities and/or providers to achieve some level of standard and performance as expected for ANC,

skilled birth delivery and family planning [9,12]. Any demand-side intervention implemented as part of the PBF program on OOP items to ensure the effectiveness of the program will be considered. Demand-side interventions that were not included as part of the PBF mechanism for OOP or other national interventions will not be considered; they will be reported but will not be included in the synthesis (see Table 2.2 below).

Out of Pocket Expenditures Items

Out of-pocket expenses include direct and indirect expenses [16]. Indirect expenses are any form of informal fees while direct expenses are defined as follows [16]:

- i) Medication cost—includes all pharmaceuticals related expenses on routine drugs during ANC and skilled birth delivery
- ii) Contraception fees relates to fees for services like family planning, contraceptives methods, includes all fees paid for contraceptive
- iii) Clinical test includes services like Laboratory test, X-ray, echography etc., laboratory test during ANC especially ANC1 and or skilled birth delivery
- iv) Facility fees is usually collected for registration, consultation, or overnight stays
- v) Providers fee may relate to specialized care services by health care providers, for example C-section
- vi) Other — (may include transportation cost to facility),

We will not have any restrictions for the type of PBF intervention or strategy. There will be no limitations on length of follow-up of the intervention.

Comparators

This review will identify the studies that compared PBF intervention on OOP to an active or non-active comparator for example, comparators could be standard of care practice, other health interventions or

policies that are not directed by PBF, or novel comparators. No eligibility criteria will be made for comparators used.

6.3 Outcomes

The outcome for this review is access to ANC, skilled birth delivery and family planning, i) any PBF interventions on out-of-pocket expenses for ANC, skilled birth delivery and family planning, ii) any observed or reported changes on ANC, skilled birth delivery and family planning due to OOP changes as a result of PBF and across health sectors. The secondary outcomes will consider any PBF interventions on OOP on other maternal health indicators like maternal immunization and nutrition. Antenatal care visits will include ANC 1-4 visits and more where applicable. Skilled birth delivery includes community and institutional deliveries performed by an accredited trained professional [1]. Access will be presented using the six dimensions as described above in Table 2.1 [31].

For the outcome, we will include studies that measure ANC, skilled birth delivery and the use of family planning methods. These variables are defined above. Studies that will be included will be restricted to sub-Saharan Africa. Skilled birth delivery by a trained professional can be either in the hospital or at home. At this stage, in order to avoid bias, we will not restrict publication year and language. The following will not be included in the study, commentaries, perspectives, expert opinions, conference proceedings, editorials, book chapters. Publications that do not include full texts will be excluded in the review but will be included in mapping the evidence.

Table 2.2. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Presence of at least one comparison group	Studies with any comparator
Published from 1990 to 2020 since PBF started in the 90s	
Interventions at facility or provider	PBF intervention policies on OOP without concrete description of implementation at facility level or point-of-care will be included for reporting purposes but will not be included in the final synthesis
Studies in sub-Saharan Africa	Studies in LMIC without disaggregating results separately for sub-Saharan countries will not be included in the final synthesis, but will be reported
Study reporting effect change, or any changes observed as a result of the PBF intervention on OOP and statistical significance of the intervention	Studies that do not disaggregate the reporting of OOP items will not be included in the final synthesis, but they will be reported separately
Study assess PBF intervention (or demand side) on at least one item that constitutes out-of-pocket expenses	Study is not focused on PBF intervention in relation to out-of-pocket expenses
Study assesses at least one outcome of interest that is ANC, skilled birth delivery, or family planning	Study assesses other maternal services but does not assess any one of the outcomes listed will
The study quantitatively evaluates the effect of any PBF interventions	Study is a qualitative and/or does not evaluate the impact of PBF intervention
Study clearly describes the PBF intervention on the specific OOP expenses and provides details on the outcome	Studies that only describes PBF intervention on OOP without providing effect on the outcomes will be included for reporting purposes but will not be included in the final synthesis

6.4 Study Design

This review will include impact evaluations and observation studies of PBF interventions directed towards OOP for antenatal care, skilled birth delivery and family planning across health sectors. The following study designs will be considered for this review, experimental and quasi-experimental study designs, and observational studies. Thus, we will include randomized and non-randomized controlled trials, before and after studies and interrupted time-series studies. For observational studies, we will include prospective and retrospective cohort studies, case-control studies and cross-sectional studies.

6.5 Search Strategy

The review will search five databases (Ovid Medline, CINAHL, PubMed, Cochrane, Embase), including CABI Global Health (Ovid). The search terms will be developed in consultation with an information specialist. We will combine the search terms for PBF and sub-Saharan Africa. We will develop the search criteria initially in Ovid Medline and additional searches will be adapted from the initial search strategy and tailored according to each database. Grey literature will be searched from the following databases: World Bank e-library for PBF impact evaluations, Epistemonikos database, Department for International Development (DfID's) research outputs database and the ELDIS development database (eldis.org). Citation searches of included studies will be run using Google Scholar. The reference list of all studies selected for critical appraisal will be screened for additional studies. Studies published in English and French language(s) will be included. Studies published since the introduction of PBF in sub-Saharan Africa will be included, that is since the 1990s.

6.6 Data Management

The search results will be exported into Endnote for data management, such as duplication removal, and referencing. After removal of duplicates, data will be exported into Covidence [32] for screening and data extraction. Subsequently, data analysis will be conducted and depending on the possibility of conducting a meta-analysis, data will be exported into review manager (RevMan) [33] for further analysis.

6.7 Study Selection Process

The review process (screening, eligibility, inclusion, and meta-analysis) will be conducted independently by the two reviewers using Covidence. The titles and abstracts will be screened by the two independent reviewers using the inclusion criteria for the review. Studies that may meet the inclusion criteria will be retrieved in full during full text screening. The full text of the selected studies will be retrieved and assessed in detail using the inclusion criteria. Full text studies that do not meet the inclusion criteria will be excluded and the reasons for exclusion will be listed in the final systematic review report. Papers will be retained for full-text screening when there is uncertainty about the eligibility of a paper at the initial screening stage. The results of the search will be reported in full in the final report and presented in a

PRISMA flow diagram. Any disagreements that arise between the reviewers will be resolved through discussion, or with a third reviewer. Understanding of the inclusion and exclusion criteria will be assessed through calibration of a small number of studies strictly adhering to the PICO criteria. Any disagreement will be resolved through consensus, if consensus is not achieved, a third reviewer(co-authors) will be consulted. If a study has multiple publications, the most recent one will be retained. At this stage, language will be limited to French and English. Similarly, at this stage, we will limit the scope to sub-Saharan Africa and we may limit the publication year depending on the nature of interventions and number of studies.

6.8 Data Extraction

Data will be extracted from papers included in the review using the data extraction tool adapted from the data extraction tool developed by the Cochrane EPOC Group [34]. The data extraction form will be validated by the team on the data variables to be extracted. The data extraction will be done by the two independent reviewers. The data extracted (which will incorporate elements in Fig.2. 1) will include specific details about study characteristics, study participants, intervention details, study design and methods, outcome details, intervention effects, data analysis, consideration of equity dimensions, category of access measures for outcome variables and context characteristics. See Table 2.3 below for additional information on data extraction. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. Authors of papers will be contacted to request missing or additional data where required.

Table 2.3. Data extraction tool

Dimensions	Details	Additional explanation as applicable
General information	Authors, year, country of study, language,	
Study characteristics	aim of PBF intervention, PBF program, health financing mechanism before PBF, study design, aim of the study, health system structure (private and public sector), level of scale of PBF by country, data source, methods	
Study participants	Description of study population, characteristics of study participants, recruitment strategies, sample size calculation	
Intervention details	Out-of-pocket items, description of the intervention, intervention groups, number of interventions and the timing	Any of the 6 out-of-pocket items, medication, laboratory, contraception fee etc. and by health sectors
Data analysis	Nature of analysis conducted and statistical test, control for confounders	
Outcome details	Type of outcomes, ANCs, skilled birth delivery, family planning	
Intervention effects	Baseline and post PBF results, effect estimates and subgroup analysis estimates, secondary outcome effects	
Equity dimensions	Consideration of equity elements	Any of the following considered in the intervention to reduce OOP, rural or urban setting, occupation, education, income status
Category of access measures for outcomes	Potential access, realized access, equitable access, inequitable access, effective access, efficient access	As described in table 2.1
Context characteristics	Political setting, conflict setting, non-conflict setting, stage of PBF program (pilot, scale, institutionalized stage)	

Source: Adapted from Cochrane EPOC Group 2017

6.9 Quality Assessment and Risk of Bias

All selected studies will be critically appraised by two independent reviewers at the study level for methodological quality in the review using the risk of bias criteria developed by the Cochrane EPOC Group [34]. This tool is based upon the Cochrane Collaboration risk of bias tool [35]. The tool provides advice on assessing the quality of the methodology for randomized control trials, evaluating risk of bias

including randomization, quality of randomization, allocation concealment, level of blinding, masking, and losses to follow-up. Studies will be assessed based on selection bias, performance bias, detection bias, attrition bias, reporting bias, and any other sources of bias. The rating for bias will be reported as “high”, “low” or “unclear” [35]. Any disagreements that arise will be resolved through discussion, or with a third reviewer. The Cochrane Collaboration recommends the same tool can be applied at minimum, to evaluate risk of bias in non-randomized studies [35]. However, the Newcastle Ottawa Scale has been reported to be the most useful for systematic reviews for non-randomized studies [36,37], but the variations in non-randomized study designs makes it difficult to apply [35,37]. We will critically appraise the studies while applying the above tools and look for potential confounding and evaluate how the authors have adjusted for confounding, and how they have considered the items in reporting observational studies. Studies in which the intervention or outcomes are not well described by the authors, or in which data are not presented in a way that can be extracted, will be excluded; a list of excluded studies, with reasons for exclusion, will be presented as an appendix to the report. Publication bias will be assessed using funnel plots and visual inspection [35]. Any disagreement during risk of bias assessment will be resolved through consensus and if unable to come to a consensus a third reviewer will be consulted.

6.10 Data Synthesis

The data that is collected from included studies will be tabulated and summarized narratively. We will begin with a descriptive review (incorporating elements of the theory of change in Fig.2.1). We will describe the characteristics of the included studies which will include the population, the types of studies, PBF program, objectives, health sectors and health financing mechanism, country, methods, and main results. PBF intervention strategies that have been implemented to improve OOP expenses will be categorized and described according to each OOP item--- medication, clinical test, contraception fees, provider fees, facility fees and other fees. A narrative description and structured synthesis will be used to present the intervention effect on the outcomes on access to ANC, skilled birth delivery, and family planning using the dimensions of access as defined above.

Papers will, where possible, be pooled for meta-analysis using RevMan [33,35]. The outcomes results can be presented as immediate change and/or change in trend before-and-after PBF. Effect sizes will be expressed as either odd ratio (for dichotomous data) and standardized mean differences (for continuous data) and their 95% confidence intervals [35,36]. Heterogeneity will be assessed through visual inspection of forest plot and statistically using the standard chi square, and I square tests (I^2) [38,39]. The choice of model will be random effect model as we expect that most of the studies will present a heterogenous population. Subgroup analyses will be conducted where there is sufficient data to investigate heterogeneity across health sectors and groups. If we find low-quality studies or studies that are evidently different from the rest, a sensitivity analysis will be conducted. In the case of a missing statistical data, we will contact the authors by using the corresponding address. Authors will be contacted, maximum twice, before we conclude as a missing data. Where statistical pooling is not possible, the findings will be presented in narrative form including tables and figures to aid in data presentation where appropriate. A funnel plot will be generated to assess publication bias if there are 10 or more studies included in a meta-analysis [35]. If there are enough studies with quantitative measures on ANC and skilled birth delivery and consistency in the direction of effects with low variation, a meta-analysis will be conducted.

The certainty of evidence in aggregate for all the outcomes will be assessed using “Grades of Recommendation, Assessment, Development, and Evaluation” (GRADE) [35,39]. We will rate the certainty of the evidence using the summary of findings table and assess risk of bias, inconsistency, indirectness, imprecision, and publication bias for the outcomes [35,39,40]. We will use the Cochrane EPOC Group summary of findings table to present the rating in GRADE [40].

6.11 Interpretation and Reporting of Review Findings

We will use the PRISMA flow chart to present the screening process, giving justifications for exclusions at each level of the flow chart. The synthesized evidence will be presented according to clinical and methodological components, as well as presenting summary narratives and forest plots. We will apply the

AMSTAR 2 tool - a critical appraisal tool used in assessing the methodological quality of systematic reviews [41] – as we develop our work to ensure that we maximize quality. The final review will be reported according to the PRISMA guidance [30].

7. Discussion

With the rise of PBF as a health reform in health system strengthening and the introduction of PBF equity instruments as a strategy towards achieving UHC. This systematic review will support evidence informed data for the PBF community and government by identifying, describing, and assessing the impact of PBF interventions on OOP expenses in promoting access and utilization of ANC and skilled birth delivery across health sectors. This review will synthesize the evidence on the effect of performance-based financing on OOP expenses which is one of the instruments listed in the PBF equity program and provide recommendations on access and utilization of antenatal care, skilled birth delivery and family planning across health sectors in sub-Saharan Africa. The review will discuss the findings in relation to the multiple dimensions of access and characterised the gaps to inform policy and research.

8. Limitations

This review will only consider studies published in English and French. This review may also suffer from publication bias given that most of the existing literature may include mostly studies that report positive outcomes [27].

9. List of Abbreviations

OOP: Out-of-Pocket

ANC: Antenatal care

GRADE: Grade recommendation assessment development and evaluation

PRISMA-P: Preferred reporting items for systematic review and meta-analysis protocol

AMSTAR: A critical appraisal tool used in accessing the methodological quality of the systematic reviews

Declarations

Ethic approval and consent to participate.

Not applicable

Consent for publication

Not applicable

Availability of data and materials

Not applicable.

Conflict of interest

Authors declared no conflict of interest

Funding

Authors have no funding to declare.

Author Contribution

MN conceived the idea for the systematic review. MN led the design of the protocol and methodology, devised the search strategy for the review and wrote the first draft of the manuscript. SY & JL supervised the design of the protocol and methodology and critically revised the manuscript. OO provided input on methodology and subject matter. All authors reviewed and approved the final draft.

Acknowledgement

The reviewers would like to thank Lindsey Sikora, Health Sciences Research Librarian at the University of Ottawa, for her support and guidance throughout the search strategy for this systematic review.

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Chapter 3

A Systematic Review of the Effect of Performance-Based Financing Interventions on Out-of-Pocket Expenses to Improve Access to, and the Utilization of, Maternal Health Services Across Health Sectors in Sub-Saharan Africa

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1. Preface

This submitted manuscript reports on the systematic review as described in Chapter 3. This chapter addresses the first objective of the dissertation, and it is linked to chapter 2. The chapters report on the methodology and findings of the review as described in chapter 3 and some modifications from protocol are also reported in the chapter. I conceived the idea for this systematic review and led the design of the protocol and methodology. I developed the search strategy in collaboration with the research librarian at the University of Ottawa (Lindsey Sikora). I screened all study titles and abstracts with a second reviewer (OO) from Deakin University Melbourne, Australia. I screened all full-text studies with OO. I conducted risk of bias and GRADE with the second reviewer (OO). I led the data interpretation with inputs from all the co-authors. I wrote the first draft of the manuscript. Drs Yaya and Little supervised the design and methodology and critically revised the manuscript. Drs Pongou and Deonandan provided valuable methodological and subject matter expertise to inform the review and revised the manuscript. All authors read and approved the final manuscript, which has been submitted to BMJ Global Health.

Status of the Manuscript: Submitted to BMJ Global Health

Ethics Approval: Not required

2. Abstract

Introduction: Performance-based financing (PBF) assumes that subsidizing user fees for maternal health services to reduce out-of-pocket expenses will expand coverage and reduce inequities in access to maternal health services. PBF is usually associated with process changes and the idea that increasing a facility's resources from PBF interventions can improve the availability of equipment, drugs, and medical supplies at the facility, has an indirect effect on out-of-pocket expenses. Complex health system interventions, such as PBF, requires consideration of a review of the approaches aimed at assessing specific underlying assumption or theories of change. This will allow a better and broader understanding of the system's strengths and weaknesses, where the gaps lie, whether the theory of change is sound, as well as to inform policy design and implementation.

Method: The protocol was registered in PROSPERO with registration number CRD42020222893. The systematic review is reported in accordance with the guidelines for the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) checklist. We performed a critical appraisal of selected studies using the risk-of-bias criteria developed by the Cochrane Effective Practice and Organization of Care. Grading of Recommendation and Evaluation, Development and Assessment was used to assess the overall strength of the evidence.

Results: Of a total of 9,025 abstracts screened, 292 were relevant for full-text screening and 88 studies were assessed for eligibility. 16 studies were included in the review. Meta-analysis was inappropriate, and a narrative synthesis is reported. PBF may facilitate the removal of operational barriers to enhance utilization of certain maternal health services in some context, especially in public facilities.

Conclusions: As an add-on to an existing payment mechanism, PBF may facilitate or enable the utilization of skilled birth delivery in some context, the implementation of PBF can be considered a potential access instrument in reducing out-of-pocket expenses to stimulate demand for maternal services. However, the implementation approaches employed will determine utilization, taking into consideration existing equitable and inequitable access characteristics which also varies by context.

Key Questions

What is already Known?

- Performance-based financing (PBF) assumes that subsidizing user fees to reduce out-of-pocket expenses will expand coverage and reduce inequities in access to maternal health services.

Previous reviews have assessed the effect of performance-based financing interventions only on consultation fees (which is only one component of out-of-pocket expenses) and as a secondary outcome in low middle-income countries.

What are the new findings?

- To the best of our knowledge this is the first review that has examined this PBF theory of change. PBF may facilitate the removal of operational barriers to enhance utilization of certain maternal health services especially in public facilities and in settings that have already instituted some form of user fee exemption policies on maternal and child health services.
- The household characteristics and the asset index scale that is typically used to categorize wealth groups in sub-Saharan Africa may not necessarily match the PBF definition and classification of the poor. There is a need to clearly define the “poor” within each context and align with the PBF definition of who constitute the poor, to ensure appropriate classification and reporting.

What do the new findings imply?

- PBF is a behavioral change mechanism and therefore, poor implementation approaches and delay in payments can potentially demotivate health providers from making additional efforts to reduce OOP expenses. This, in turn, likely will not stimulate demand from the poor, impairing intended efforts to expand coverage and address inequities.
- Future studies in sub-Saharan Africa should consider the important differences that may exist in the health sector (public and private), especially in areas of cost and explore potential differences. This will ensure data are well disaggregated and reported to understand where PBF impact is more to inform relevant intervention strategies and policy.

3. Introduction

Following the Bamako Initiative in 1987, whose aim was to address severe concerns in financing care in the fields of primary healthcare and maternal health, most sub-Saharan African countries adopted user fees as a means of financing healthcare which resulted to increase in out-of-pocket (OOP) expenses to consumers [1-6]. This policy was part of a structural adjustment program promoted by the World Bank [1,2]. However, the introduction of user fees was later found to be a major barrier in accessing essential maternal and child health services, especially among poor individuals, with potential adverse consequences of impoverishing households e.g., catastrophic payments [1-6]. Recently, there has been an increase in the momentum and international discussions on the need to introduce reforms to subsidize or abolish OOP expenses as a strategy to increase access to, and utilization of, maternal health services, especially in sub-Saharan Africa [4].

Generally, OOP expenditures are defined as the direct payments made by individuals to healthcare providers at the time-of-service utilization, which are categorized into formal and informal fees [7]. These payments include fees for medications, contraceptives, laboratory tests, provider services, facility fees, and transportation expenses⁷ and exclude any prepaid payments, such as insurance fee [7-9]. Financial aspects have also been reported to be a major barrier to accessing antenatal care (ANC) and skilled birth delivery in most sub-Saharan African countries [1-6]. This financial barrier, among other factors, have contributed to high rates of maternal mortality, reaching up to 600/100,000 live births in most countries of this region [10-13]. Many studies performed in Ghana, Burkina Faso, Sierra Leone, Malawi, Senegal, Kenya, and Burundi, among other countries, have shown that abolishing user fees has a substantial positive effect on the number of institutional deliveries [1,4,10-16]. In Burkina Faso and Ghana, user fee reforms were found to result in up to a 25%-point increase in institutional deliveries [4]. Other studies have revealed inequities in outcome, benefiting rich individuals more than poor individuals [4].

In an attempt to address some of these maternal health problems, performance-based financing (PBF) is being implemented in many sub-Saharan African countries, largely with a focus on maternal health services [7]. PBF is a supply-side strategy that pays providers incentives based on predefined quality and quantity criteria [8,9,17-19]. PBF aimed at paying providers incentives to change their behavior (whereby providers are motivated with incentives through policy changes) and stimulate demand for services by a change in cost and increase the ability of individuals to access services based on affordability [17-19]. One of the pathways through which PBF can influence the use of maternal services is the effect on OOP expenses [17-19]. For example, reducing OOP expenses to enhance utilization and receive financial rewards [17-19] and, in some cases, reducing informal or unofficial fees, which are payments made in addition to official fees, also called “under-the-table” payments [8,9]. PBF assumes that “subsidizing user fees and incentivizing providers to improve financial protection by reducing OOP expenditures will increase the utilization of maternal services and reduce inequities” [8]. This assumption constitutes one of the areas in which PBF intersects with universal health coverage (UHC), defined as “expanding the coverage of health services for the general population, especially for the poorest” [8].

PBF is usually associated with process changes for example, increasing a facility’s resources due to PBF interventions can improve the availability of equipment, drugs, and medical supplies at the facility, thus having an indirect effect on OOP expenses in terms of cost for drugs purchase within the facility compared to private pharmacy off the health facility, and this may directly reduce OOP expenses related to ANC, contraceptives, and skilled birth delivery [17-19,20]. In some PBF designs, demand-side incentives to offset OOP expenses are incorporated as best practices to enhance effectiveness [8,17,18,25,26], and the exemption of user fees for the most vulnerable group intended to stimulate demand from this group [17,18]. However, it is also possible that PBF could increase the level of inequality in access if providers only select services or target services that are easier to reach [17,27]. Previous reviews have reported PBF interventions on OOP expenses as a secondary outcome with a focus only on consultation fees in low -and -middle income countries [20-24]. However, a consultation fee is only one of the items that constitutes OOP expenses. Previous reviews did not specify what aspects of

consultation fees which may include other services not related to maternal health services. This review is focused on investigating the effect of PBF on each OOP expenses for maternal services as defined above and includes both demand (implemented to enhance PBF) and supply side PBF strategies. The review builds on the above PBF assumption on subsidizing user fees to reduce OOP expenses and apply Andersen et al.'s contextual and enabling characteristics of the behavioral model on healthcare utilization to discuss the outcomes, using their six dimensions of access (see Table 3.1) [28]. As documented in the protocol [32], the rationale for applying this model is to understand the interplay of the contextual and individual characteristics and how PBF as a mechanism to stimulate behavior change interplay with this in improving access and utilization of maternal services to improve equity.

Table 3.1. Dimensions of access by Andersen et al

Dimensions of Access by Andersen et al.	Definition	Operationalization for purposes of data extraction in systematic review
Potential Access	Health financing policy in place	Implementation of performance-based financing policy
Realized Access	Actual utilization of services as a result of the health financing policy	Utilization of antenatal care, skilled birth delivery due to PBF as reported in the study
Effective Access	Improving health status from health service use and is a function of potential and realized access	Changes in utilization as reported in the study <u>as a result</u> of the timely use of services in the implementation of the health financing policy
Equitable Access	Ensures distribution of resources based on need	Consideration of equity variables--income groups, place of residence and contextual differences in resource allocation as reported in the study
Inequitable Access	Focused on the process of reducing the influence of social characteristics on the distribution of health services	Consideration of approaches used to address information barriers amongst population groups as reported in the study
Efficient Access	To minimize the cost of improving outcomes as a result of health service use	Cost minimization for specific services (ANC, skilled birth delivery and/or family planning) to improve utilization and outcome

Source: Adapted from Andersen et al., 2013

In most sub-Saharan African countries, healthcare services are largely delivered in both public and private sectors, and PBF interventions are mostly implemented across all health sectors. In addition, OOP

expenses for maternal health services in the public sector differ from those in the private sector. Higher OOP expenses in accessing maternal health services have been reported in the private compared with the public sectors [1-7]. Given the high OOP expenses that impede access to maternal services in sub-Saharan Africa [1-7], a major gap is the lack of evidence on how PBF mediates OOP expenses to improve access to ANC, skilled birth delivery, and family planning across the health sectors.

Complex health system interventions such as PBF, requires consideration of a review of the approaches aimed at assessing specific underlying assumption or theories of change. This will allow a better and broader understanding of the system's strengths and weaknesses, where the gaps lie, whether the theory of change is sound, as well as to inform policy design and implementation [19,29,30]. It also helps to identify missing links or gaps in the process to further inform programs and intervention designs [19,29,30]. Such understanding can inform country-level policies for PBF on ANC, skilled birth delivery, and family planning. This review is timely as it is in line with the growing call for UHC and the recognition of addressing equity in access to maternal health services and the global action for health promotion, which calls for sustainable financing [31]. This has also been compounded by the current COVID-19 pandemic, which has re-emphasized the need for a more equitable distribution of resources and improvement of the social determinants of health variables. Thus, our objective seeks to assess the effect of PBF interventions on OOP expenses as a mediating factor toward improving access to, and the utilization of ANC, skilled birth delivery, and family planning. This review was guided by the following questions: (1) What are the PBF supply- and/or demand-side interventions implemented or identified toward reducing OOP expenses for ANC, skilled birth delivery, and family planning in sub-Saharan Africa? (2) What is the effect of PBF interventions on OOP expenses in improving access to and the utilization of ANC, skilled birth delivery, and family planning and across health sectors in sub-Saharan Africa?

4. Methods

4.1 Protocol and Registration

The protocol was registered in PROSPERO with registration number CRD42020222893 and published with BMC Systematic Reviews [32]. The systematic review is reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) checklist [33,34]. We performed a critical appraisal of selected studies using the risk-of-bias criteria developed by the Cochrane EPOC Group for randomized and nonrandomized studies [35]. We used the Grading of Recommendation and Evaluation, Development and Assessment (GRADE) tool to assess the overall strength of the evidence with respect to effect estimates [36-38]. In addition, we used the AMSTAR tool to perform a quality assessment of the systematic review [39], performed by two independent reviewers (MN, OO). We also attached the PRISMA checklist to this systematic review.

4.2 Search Strategy

We developed our search terms in consultation with an information specialist. We then combined the search terms for PBF and sub-Saharan Africa. We developed the search criteria initially in Ovid Medline and then adapted the search strategy to the following databases: EMBASE, CINAHL, Cochrane Library, and CABI. We also searched the World Bank e-library for PBF impact evaluations, Department for International Development research output database, and ELDIS development database (eldis.org). We did not set a publication year limit, and the last search was conducted on January 29, 2021. We screened the reference lists of all the included papers for additional studies. Additionally, we searched clinical trial registries to identify completed and/or in-progress studies and hand-searched relevant study references. The full electronic search strategy for all databases is appended (Appendix H).

To be included in the review, each study had to meet the following criteria. (1) The intervention must be PBF strategy and may include a demand-side intervention implemented as part of a PBF program), (2) the intervention must include considerations of aspects of OOP expenses aimed at either directly or indirectly enhancing access and utilization, (3) the study results must quantitatively report impact on access to and the utilization of ANC, skilled birth delivery and family planning irrespective of the direction of the effect. We excluded papers that reported the outcomes but did not assess or report on any pathway of PBF intervention in reducing OOP expenses. We included randomized controlled trials

(RCTs) and quasi-experimental studies conducted in sub-Saharan Africa and published in English or French. We also assessed the effect of PBF across the different health sectors. For the outcome, this included (i) any reported PBF interventions on OOP expenses for ANC, skilled birth delivery, and family planning and (ii) any reported (or observed) changes in ANC, skilled birth delivery, and family planning attributed directly or indirectly to PBF effect on OOP changes and across the health sector. Finally, we excluded all commentaries, perspectives, expert opinions, conference proceedings, and editorials.

4.3 Study Selection

Screening and eligibility assessments were performed independently by two reviewers (MN and OO). We exported the search results to Endnote for duplication removal and referencing. We also exported the studies to Covidence [40] for additional duplicate removal and independent screening. The first round of screening, which involved titles and abstracts, was conducted independently by MN and OO. Inclusion and exclusion criteria were developed through calibration of a small number of studies to establish clarity on the inclusion and exclusion criteria. Any disagreements were resolved by consensus. When no consensus was reached, additional reviewers (SY and JL) were consulted. We retained all studies reporting an intervention using PBF and our outcomes. When full-text articles could not be retrieved, we contacted the authors. We excluded studies that only reported PBF interventions toward ANC, skilled birth delivery, and family planning without reporting any intervention effect or policy change on OOP expenses. Moreover, we excluded all studies that were not performed within sub-Saharan Africa.

4.4 Data Extraction

Data were extracted independently from the included studies by two reviewers (MN and OO) using a data extraction form adapted from EPOC [41]. Any disagreements were resolved by consensus, and when no consensus was reached, other reviewers (JL and SY) were consulted. We contacted the authors of the included studies (twice if necessary) when the extraction was difficult or unclear or when data was missing. We extracted data on the year of PBF implementation, health sectors, and health system financing mechanisms in place before PBF, with a specific focus on the health system policies that were

implemented on maternal health before PBF. We then extracted methodological and population level data on the study design and objectives, population of interest and study outcomes, and any equity considerations. Additionally, we extracted data on access measures adapting the six dimensions of access as described by Andersen et al [28]. For the intervention, we extracted data on any reported OOP expenses in relation to medication costs (specifically for those during ANC), contraception fees, skilled birth delivery, laboratory tests, and ANC fees.

4.5 Assessment of Risk of Bias in Individual Studies

We used the EPOC risk-of-bias tool to assess the quality of the methodology used for RCTs and Controlled before-and-after studies (CBA), and ITS analyses [34]. This tool defines three criteria rated as “high,” “low,” and “unclear”³⁵. The risk of bias was assessed by two independent reviewers (MN and OO). Any disagreements regarding the risk of bias were resolved through consensus.

4.6 Summary Measures of Effects

For the summary of findings, we used the GRADE tool [36], only studies that met the following criteria were included in the appraisal: RCTs, controlled before-and-after studies, and interrupted time series with a predefined shape that clearly states the pre-intervention period, and the point of analysis clearly defined as the point of intervention [35]. Studies that did not meet these criteria were only described in the narratives. We extracted post intervention effect estimates for RCTs, controlled before-and-after studies, and recorded changes in the level and slope for interrupted time series. The most used analysis across all study designs was difference-in-difference analysis, adjusting for covariates and potential confounders. Most of the studies generated relative effects reported as regression betas. Some of them did not report confidence intervals or in some cases, a standard deviation, we recalculated the regression betas for 8 studies (2 RCTs and 6 CBA) using the approach described in the Cochrane review [22]. Thus, we divided the effect estimate of the beta by the baseline control group mean and multiplied by 100 to obtain the relative percentage change for the outcome attributable to the intervention [22]. We did not reanalyze the data for the 2 ITS and did not extract data for results presented graphically. We then appraised the

analysis for each study included in the summary of findings table to ensure that the studies are adjusted for clustering and controlled for potential confounders.

Poor reporting of data prevented adequate assessment of statistical heterogeneity and made it impossible to perform a robust meta-analysis. We also noted this as a gap in reporting. Therefore, we reported the results as a narrative synthesis using the synthesis without meta-analysis guidelines (SWiM) [42] and excluded less robust studies in the summary of findings table.

To be eligible for the GRADE synthesis, each study must have measured OOP expenses in one of the following ways and reported the effect estimates: the probability of paying for OOP expenses during skilled birth delivery (or the percentage of women who paid for delivery), the probability of paying for any ANC visits, or the probability of paying for family planning. Alternatively, each study must have reported any change in user fees or presented results that compare any additional demand-side subsidies to offset OOP expenses versus a control group or reported results or effects of any policy change because of PBF on OOP expenses for ANC, skilled birth delivery and family planning.

We carried out a subgroup assessment for each outcome if the authors reported and disaggregated results that compared the additional incentives or strategies to offset OOP expenses on the outcome and by wealth quintile. This was achieved by extracting data for each outcome as reported in the study according to specific intervention groups based on the additional incentives and/or wealth categories. We did a sensitivity analysis based on the study design by reporting the results for each outcome assessed using an RCT [22]. Thereafter, we assessed the certainty of the evidence using the EPOC group worksheet criteria (high, moderate, low, or very low, as well as the GRADE consideration for the risk of bias, inconsistency of the results, imprecision, indirectness, and publication bias) [35-38]. In the absence of meta-analyses, we used the EPOC table recommended for presenting findings without a meta-analysis, assessed the level of certainty to present the overall direction of effect of the intervention, and provided justifications for the assessed outcome [35-38]. GRADE assessments were conducted by two independent reviewers (MN and OO), and disagreements were resolved through discussions and consultation with SY and JL.

4.7 Patient and Public Involvement

Patients and providers were not involved in the systematic review.

5. Results

This review is a narrative synthesis with a summary of findings on treatment effects without a meta-analysis. Of a total of 9,025 abstracts screened, 292 were found to be relevant for full-text screening. Of the 292, a total of 204 were excluded and 88 were assessed for eligibility. In total, 16 studies were included in the review presented in the PRISMA flow diagram (Fig 3.1 below). A list of the excluded studies is in Appendix J.

Figure 3.1. PRISMA flow diagram

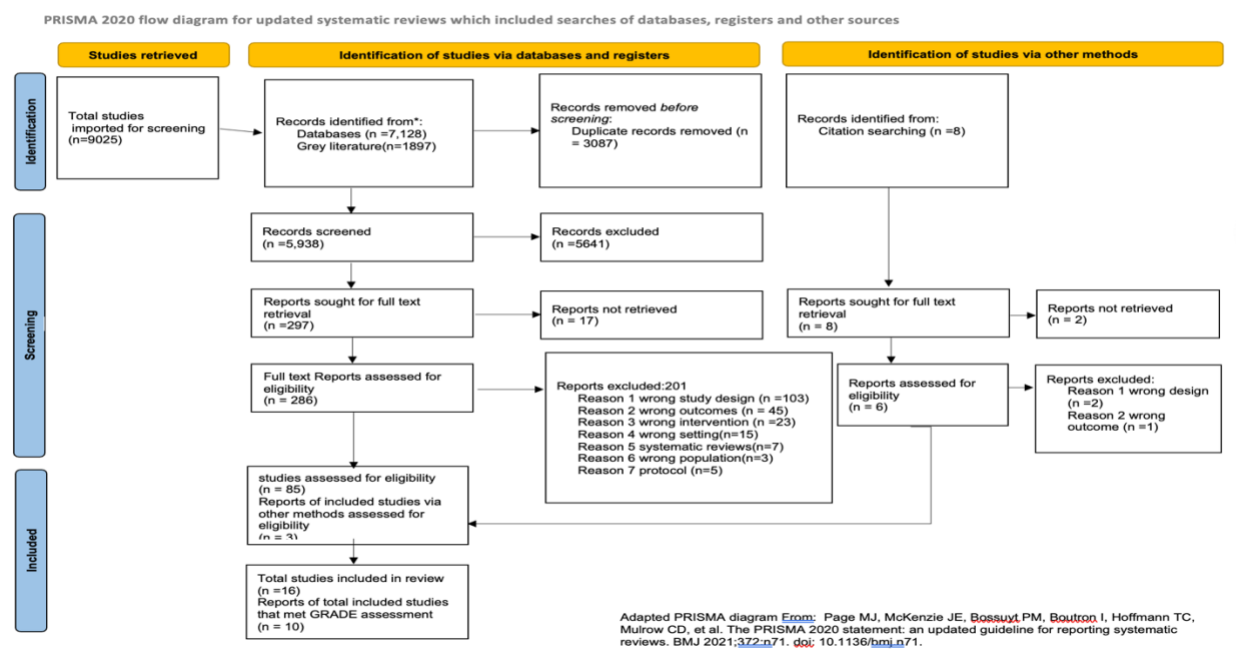


Table 3.2. Health system characteristics of PBF-included studies including health financing mechanism before PBF, pathways of OOP expenses and overall findings

Author, Year, Country	PBF intervention/year of implementation	Health care delivery sectors	Health financing mechanisms for RMNCH before PBF	PBF intervention on OOP items (directly or indirectly), demand or supply side strategies	Main study findings
1.Tanzania					
Anselmi et al, 2017 Tanzania	Financial incentives to health facilities, districts & regional. conditional on performance, quality and quantity of services. PBF implemented in 2011	Public and private sector	Women are supposed to be exempted from payment during delivery in public facilities--not enforced effectively before PBF	Direct-PBF induced effect on providers enforced efforts on exemptions of OOP expenses to attract women to facilities for skilled delivery—Indirect-Reduced probability of paying out-of-pocket for institutional delivery	PBF increased supervision visit which had an effect on the uptake of two doses of antimalarial during ANC visits. Reduction in proportion of women who paid for skilled birth delivery in general with more impact on public facilities. Increased utilization of SBD by 48% & in public facilities by 78%. Increased skilled delivery in rural vs urban women
Binyaruka et al., 2018. Tanzania	Performance incentives targeted at facilities for staff, demand creation initiatives and performance improvement, districts, and regional managers.	Mentioned of public facilities and private pharmacies	User fee exemption policy—not enforced	Indirect-Reduced chance of paying user fee and increased availability of drugs and supplies which reduced cost of purchasing drugs from private pharmacy Direct--Reduction and increase adherence on user fee exemption for delivery especially in public facilities	Increased adherence on user fee, significant increase in the rate of institutional deliveries among women in poorest and in middle wealth status households, but not among women in least poor households. PBF effect on institutional deliveries was significantly higher among women in rural districts compared to women in urban districts.

Binyaruka et al., 2015 Tanzania	Financial payments to health facilities, district and regional health managers as a bonus based on achievement of targets relating to maternal and child health care	Public and private	User costs for institutional delivery should be free at government facilities, although user fee exemptions are not well enforced	Direct--PBF resulted in greater enforcement of adherence to the exemption policy (free care) in public facilities which was measured as the share of patients paying out-of-pocket or giving gifts to service providers.	Increased institutional deliveries and the provisions of anti-malarial during antenatal visits. Positive effect on overall coverage for ANC but no effect on proportion of women having 4 or more ANC. P4P was associated with reduction in those paying out-of-pocket for deliveries but there was no evidence of an effect on the average amount paid
Canavan 2010 Tanzania	Fixed amount paid to health mission health facilities for five targeted services, to strengthen Diocesan Health Services in improving access, quality of services and organizational performance Implemented in 2006(CORDAID)	Public and private sectors	The exemption of user fee is in theory as advocated by MOH--free treatment for all pregnant women, some faith based apply the policy exemption for the poor, no equity funds, or Community health funds at faith based. user fees generally expensive in faith based compared to public facilities	Insufficient information	PBF facilities not performing well for both institutional deliveries and ANC from 2005-2007
2. Nigeria					
Ashir et al., 2013 Nigeria	Focused on demand side PBF scheme, providing cash incentives to women based on performance indicators for ANC & Skilled birth delivery, community approach not specifically targeting poor women. PBF was implemented	Public & private but no private health facilities in the study state	Public health facilities receive free drugs, medical supplies	Direct demand PBF--Cash incentives to women for ANC1, ANC4, \$ skilled birth delivery-including transportation to offset OOP expenses but not specifically for poor-universal approach	Demand-side PBF led to an increased in utilization of up to 4 ANC visits and the use of skilled birth delivery in intervention compared to control

in 2011

3.Burundi

Bonfrer et al.,2014a Burundi	Facilities receive payments based on the quantity and quality of health services provided PBF implemented in 2006	Public & private	7months before PBF, user fees for deliveries, caesarean sections, and care for children under age five were removed at public health care facilities, throughout the country	Direct--To replace lost income from eliminated user fees, facilities received payments from the government for the services provided for free. Ministry of health incorporated the payments for MNCH services into PBF scheme	Increased proportion of institutional deliveries, use of modern family planning and increased overall quality score for health facility, no change in quality of care reported by patient & no differential effect across socio-economic groups
Bonfrer et al.,2014b Burundi	Health care facilities received payments based on the quantity and quality of services provided. PBF implemented in 2006	Public and private	7months before PBF, user fees for deliveries, caesarean sections, and care for children under age five were removed at public health care facilities, throughout the country.	Direct--Government converted income loss from user fees into performance-based financing scheme and incorporated into the PBF program	Increased in institutional deliveries especially amongst the better off but no effect on the poor. No effect on place of residence or facility type

4.Malawi

Brenner et al., 2020 Malawi	Service delivery integrated performance-based incentive (SSDI-PBI) PBF implemented in 2014	Public/private but PBF was implemented only in public facilities	Essential health package meant to be free at point of care for public and private non-profit facilities contracted by MOH, but evidence indicates not effectively available subjecting clients to some substantial OOP expenses	Insufficient information	First trimester ANC showed positive trends in facilities and hospitals. Skilled birth delivery- no change in either facility type, or family planning counselling. In both health centers and hospitals, positive PBI effects on antenatal care included resilience against interrupted supply chains and improvements in attendance rates.
Chinkhumba et al.,2017 Malawi	P4P incentives includes both supply-side and demand-side	Public/private	provision of free emergency obstetric care at all public	Demand side incentives paid to pregnant women irrespective of socio-	Time to seek care decreased by 34.2% at endline in PBF areas relative to non-PBF areas. No

	conditional financial incentives. RBF for MCH implemented 2013- focused only on obstetric emergency care delivery		health facilities and selected private not-for-profit facilities contracted by the government, evidence indicates medical costs are still shifted towards patients due to stock outs of drugs and other items needed for surgery.	economic status-cash transfer average US \$10.50 per woman consist of a flat sum and a variable portion in relation to distance travelled and hospital stay 48hours postpartum	substantial change in household costs observed. PBF induced quality improvements, prompting faster decisions for obstetric care seeking at household level. Observed substantial reduction in indirect cost for households benefitting from CCT
Brennar et al., 2018 Malawi	To enhanced obstetric care provision through a combination of PBF payments to facilities and district health managers and demand side mechanism conditional cash transfers to pregnant women in the catchment areas	Public/private sector	Obstetric care is free through public and contracted not-for-profit health facilities, however, 75% of pregnant women do not receive satisfactory emergency obstetric care	Demand side PBF-- Provision of conditional cash transfers within the PBF program provided upfront to women to offset transportation, basic childbirth items, and stay in maternal waiting home and average opportunity cost for poor patient or family during a 48-h postpartum facility stay	Improved coverage for pregnant women with facility-based obstetric care after a two-year implementation.
Brennar et al., 2018 Malawi	To enhanced obstetric care provision through a combination of PBF payments to facilities and district health managers and demand side mechanism conditional cash transfers to pregnant women in the catchment areas	Public/private sector	Obstetric care is free through public and contracted not-for-profit health facilities, however, 75% of pregnant women do not receive satisfactory emergency obstetric care	Demand side PBF-- Provision of conditional cash transfers within the PBF program provided upfront to women to offset transportation, basic childbirth items, and stay in maternal waiting home and average opportunity cost for poor patient or family during a 48-h postpartum facility stay	Improved coverage for pregnant women with facility-based obstetric care after a two-year implementation.
5.Cameroon					

De Walque et al., 2017 Cameroon	Financial Incentives rewarded to facilities based on verified quantity and quality indicators of service provision. PBF implemented in 2012	Public & private	Out-of-pocket expenses. Gov't subsidized delivery kit (led to a reduction in the cost of delivery kit in public facilities) within the period that PBF was introduced	Direct--laboratory and x-rays fees declined by (\$2.38), Indirect--change in official provider fees for antenatal care was lower in the PBF group (\$1.68) compared to control, unofficial provider fees reduced by (\$3.64) compared to control	PBF did not impact on ANC and skilled birth delivery, however, it had positive effect on family planning based on facility data. Out-of-pocket health expenditures decreased for households in the PBF arm, including unofficial payments and this decrease in revenue did not come at the cost of process quality
Egbe et al., 2016 Cameroon	PBF trained nurses to provide women education in their homes about contraception and prevention of sexually transmitted infections	Only mentioned of public sector	Did not clearly mentioned and provided insufficient information	Condoms free and available in public pro pharmacies. Other contraceptive methods subsidized and available in other public facilities. Average cost of contraceptives 2.63USD	PBF home visits let to a significant increase in utilization of modern contraceptive methods in the area with PBF home visits relative to the control areas
6. Gambia					
Fergusoh et al., 2020 Gambia	PBF incentivized the provision of specified maternal and child nutrition and health services, including facility-based delivery by a skilled practitioner, as well as incentivizing service quality and a conditional cash transfer (CCT) program for attending ANC's and a community-based intervention package	Not mentioned	Not mentioned of pre-existing financing mechanisms for maternal services	Demand side PBF--Women enrolled in a conditional cash transfer program for attending first ANC within 12 weeks and three additional ANC's and a community-based intervention package including transportation to offset OOP expenses	No significant change in skilled delivery within the 18months, however, the PBF scheme increased proportion of women referred to health facilities for skilled birth delivery, increased proportion of women accompanied and transported to the facility
7. DRC					
Huillery &	Payment was only	Did not	not mentioned of pre-	Reduction of user fees for	No impact on use of modern family

Seban, 2014DRC	conditional on the number of patients for some pre-determined services. less stringent on quality due to context related aspects PBF implemented in 2010	mentioned	existing financing mechanism for maternal services	some targeted services by health workers, medication	planning. Reduced OOP cost on targeted services especially facilities with high cost but PBF efforts made by health workers did not lead to change in utilization of services in the population
8.BurkinaFaso					
Kuunibe et al.,2020 Burkina Faso	Incentives rewarded to facilities based on verified quantity and quality indicators of service provision. PBF implemented in 2011	Health care delivery mostly organized via public sector	User fee exemption for skilled birth delivery before PBF	2 years after PBF scaled up, in 2016 government introduced nationwide free health for maternal health services	Before free health services, PBF Increased in trends of ANC 0.4% and 0.1% for family planning no effect on SBD.With free health services, PBF did not have any effect on services and a decreased of 0.3% family planning Moderate increase in use of ANC and family planning but no change in skilled birth delivery. However, with introduction of the nationwide free services, there was no further increase in this service provisions.
Mwase et al 2020 Burkina Faso	4 different models, 3 of which included an equity intervention targeting specifically the ultra-poor Health facilities were rewarded based on defined health service indicators using a case-based payment system, adjusted for quality of care after verification.	Did not mentioned	Removal of user fee for ANC in 2002 and 80% removal fees for skilled birth delivery in 2007	Services provided to ultra-poor reimbursed at a higher unit price to compensate for lost revenue from user fees and to incentivized providers to reach out to poor. In 2016 government introduced nationwide free health for maternal health services. MOH adjusted PBF prices by removing additional equity payments	PBF produced modest changes compared to status quo, the implementation of equity interventions did not generate additional benefits compared to PBF alone, neither for women in general nor for the poorest women specifically

PBF Implemented in 2011 and equity measures combined in 2014	due to complete removal of user fees
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*Findings column is only for the outcomes of interest to the review and not necessarily all the outcomes studied by each paper

*RMNCH: Reproductive maternal newborn child health

Table 3.3. General methodological characteristics of PBF-included studies

Randomized controlled trials and cluster RCT						
Author/Year/ Country	Study aim	Characteristics of Study population	Facility Type/health settings/timeline Measurement timepoints and follow-up	Relevant outcomes	Data Source/data analysis type	Equity consideration
De Walque et al., 2017 Cameroon	Impact of PBF on maternal and child health service coverage and quality	Women, children, and health providers survey 6275 women	26 districts; 14 included in the analysis, 259 facilities, 164public, 48confessional, 33Private for profit and para-public	Antenatal care, skilled birth delivery, family planning	Household, facility, and exit surveys Difference-in-difference	Equity consideration in the PBF design (geographic accessibility, poverty and population density)
Fergusoh et al., 2020 Gambia	Assessed factors contributing to the impact of incentivising activities related to skilled birth delivery uptake and the causes of delays in accessing skilled birth delivery.	2400 households Head of households and women with children under five years	Facility types not mentioned 3 regions, serving 800 communities; 22 health centers, 2 hospitals, 19 health facilities (3-intervention arm versus control)	6 indicators geared at skilled birth delivery	Household surveys	Equity consideration in data analysis on ethnicity
Mwase et al 2020	Examined PBF effects on maternal health service utilization and defined equity as equal access given equal need, with access measured as reported service use and need	Women aged 15-49	Total 24 districts, 416 facilities in intervention districts and 117 in the control districts. Component 1; INT 4932 CTL, 1439. Component 2; INT PBF1 1099; PBF2 983; PBF3 1010. Comparison PBF1 368, PBF4 605. Study period 2013-2017. C-RCT nested within CBA	Institutional deliveries, ANC visit in first trimester and at least 4 ANC visits, family planning	Survey-self reported Difference-in-difference analysis	Consideration of equity in both PBF design and analysis

Huillury & Seban, 2014 DRC	Assessed the effect of PBF on user fees, health worker and work-related stress, utilization of services and health status	332 health workers, 1014 patients, household surveys 1708	1 district, 96 health areas, Admin data 152 facilities assigned into two payment groups. Survey 123 facilities in 87 health areas; 44 from PBF payment group and 43 from Fixed payment group StudyPeriod:2009-2013	Access-user fee, birth delivery, prenatal visits, postnatal visits	Household and facility surveys Difference-in-difference analysis	Equity consideration on place-urban and rural in analysis
Controlled before-and-after studies						
Author/Year / Country	Study aim	Characteristics of Study population	Facility Type/health settings/timeline Measurement timepoints and follow-up	Relevant outcomes	Data Source/data analysis type	Equity consideration
Anselmi et al, 2017; Tanzania	Test the causal pathways through which PBF may influence the utilisation of maternal health services	3000 women who have delivered: 200 health workers	Public & private, 11 districts; 150health facilities (75 in each arm) 7 intervention 4 comparison districts 13 months	Utilization of skilled birth delivery, uptake of antimalarial drugs	Surveys/ Difference-in-difference analysis	Not defined or mentioned
Ashir et al., 2013 Nigeria	Role of demand-side PBF scheme in improving utilization of maternal services	Women and children under 5. ANC 4 visits, INT 192 women & 59 control Skilled delivery INT 63women; control 20	Public: 8 community areas (6 intervention, 2 control) 6 months	Utilization of ANC, skilled birth delivery& immunization	Administrative data/ Descriptive statistics	Study targeted disadvantaged groups in terms of age, poverty, education, parity
Binyaruka et al., 2018; Tanzania	Examined the heterogeneity of P4P effects on service	3000 Women who have	11 districts (7 intervention, 4 control),75 facilities intervention and similar	Institutional deliveries and uptake of	Surveys/ difference-in-difference model	Equity considerations in the study

	utilisation across population subgroups	delivered 12 months prior to survey	number for control 13months	two doses of (IPT2) for malaria during antenatal care		assessment across population groups and income group
Bonfrer et al.,2014a Burundi	Effect of PBF on the utilization and quality of health care services	Household Survey conducted in 2006(N=500), 2008(N=300 PBF, 1,050Non PBF), 2010(N=1,3 50 PBF	9 provinces, 700 facilities Study period 2006-2010	ANC, institutional deliveries, pregnant women fully immunized, use of modern family planning	Household surveys/ Difference-in-difference model	Equity consideration in the study selection criteria & assessment (income & presence of private for-profit health facilities
Bonfrer et al.,2014b Burundi	Extended previous work covering all provinces and using DHS data effects on the quantity of child and maternal care use and its quality during antenatal care (ANC) visits	4916 women (survey focus on birth from 2005-2010)	Public and private 17 provinces; 700 facilities August 2010-January 2011	Antenatal care visits, institutional deliveries (in public or private)	DHS data /difference-in-difference analysis	Equity consideration in the study assessment for income groups, private and public facilities
Binyaruka et al., 2015 Tanzania	Effect of a P4P scheme implemented at scale in one region on quality and utilisation of targeted and non-targeted services, user costs and equity	3000 women who have delivered 12 months prior to the survey	Public and private 11 districts (7 intervention, 4 control),75 facilities intervention and similar number for control Survey conducted 2012 & 2013(13months)	Antenatal care, user cost, long term contraceptive s, skilled delivery	Household, exit & facility Surveys/ difference-in-difference analysis	Equity consideration in study assessment across income groups
Brenner et al., 2018	Examine the impact of RBF scheme on	Survey user sample 5509	Facility sample 32 facilities; 25 interventions and 9 control.	Facility-based	Household questionnaires and	Equity considerations in

Malawi	effective coverage for facility-based obstetric care services	women; obstetric sample 383 women.	April 2013 to July 2015	obstetric care	observation checklist. Difference-in-difference analysis	analysis on household socioeconomic status
Chinkhumba et al.,2017	The impact of RBF on household costs and time to seek care for women with pregnancy related complications	2219 women	Public & private facilities,17 public and after 1year additional 11 facilities, 6 privates non for profit including 1 mission and 5 public May 2013 to July 2015	Skilled birth delivery	Household surveys Generalized linear model	Equity consideration in assessment of outcome
Canavan 2010 Tanzania	Compared mission faith-based health facilities with P4P versus Public facilities without P4P	Health center deliveries and ANC visits from 2006-2008	Public and private facilities Targeted only private--5 dioceses	Institutional deliveries of 10 per 1000 (hospitals) and 20 per 1000 (HCs and dispensaries)	Surveys and data from health information system	Insufficient information
Interrupted Time series Analysis						
Kuunibe et al.,2020 Burkina Faso	To assess impact of PBF and user fee exemption on MCH services	Facility data on utilization for antenatal care and skilled delivery and family planning	838 facilities (524 intervention, 314 controls) January 2013-September 2017(57months)	ANC and skilled birth delivery and family planning	HMIS data	Equity consideration in PBF design
Brennar et al., 2020	To explore whether patterns of change reflected by PBF effects on selected service indicators differed between health	31 data points-no further information	17 intervention and 17 control facilities (all public)5 hospitals and 12 health centers across 8 districts Data collected for 31months	Antenatal visits, skilled birth delivery, number attending family	Baseline data used DHIS and endline data collected primary data Interrupted time series analysis	Insufficient information

	centers and hospitals.			planning counseled on contraceptive options		
Cross Sectional Studies						
Egbe et al., 2016 Cameroon	To estimate the effect of PBF home visits on the use of modern methods of contraception by women of childbearing age in the Kumbo East Health District	Women of childbearing aged 15-49 in the study district	552 surveys; 226 in each group. 262 responded from intervention group and 221 from control group Data were collected from February 1 to May 31, 2015	Modern family planning contraceptive	27-item survey	Equity considerations in PBF design using home visits and analysis across socio demographic factors

Abbreviations: ANC: antenatal care; HMIS: Health management information system; DHIS: District health information system; DHS: Demographic and health survey

*Outcomes column is only for the outcomes of interest to this review and not necessarily for all the outcomes studied by each paper

Most studies included a control group, some used matched controls, some were evaluated at the subnational and national level, and most were evaluated at the district and facility level. Nine of the studies were CBA studies [17,19,25,43-48], two ITS [49,50], three RCTs [26,51,52], one a cluster-RCT [53] and a cross sectional study [54]. The studies were conducted in Burkina Faso, Burundi, Cameroon, Democratic Republic of the Congo, Gambia, Malawi, Nigeria, and Tanzania. PBF was implemented between 2006 and 2011, and most were either pilot studies or used data from the pilot studies. Most countries deliver care in both the public and private sectors (see Table 3.2), and OOP expenses varied by sector, which is noted to be more expensive in private than public sector, but the results were generally not reported in a disaggregated form. Four studies (from Malawi, Gambia, and Nigeria) combined demand-side strategies (conditional cash transfers) with PBF to offset OOP expenses [25,26,46,47]. Some incentivized traditional birth attendants for referrals and outreach programs and the use of home visits to improve access [25,26,54]. The study durations ranged from 6 to 57 months (see Table 3.3). Some studies adjusted for clustering at the level of the facility (even when the allocation was not done at the facility level). Risk of bias was assessed (Fig. 3.2 and Supplemental Tables 3.5-3.8) and most CBA had low quality mostly due to lack of randomization and allocation concealment. Some of the RCTs had high risk of bias mostly in allocation concealment and it was not clear how incomplete outcome data were addressed.

Figure 3.2a. Risk of bias: Interrupted time series

	Intervention independent	Shape of intervention	Data collection	Allocation	Incomplete data	Selective reporting	Other risks
Brennar 2020	Unclear	Low	Low	Low	Unclear	Low	Low

Kunnibe 2020	Unclear	Low	Low	Low	Low	Low	Low
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Figure 3.2b. Risk of bias: Randomized controlled trials

	Allocation sequence	Allocation concealment	Baseline measurement	Baseline characteristics	Incomplete data	Intervention	Contamination	Selective reporting	Other risks
De Walque 2017	Low	Low	Low	Low	Unclear	Low	Low	Unclear	Low
Fergusoh 2020	Unclear	Unclear	Low	Low	Low	Low	Low	Unclear	Low
Huillery 2014	Unclear	High	Unclear	Unclear	Unclear	Low	Low	Unclear	Low
Mwase 2020	Low	Low	High	Low	Unclear	Low	Low	Low	High

Figure 3.2c. Risk of bias: Controlled before-and-after studies

	Allocation sequence	Allocation concealment	Baseline measurement	Baseline characteristics	Incomplete data	Intervention	Contamination	Selective reporting	Other risks
Anselmi 2017	High	High	Low	Low	Unclear	Low	Low	Low	Low
Ashir 2013	High	High	High	High	Unclear	Low	Low	Unclear	High
Binyaruka 2018	High	High	Low	Low	High	Low	Low	Low	Low
Bonfrer 2014a	High	High	Low	High	Unclear	Low	Low	Low	Low
Bonfrer 2014b	High	High	High	Low	Unclear	Low	Low	Unclear	Low
Binyaruka 2015	High	High	Low	Low	High	Low	Low	Low	Low
Canavan 2010	High	High	High	High	Unclear	Low	Unclear	Unclear	High
Chinkhumba 2017	High	High	Low	Low	Low	Low	Low	Low	Low
Brennar 2018	High	High	Low	High	Low	Low	Low	Low	Low

*Egbe 2016

High	High	High	Low	Low	High	High	Low	Low
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*Cross Sectional Study

Note: Risk of bias assessment for the 16 included studies. A) Interrupted Time Series, B) Randomized Controlled Trials, C) Controlled Before and After Studies

5.1 PBF Intervention Strategies Including Setting and Health Policies

Most of the PBF interventions were compared against standard care, in some cases, PBF schemes were compared with nationwide free services. Of the eight countries included in the review (Table 3.2), Tanzania reported an unenforced exemption policy in public facilities before PBF [17,19,48]. Following PBF, providers re-enforced the user fee exemption policy to reduce OOP expenses [19,45]. The two CBA studies reported a significant reduction in OOP expenses and increased utilization of institutional deliveries [19,45]. One of the studies further examined this mediating effect of OOP expenses on skilled birth delivery in Tanzania and across sectors and reported an increase of 48% in institutional deliveries and 78% in public facilities [19]. Burundi reported a user fee exemption policy for deliveries and C-sections before PBF, as well as some potential constraints on transportation costs for poor individuals [43,44]. The government replaced the loss income from abolishing user fees (6 months before PBF) by incorporating payments of maternal and child services to the PBF program [43,44]. Before PBF, Burkina Faso had a user fee exemption policy for ANC, as well as 80% exemption of user fees for delivery care and full exemption for very poor individuals [49,53]. Following PBF, Burkina Faso introduced a nationwide user fee policy for pregnant and lactating women [49,53].

Demand side intervention such as conditional cash transfer was reported in Nigeria, Malawi, and Gambia [25,26,46,47]. Women were provided cash incentives for either ANC and/or skilled birth delivery and in some cases transportation cost to offset some elements of OOP expenses to enhance utilization of ANC and skilled birth delivery. In Malawi, before PBF, all primary healthcare services that are included in the essential health package were intended to be free at the point of care in both the public and private sectors [50]. However, evidence indicates that such services are not effectively available, subjecting women to substantial OOP expenses [50]. PBF did not result in any substantial effect on household costs, but an observed substantial reduction in indirect costs for households benefitting from conditional cash transfers was reported which suggest PBF can potentially reduce overall burdens on households [46].

Notably, Cameroon, the Democratic Republic of the Congo, Nigeria, and Gambia did not report any user fee exemption policies before or after PBF [25,26,51,52]. However, in Cameroon, the government introduced subsidies for delivery kits simultaneously during the introduction of PBF [51], and OOP expenses for some family planning contraceptives and informal cost were reduced because of PBF [51,54]. In the Democratic Republic of the Congo, providers considerably reduced OOP expenses for specific services [52].

In the pilot PBF study in Cameroon, PBF led to a significant reduction in household informal OOP expenses with a difference of \$3.64(USD), and a significant reduction in laboratory and x-ray fees by \$2.38(USD), and official provider fees for antenatal care by \$1.68(USD)[51]. A cross sectional study in Cameroon reported the use of PBF home visits to improve utilization of modern family planning contraceptives by 59% versus 46% in the control [54]. This was reported in an area where most of the population are farmers with limited time to listen to health promotion messages from the radio [54]. However, authors did not report if there were any implications on cost, rather, they reported that condoms were free at public health facilities, in addition to a subsidized cost for other modern family planning contraceptives in the public facilities, at an average cost of \$2.63 USD but they did not mention if it was due to PBF or not [54].

One RCT study from DRC assessed the percentage of paying for consultations and sending gifts to providers, but this was not disaggregated and may have included other forms of consultation not related to ANC, family planning, and/or skilled birth delivery [52]. However, the study reported a significant cost reduction for drugs [52] and noted that most facilities with reduced user fees because of PBF were those with initially high user fees [52]. Generally, user fees have been reported to be higher in private than in public facilities [19,48,51,52]. In Tanzania, the improved availability of drugs in turn minimized the need to pay for drugs in private pharmacies, which are usually expensive [19,45]. One RCT study from Cameroon reported on the availability of family planning contraceptives but did not report any effect associated with this on cost [51].

5.2 Impact on Outcomes: Direction of Relative Effect as Rated in GRADE

We used the GRADE tool to assess the overall strength of the evidence with respect to effect estimates and reported results [36,37]. We present and briefly summarize the outcome details in the summary of findings table (Table 3.4) using EPOC's recommended plain language summary approach [36] and the relative effect. Generally, the evidence is of low certainty. We noted that, PBF interventions with a standard comparator or standard care yielded positive results compared to when PBF was compared against other enhancing interventions. A total of 10 studies were included in the GRADE assessment.

**Table 3.4. Effect of PBF on OOP expenses to improve access and use of ANC, skilled birth delivery and family planning-
GRADE summary of findings**

Patients or population: Health care providers, pregnant women, health facilities, districts Settings: Sub-Saharan Africa-Cameroon, Tanzania, Burundi, Malawi, Burkina Faso Intervention: Performance-based financing program Comparison: any comparator or standard practice				
Outcomes	Relative change	Number of studies	Certainty of the evidence	Comments
Probability of paying OOP expenses during skilled birth delivery	Effect ranges from -31 to -42%	2(Anselmi et al. 2017 & Binyaruka et al. 2015)	⊕⊕⊕⊖ Moderate	PBF enforced exemption of OOP expenses for skilled birth delivery which had a positive effect on institutional delivery in 2 studies all from Tanzania. Sensitivity: No RCT measured or reported on this Subgroup by wealth: 1 of the CBA study for which relative change could not be calculated for subgroup reported greater reduction in the probability of paying for deliveries amongst the poorest group relative to the least poor.
Use of Skilled birth delivery in public versus private facilities	8.30%	3(Anselmi et al. 2017; Binyaruka 2015; Bonfrer 2014b)	⊕⊕⊖⊖ Low	Two CBA studies from Tanzania reported increased in skilled birth delivery more in public facilities due to adherence to user fee exemption policy and improved availability of drugs which in turn minimizes the need to pay for drugs in private pharmacies. 1 CBA study from Burundi reported no change in public vs private facilities but did not provide details in the results. Sensitivity: No RCT measured or reported on this
Use of skilled birth delivery (based on effect of OOP as a mediating factor)	9.4%	2(Anselmi et al. 2017 & Binyaruka et al. 2015)	⊕⊕⊕⊖ Moderate	Two CBA studies from Tanzania reported increased in skilled birth delivery due to the effect of PBF in enforcement of OOP expenses
Use of Skilled birth delivery (facility or institutional deliveries)	Effect ranges from 0.05% to 9.4%	10(Anselmi et al., 2017; Binyaruka et al., 2015 & 2018; Mwase et al., 2020; Bonfrer et al., 2014a & 2014b; Kuunibe et al., 2020; Brennar et al., 2020; De Walque et al., 2017;	⊕⊕⊖⊖ Low	PBF probably have a positive effect on facility deliveries (based on 5 studies). The other studies that relative change could not be calculated reported a positive improvement in utilization rate (downgraded due to risk of bias issues with some studies) Sensitivity: 2 RCTs reported 0.05 to 5.6% Excluding the 2 CBA studies from Tanzania, 0.05 to 5.6%

		Chinkhumba et al.,2017)		Subgroup analysis (4 studies): studies with additional demand side incentives to offset OOP expenses relative change indicates -0.01% for 1 RCT study, and 2 CBA studies for which relative change could not be calculated reported increased use of institutional deliveries amongst women in the middle wealth quintile and uninsured households. Subgroup by wealth groups (5 studies): for additional demand vs standard PBF by wealth quintile; lower 20% quintile, -0.10%; upper 80% -0.14% for 1 RCT study, and three CBA studies for which relative change could not be calculated reported increased use of institutional deliveries amongst women in the middle wealth quintile and uninsured households (Downgraded due to risk of bias issues)
C-section (EmOC)	N/A	1 (Chinkhumba et al., 2017	⊕⊕⊕⊕ Low	Only one study reported on this, and relative change could not be calculated
Use of Any ANC visits	Relative change ranges from 1.14 to 3.3%	4 (Kuunibe et al., 2020; Bonfrer et al.2014a &2014b ; De Walque et al. 2017)	⊕⊕⊕⊕ Low	PBF may have little or no effect on the use of any ANC visit.1 CBA study reported positive effect on overall ANC visits Sensitivity: 1RCT indicates 1.14% No subgroup effect measured or reported for this category
Use of ANC in 1 st trimester	0.08%	3 (Mwase et al. 2020; Bonfrer et al. 2014b; Brennar et al.,2020)	⊕⊕⊕⊕ Low	PBF may have desirable effect.1RCT 0.08. I CBA for which relative change could not be calculated reported no change (suggested likely due to the high utilization rate of more than 1 ANC of up to 96%) Sensitivity analysis RCT indicates 0.08% Subgroup analysis (3 studies): with additional incentives to offset OOP and stimulate demand relative change indicates - 0.1 for 1 RCT, other two studies relative change could not be calculated, I ITS reported greater improvement trend compared to control especially in health facilities when compared to hospitals, and I CBA for which relative change could not be calculated reported no change Subgroup by wealth groups (2 studies): relative change lower 20% -0.10%; upper 80% -0.14% from 1 RCT study and other

				study --CBA reported no change for poor vs non poor.
Use of 4 or more ANC visits	5.5% to -0.01%	3(Binyaruka et al., 2015; Mwase et al., 2020; Brennar et al. 2020)	⊕⊕⊕⊕ Low	PBF may have desirable effect. 1 CBA no effect for the last two months as assessed Sensitivity: 1 RCT indicates -0.01 to -0.06 Subgroup analysis (2 studies): With additional demand side incentives to offset OOP expenses effect indicates -0.06% Subgroup by wealth groups (1 study): relative change lower 20%; 0.03%; upper 80%; -0.10% for 1RCT (risk of bias concerns)
Use of Family Planning methods	0.18 to -1.80	6(Binyaruka et al., 2015; Mwase et al., 2020; Bonfrer et al. 2014a; Kuunibe et al.,2020; Brennar et al.,2020; De Walque et al., 2017)	⊕⊕⊕⊕ Low	PBF may have desirable effects Sensitivity assessment: 2RCTs 1 relative change 0.18 and 1 relative change could not be calculated reported increase in use of family planning relative to control data from facility register. Subgroup analysis (2 studies); With additional demand side incentives to offset OOP expenses relative change indicates -0.19% for 1 RCT study (concerns with risk of bias) Subgroup by wealth quintile (1 RCT study) relative change lower 20% -0.193%; upper 80%; -0.33%
Family planning counselling on contraceptive options	N/A	1(Brennar et al., 2020)		Not possible to extract, only one study reported on this

Most studies had limitations on one or more aspects of risk of bias and indirectness (as most did not directly meet the PICO assessment in terms of reporting the mediating effect or disaggregating data correctly) and inconsistency

*The RCT study that reported on subgroup for almost all indicators had concerns for risk of bias and reported contextual limitations and timing of data collection

*Subgroup for additional demand side incentives implies either conditional cash transfer support, community-based program exempting poor and/or user fee exemption policy for the poor or specific policy on user fee exemption following PBF implementation

Definitions from EPOC Group below on the grading of the evidence [36]

High = This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different[†] is low.

Moderate = This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different[†] is moderate.

Low = This research provides some indication of the likely effect. However, the likelihood that it will be substantially different[†] is high.

Very low = This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different[†] is very high.

[†] Substantially different = a large enough difference that it might affect a decision [36]

5.3 Effect on Skilled Birth Delivery

All 10 studies (from five countries) reported on skilled birth delivery. There was moderate evidence from two CBA studies from Tanzania that measured the probability of paying OOP expenses for skilled birth delivery and relative effect indicates that PBF may decrease OOP expenses for skilled birth delivery by 31 to 42% (see Table 3.4). The two studies from Tanzania indicates PBF relative effect on OOP expenses may probably improve skilled birth delivery by 9.4% and in public facilities by 8.3% [19,45]. Low certainty evidence from three studies (two RCTs and one CBA) that measured the effect of PBF on skilled birth delivery without reporting the mediating role on OOP expenses indicates PBF may improve skilled birth delivery from as low as 0.05% to 5.6% [49,51,53]. Three CBA studies reported on PBF effect on skilled birth delivery in public facilities [19,44,45], whereas four other studies (two RCTs and one ITS) reported no significant change in institutional deliveries [49-52]. However, one ITS study from Malawi reported on a higher baseline utilization of skilled birth delivery of 90% [50]. In a pilot CBA study in Burundi, an increased percentage of institutional deliveries was reported, which was limited to selected provinces, but no impact on this indicator when the study was extended at the national level [43,44]. With PBF additional equity-enhancing components as reported in one RCT study, it may slightly decrease utilization of skilled birth delivery as low as 0.009% [53].

5.4 Effect on Antenatal Care Visits

Almost all studies reported high baseline utilization rates for the first ANC visit, ranging between 78% and 96% with low certainty of evidence. Although PBF had little or no impact on this indicator, an observed increase in the quality of ANC provided was reported, represented as increased consumption of anti-tetanus vaccines [43,44,53], antimalarial drugs [19,45,50], and iron-based medications [45,53], which are all components related to ANC care. Four studies reported on the use of ANC visits; PBF may lead to little or no difference in ANC visits ranging from 1.14% to 3.3% [44,45,50,51]. Moreover, three studies reported on ANC visits in the 1st trimester, with little or no difference indicating a relative change of

0.08% or slightly reduce by 0.1% [44,50,53]. In one C-RCT study, with an additional enhancing financing mechanism, it slightly reduces utilization of ANC in the 1st trimester by 0.1% [53], however, study reported limitation in power [53]. Three studies reported on the use of four or more ANC visits, PBF may improve utilization by 5.5% and in some context, it may slightly reduce it by 0.01% [45,50,53]. In one RCT study, with additional enhancing financing mechanism, it slightly reduces four or more ANC visits by 0.06% [53]. For the interrupted time series, the average monthly provision of ANC increased in Burkina Faso with the implementation of the nationwide free program [49]. No study reported on ANC visits in the second and/or third trimester. Rather, they focused more on the use of more than one ANC or any ANC, which does not help capture appropriate trends in utilization to monitor and understand the breakpoints and relevant gaps in access and utilization. One CBA study reported a greater effect on the probability of paying OOP expenses during ANC but a positive effect on the probability of giving gifts during ANC [45].

5.5 Effect on Family Planning

Seven studies reported PBF effect on family planning with low certainty of evidence [43,45,47,49-51,53]. The relative effect of two studies (CBA and a C-RCT) indicate PBF may improve utilization of family planning by 0.18% and in another study, it may decrease utilization by 1.8% [45,53]. In the C-RCT study, with additional equity elements, the relative effect may decrease utilization of family planning by 0.19% [53], study reported limitation on power. Three other studies that relative effect could not be calculated reported an increased use of modern family planning [43,50,51], and one study reported no impact on family planning with limitations on power and the timing of data collection [50]. One study reported on family planning counseling [50]. In a pilot study in Burundi, an increase in the use of family planning was reported, which was limited to selected provinces, but no impact on these indicators when the study was extended at national level [43,44]. In Burkina Faso, the average monthly provision of family planning increased with the implementation of the nationwide free program [49].

5.6 Impact on Equity

Of the 10 assessed studies, five [17,44,46,49,53] reported on the distributional effect of PBF by wealth group. All study countries (i.e., Tanzania, Burkina Faso, Burundi, and Malawi) implemented some form of a user fee exemption intervention either as a national policy exemption, demand side financing, or additional community-based insurance targeting poor individuals. All studies used household characteristics and asset ownership to categorize wealth groups into various quintiles. One CBA study further used Andersen et al. predisposing and enabling characteristics to define the population groups [17]. However, none of the studies provided a definition of poor in the context of PBF vis-à-vis the context of the study in relation to the scale being used. One C-RCT study noted this as a limitation that the wealth grouping in their study did not match the characteristics of those targeted as poor individuals in the PBF community-based program [53].

A Tanzanian study reported increased utilization of institutional deliveries among women from the intermediate wealth quintile and uninsured households likely due to the increased adherence to user fee exemption in public facilities and the improved availability of drugs [17,19]. An indication of a pro-poor effect on the rate of institutional deliveries in public facilities was reported in Tanzania, with a change in health care cost amongst the poor and intermediate households and women in rural districts but not among the least poor [17,45]. Some limitations were reported in the statistical power and timing of data collection in one of the studies [17]. In Burundi, an increase in the proportion of institutional deliveries, especially among better-off individuals, was reported, but there was no effect on poor individuals and no changes in the place of residence were found [44].

In Burkina Faso, relative effect of one C-RCT study on utilization of ANC in the first trimester had a slight improvement (0.10%), for the lowest quintile and a slight decrease (0.14%) for the highest quintile [53]. There was a similar pattern for four or more ANC visits and a slight improvement (0.03%) in utilization for the lowest quintile and decreased (0.10%) for the highest quintile [53]. With additional financing incentives, the study reported a slight decrease across all income groups in utilization for family planning with a relative effect of 0.19% for the lowest quintile and 0.33% for the highest quintile [53]. Following the abolishing of user fee in Burkina Faso, the Ministry of Health removed the additional

payments for equity interventions that were targeted for certain groups of population and services [53].

The equity interventions did not generate additional benefits compared to PBF alone for women and those from the poorest category [49,53]. Some potential contextual limitations reported in relation to inadequate human resources and structural constraints--delay in payments and previous experience in the poor implementation approaches [49,53].

For skilled birth delivery, there was a slight increase in utilization among the highest quintile (0.0007%) and slight decrease for the lowest quintile (0.0001) [53]. The study reported some power and contextual limitations as the study data were collected about one year after the launch of the national free healthcare policy targeting women, which also influenced PBF equity measures as some additional compensation was abolished which may have also demotivated health workers from exploring innovative approaches to stimulate demand [49,53]. Similarly, in the Democratic Republic of the Congo, abolishing additional compensation was reported to have demotivated workers and increased the rate of staff absenteeism [52].

In Burundi, there was no indication of heterogeneity of effects for ANC and family planning by poverty status [43], no improvement in institutional deliveries, no difference between public and private facilities as reported [44]. However, an increase in institutional deliveries was reported among nonpoor individuals (wealthier group), but no effect was found among poor individuals [44]. It was also observed in the study from Burundi that although the user costs have been waived, the transportation costs may have likely affected the ability of poor women to deliver in a health facility [44].

6. Discussion

Generally, the evidence is of low certainty. We identified that PBF as a stand-alone supply side strategy can motivate providers to reduce OOP expenses for certain maternal services, for example the cases in Cameroon, and DRC. However, the reduction may not stimulate demand to generate impact on utilization due to other contextual and individual demand side barriers. In settings in which a policy of free health

care at the point of use have been instituted, such as in Tanzania, or in which maternal services have been subsidized such as in Burkina Faso, PBF may likely facilitate or enable the utilization of skilled birth delivery as reported in Tanzania. While the effective implementation of the free health care policy or subsidized services may be hindered by other operational barriers at the health facility and other hidden costs—PBF may facilitates the removal of such operational barriers to enhance utilization of services especially in public facilities.

6.1 Impact on Access and Utilization

Based on the earlier stated PBF assumption, PBF is considered a behavioral change mechanism whereby providers are motivated with incentives through policy changes (contextual enabling characteristics) to stimulate demand by a change in cost (as one of the possible pathways), thereby increasing the ability of individuals to access services based on affordability (individual enabling characteristics) and quality of care [19, 28]. According to the Andersen et al.'s framework, these contextual and individual enabling characteristics are a function of potential access, which may be either equitable or inequitable [28]. Thus, any PBF policy on OOP expenses is an instrument of potential access. However, these policy strategies are also approached differently by health facilities and health sectors to enhance the individual enabling characteristics towards improving access. In general, pathways from PBF for OOP included incentives to providers to stimulate demand, exemption of user fees for a specific population group, availability of drugs, and the use of demand-side strategies like conditional cash transfers and in some situation, the provision of transportation to enhance access which are also enabling organizational characteristics which varied by facility. These enabling characteristics thus translates to realized access, which is the actual utilization of services. Most studies reported an improvement in the availability of drugs, which is an indicator of potential access in terms of an indirect potential reduction in OOP expenses for women who otherwise need to purchase drugs from the private sector, which is expensive [19]. In some countries, PBF favored individuals from the middle-income and sometimes high-income quintiles, and in limited cases those from the low-income quintile. One question, however, is how this translates to effective access, which is a function of both potential and realized access.

In Tanzania, PBF was found to be effective in re-enforcing the user fee exemption policy and led to an immediate increase in the utilization of skilled birth delivery, with an even greater increase observed in public facilities [19,45]. In Malawi, PBF was found to be effective in improving access to ANC because of “resilience against interrupted supply chains and improvements in attendance rates” [50]. PBF was also found to be effective in the timing of ANC during the first trimester in some countries [50,53], and for even more than four ANC visits in some contexts [44,50], but not among the poor quintile for more than four ANC visits in Burkina Faso [53]. In Burkina Faso and Burundi, an inequitable increase in utilization was observed among nonpoor individuals [44,49,53]. In the Democratic Republic of the Congo, despite the increased efforts by providers in the reduction in prices, it did not increase utilization, suggest poor innovative strategies employed by providers to stimulate demand given an existing poor level of satisfaction toward the quality of services, especially when most of the population are poorly educated and informed [52]. In Burkina Faso, poor implementation approaches and delay in payments was reported [49]. In Cameroon, the increased efforts made by providers to reduce user fees, including reductions in the prices of laboratory services and significant reductions in informal fees, among other efforts, did not lead to any significant change in the level of utilization for antenatal care and skilled birth delivery, suggest existing high OOP expenses [51].

7. Policy Implications

User fees provide a broad focus on equity in accessing services and financing healthcare and reducing OOP expenses through user fee exemptions or policies is an important element or policy toward achieving UHC. The evidence on the effect of PBF as a way of reducing financial barriers like reducing OOP expenses to improve access is low and of poor quality. This is especially the case when isolating the effect of PBF as a supply side strategy from other demand side strategies like conditional cash transfers and/or policy such as removal of user fees.

PBF designs may appear to be similar, but implementation varies by context and contextual characteristics seem to play a major role in determining the outcome of the PBF. Based on the findings,

both context with existing high OOP expenses and those with free or subsidized services, and/or combined implementation of CCT and supply, the effect on equity was not significant and, in some context, there was no effect on equity. Therefore, it is important to carefully design PBF interventions to align with country specific problems and context and or assess other strategies that may generate the same results with significant effect on equity. OOP is an indicator to assess equity and important to incorporate all elements of OOP to understand various equitable and inequitable process changes-- if a policy is not impacting on the poor or addressing equity concerns it is important to review and re-strategies. Considering that PBF is an add-on to an existing payment mechanism--the mixed results of PBF and possible administrative cost implications in the implementation--is worth assessing the value for money if PBF is an efficient policy mechanism within specific context to enhance access to maternal health services which most studies did not assess and this presents a research gap.

Health facilities with high costs may have considerably reduce OOP expenses because of PBF. However, this reduction may not necessarily have a positive impact on access because these facilities have high OOP expenses, and any reduction is likely “high” among certain population groups, especially among income groups that are more responsive to changes in costs, coupled with other potential social determinants of health factors. Thus, individuals belonging to the middle-income group may tend to benefit more because any change in costs is relatively moderate for this group. Moreover, the PBF definition on equity aspects has not been well studied⁵⁵. For example, as reported in one of the studies, the classification of poor was not in line with the PBF community approach [53]. There is a need to clearly define the “poor” within each context and align with the PBF definition of who constitute the poor, to ensure appropriate classification and reporting to inform policy intervention strategies towards achieving universal health coverage. PBF is a behavioral change mechanism and therefore poor implementation approaches and delay in payments can potentially demotivate health providers from making efforts to stimulate demand and reduce out-of-pocket expenses to reach out to the poor and address inequities.

Additionally, the high baseline rate of at least one ANC visit (78 to 96%), which may not likely reflect ANC visit in the 1st trimester, can be leveraged as a medium to improve on continued care for subsequent ANC visits to enhance continuity of care as a quality criterion.

8. Methodological Considerations and Study Limitations

Given the study designs, some level of bias is observed in all studies included in this review. There exist substantial differences in terms of reporting of effect estimates, intervention designs, outcomes, study groups which precluded statistical pooling of the results. The effect estimates reported for PBF on OOP expenses were not often presented for the public and private sectors, some studies rather, controlled for it and ignored the opportunity assess for any potential differences. Most importantly, PBF has been implemented in most countries over reasonable period with some policy changes and adaption are ongoing [56], it is important for research to focus on designing and collecting new data to assess the policy over time and not focused more on data from the pilot studies which may have its own limitations. Moreover, most pilot studies are designed and conducted in an ideal situation, therefore, the findings may not reflect the actual implementation processes and challenges over time. This implies there is limited evidence to inform relevant areas of the policy that may require revision or adoption to support advocacy and sustainability.

The results of AMSTAR from the two independent reviewers indicates moderate quality rating which implies more than one non-critical weakness but no critical flaws. This implies the review may provide an accurate summary of the results of the available studies that were included in the review [39]. The weakness areas of this review as per AMSTAR tool were the limitation of not conducting a meta-analysis to enable an assessment of publication bias and we did not assess funding [sources from the individual sources](#) [39].

One of the strengths of this systematic review are its focus on sub-Saharan Africa which is focused on assessing the PBF induced effect on OOP to improve access and utilization of maternal services [29,30]. This review initially aimed at updating some outcomes of the Cochrane review [57].

However, the Cochrane review [22] was updated and published during the review process. It should be noted that as a strength to this review, a cross section of the studies that are included in this review are not yet included in the summary of findings of the Cochrane review especially those studies published after 2018. This provides a strength to the review. Finally, the dimension of access should be interpreted with caution and is focused specifically on discussing the PBF assumption on OOP expenses as used in this review and based on what was reported in the studies which may not comprehensively reflect what is being implemented in the count.

9. Conclusion

Generally, the results obtained are mixed with important contextual differences and implementation approaches. As an add-on to an existing payment mechanism, PBF may facilitate or enable the utilization of skilled birth delivery in some context. PBF facilitates the removal of operational barriers to enhance utilization of services especially in public facilities. While the implementation of PBF can be considered a potential access instrument in reducing out-of-pocket expenses to stimulate demand for maternal services. However, the implementation approaches employed will determine utilization, taking into consideration existing equitable and inequitable access characteristics which also varies by context.

Contributions: MN conceived the idea for the systematic review, conducted screening, data collection, analysis, investigation, methodology, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. OO assisted in the screening and data collection. RD, RP, RG and OO critically revised the manuscript and provided feedback. All authors reviewed and agreed on the final version of the manuscript.

Acknowledgement: We would like to thank the Librarian Lindsay Sikora at the university of Ottawa who provided support, advise and peer review in developing the search strategy. We would also like to thank Nigussie Assefa for providing feedback on the statistical approach.

Funding: No funding was provided for this review

Competing Interest: None declared

Patient and Public Involvement: No patient or public involvement

Data Availability: All data relevant for the study is included in the review and/or attached as supplementary material

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Supplemental Tables

Table 3.5. Risk of bias using EPOC criteria, rated high, unclear, low

Studies	Was the intervention independent of other changes?	Was the shape of the intervention effect pre-specified?	Was the intervention unlikely to affect data collection?	Was knowledge of the allocated interventions adequately prevented during the study	Were incomplete outcome data adequately addressed	Was the study free from selective outcome reporting	Was the study free from other risks of bias? (Cofounders and seasonality)
Brennar et al., 2020	Unclear (not specified)	Low (defined as per guidance)	Low (same data source)	Low	Unclear	Low (no indication)	Low (adjusted for seasonality and auto correlation)
Kunnibe et al., 2020	Unclear (not specified)	Low (defined as per guidance)	Low (same data source)	Low	Low	Low (no indication)	Low (adjusted for cofounders, auto correlation)

Table 3.6. Within-study risk of bias in controlled before-and-after studies

Study	Allocation sequence adequately generated?	Allocation adequately concealed?	Were baseline outcome measurements similar?	Were baseline characteristics similar?	Were incomplete outcome data adequately addressed?	knowledge of the allocated interventions adequately prevented during the study	Was the study adequately protected against contamination?	Was the study free from selective outcome reporting?	Was the study free from other risks of bias? (Adjusted for confounding, seasonality etc.?)
Anselmi et al, 2017	High (as per criteria)	High (as per criteria)	Low (analysis adjusted for potential differences)	Low (comparable)	Unclear (not clearly specified)	Low (objective outcome)	Low (facility received intervention)	Low (no indication)	Low (controlled for confounders)
Ashir et al., 2013	High (as per criteria)	High (as per criteria)	High (as per criteria)	High (as per criteria)	Unclear (not specified)	Low (objective outcome)	Low (facility & community)	Unclear (not specified)	High (as per criteria)
Binyaruka et al., 2018	High (as per criteria)	High (as per criteria)	Low (analysis adjusted for potential differences)	Low(comp arable)	High (as per criteria)	Low (objective outcome)	Low (facility received intervention)	Low (no indication)	Low (controlled for confounders)
Bonfrer et al.,2014a	High (as per criteria)	High (as per criteria)	Low (analysis adjusted for potential differences)	High (some differences in the districts)	Unclear	Low (objective outcome)	Low (facility received intervention)	Low (no indication)	Low (controlled for confounders and time variant
Bonfrer et al.,2014b	High (as per criteria)	High (as per criteria)	High (as per criteria)	Low(comp arable)	Unclear	Low (objective)	Low (facility intervention)	Unclear (P-values no CI	low

Binyaruka et al., 2015	High (as per criteria)	High (as per criteria)	Low (analysis adjusted potential differences)	Low(comp arable)	High (authors suggested it may have biased results)	Low (objective outcome)	Low (facility received intervention)	Low (no indication)	Low
Canavan 2010	High (as per criteria)	High (as per criteria)	High (as per criteria)	High (as per criteria)	Unclear	Low (objective outcome)	Unclear	Unclear	High (as per criteria)
Chinkhumb a et al.,2017	High (as per criteria)	High (as per criteria)	Low	Low(comp arable)	Low	Low (objective outcome)	Low (facility received intervention)	Low (no indication)	Low (controlled for confounders)
Brennar et al., 2018	High (as per criteria)	High (as per criteria)	Low (analysis approach)	High (as per criteria)	Low	Low (objective outcome)	Low (facility received intervention)	Low (no indication)	Low (controlled for potential confounders)

Table 3.7. Within-study risk of bias in RCT studies

Study	Allocation sequence adequately generated	Allocation adequately concealed	Were baseline outcome measurements similar?	Were baseline characteristics similar	Were incomplete outcome data adequately addressed?	knowledge of the allocated interventions adequately prevented during the study	Was the study adequately protected against contamination?	Was the study free from selective outcome reporting?	Was the study free from other risks of bias? confounding, seasonality?
De Walque et al.,2017	Low (Public randomization)	Low (blinded)	Low (analysis adjusted for potential differences)	Low	Unclear	Low	Low	Unclear (inconsistency in reporting some outcomes)	Low
Fergusoh et al., 2020	Unclear	Unclear	Low	Low	Low	Low	Low	Unclear (P-value reported without CI)	Low
Huillery & Seban, 2014	Unclear	Unclear	Unclear	Unclear	Unclear	Low	Low	Unclear	Low

Table 3.8. Within-study risk of bias in cluster RCT studies

Study	Allocation sequence adequately generated	Allocation adequately concealed	Were baseline outcome measurements similar?	Were baseline characteristics similar?	Were incomplete outcome data adequately addressed?	Knowledge of the allocated intervention adequately prevented during the study	Was the study adequately protected against contamination?	Was the study free from selective outcome reporting?	Was the study free from other risks of bias? confounding, seasonality?
Mwase et al., 2020	Low	Low	High	Low	Unclear	Low	Low	Low	High (authors reported power limitation)
Cross Sectional Study									
Study	Allocation sequence adequately generated?	Allocation adequately concealed?	Were baseline outcome measurements similar?	Were baseline characteristics similar?	Were incomplete outcome data adequately addressed?	knowledge of the allocated intervention adequately prevented during the study	Was the study adequately protected against contamination?	Was the study free from selective outcome reporting?	Was the study free from other risks of bias? (Adjusted for confounding, seasonality etc.?)
Egbe et al., 2016	High (as per criteria)	High (as per criteria)	High	Low	Low	High (self-reported)	High (reported potential contamination)	Low	Low (controlled for confounders)

Chapter 4

Examining the Effect of Performance-Based Financing on Out-of-Pocket Expenses for Antenatal Care and Skilled Birth Delivery Across Health Sectors in Cameroon

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1. Preface

This chapter reports on the second objective of my dissertation, which was to examine the effect of PBF on OOP expenses to improve access to maternal health services across health sectors in Cameroon. This chapter is a before-and-after study design using secondary data on costs collected from health facility administrators and primary data collected from women attending antenatal care and skilled birth delivery. The chapter provides a situational report on the impact of PBF on each OOP element as reported by respondents. It expands on the results of the impact evaluation and provides a picture of the effect on cost for each studied variable by attempting to unmask potential heterogeneity across settings. I conceived and designed the study and collected data from the field, assisted by research assistants. I performed the data analysis and interpretation. Drs Yaya and Little supervised the design and methodology and critically revised the manuscript. Dr. Deonandan provided valuable methodological and subject matter expertise and revised the manuscript. All authors read and approved the final manuscript, which has been submitted to BMJ Open.

Status of the Manuscript: Submitted to BMJ Open

Ethics Approval: Required and was Approved

2. Abstract

Background: An impact evaluation of performance-based financing (PBF) in Cameroon in 2012 indicated a reduction in household OOP expenses and informal fees, but this reduction did not impact on access to, or utilization of antenatal care and/or skilled birth delivery. There was no change in formal fees (except for laboratory and x-ray fees). However, the evaluation did not assess variation in effect across sectors although cost and care delivery is known to vary substantially between sectors. Impact evaluation generates average effects and can mask potential heterogeneity across sectors and settings. This is an important evidence gap and thus the evaluation did not reflect the context of the heterogeneous nature of the health system in Cameroon.

Objective: To compare the costs associated with antenatal care, skilled birth delivery, and family planning before and after the implementation of PBF, by sector.

Method: Before-and-after design in three districts (Limbe, Tiko, Buea) in the Southwest region of Cameroon, based on (1) secondary data on costs related to antenatal care and skilled birth delivery obtained from records of health facilities; and (2) primary survey data obtained from women who were pregnant and attending antenatal care or delivered during the study period. All the 90 health facilities from the PBF list were eligible from which 834 women were sampled.

Result: 13/90 facilities could not be included because they were not accessible due to the ongoing conflict. Of the 77 facilities included in the study, 38 were public, 25 private, 10 para public, and 4 confessionals. 735 women completed the survey. Both survey and facility results indicate the cost for the first ANC and associated laboratory test increased in Limbe with a statistically significant increased and mean difference of 677frs CFA ($p < 0.5$), and in Tiko an increased in health facilities with mean difference of 2,792frs CFA ($p < 0.05$). This increase was reported because of the introduction of additional tests for example hepatitis B screening that were not part of a routine ANC screening for the first ANC before PBF. Of the 735 analyzed survey responses, cost for iron supplement and anti-malaria pills have

decreased. A general increase in C-sections was observed in all districts. Normal delivery increased in confessional facilities due to additional quality indicators to enhance quality.

Conclusion: PBF reduced OOP for routine medications during antenatal care visits and for echography.

However, the cost for laboratory tests associated with the first ANC visit increased in two of the three districts, specifically in confessional facilities because of the increase in the number of tests, purported to enhance quality.

Key Questions

What is Already Known on this Topic?

- High out-of-pocket expenses in Cameroon continue to impede access to antenatal care and skilled birth delivery
- Impact evaluation generates average effects and can mask potential heterogeneity across sectors and settings

What are the New Findings?

- The cost for associated laboratory test during the first ANC increased across districts in some health sectors because of the increase in the number of tests intended to enhance quality.
- There is substantial heterogeneity in cost for antenatal care and skilled birth delivery across health sectors
- The operational definition of poor and vulnerable in the PBF implementation is not well articulated

What do the New Findings Imply?

- The increased in the number of tests likely inflated OOP expenses for routine first ANC and its associated laboratory testing. Therefore, as PBF attempts to improve quality, and subsidizing user fees to reduce OOP expenses, there is an indirect impact on cost for ANC and skilled birth delivery especially in a setting with an existing high OOP expense.

3. Background

The economic crises in the late 1980s stimulated healthcare reforms in most African countries. Amongst these reforms was the institutionalization of user fees [1-6], promoted from the Bamako initiative, which requires households to make out-of-pocket (OOP) payments including formal and informal fees [1-7]. Formal or direct expenses are defined as fees for medications, contraceptives, laboratory tests, provider services, facility fees, and transportation expenses and exclude any prepaid payments such as insurance fees, and informal fees are additional payments(unofficial) made to the official payment [8-10]. This introduction of OOP expenses was entirely new to most citizens who had formerly received some of these services for free [1-7,10]. This introduction of user fees has been considered to be a reasonable initiative to aid the sustainability, efficiency, and effectiveness of the healthcare system [1-7,10]. In contrast, it is evident that an over-reliance on such OOP payments as experienced in sub-Saharan African countries has adverse consequences in terms of access to essential services like maternal and child health, especially amongst the lowest income quintile [1-7,10].

In Cameroon, the public sector is the most important provider of healthcare. However, in 2018, more than two thirds of the funding for the health sector was generated from OOP payments [11]. The private sector also is an important source of healthcare delivery, and includes traditional healers, private for-profit health facilities, and confessional health facilities. The confessional health facilities include faith-based organizations of Catholic, Presbyterian, Pentecostal, and Baptist origins. These private organizations differ in how they deliver care, their organizational culture, and the extent of OOP expenses for maternal health services.

In 2012, Cameroon implemented a performance-based financing (PBF) program, which provides incentives to providers based on predefined quality and quantity criteria as a strategy for achieving universal health coverage. Part of the rationale for introducing PBF in Cameroon is related to the high OOP expenses, and inefficiency in the distribution of financial resources [12]. Subsidizing user fees is one of the PBF equity instruments which aims at reducing OOP expenses and thus, enhance financial

protection and increase the utilization of maternal services [13,14]. In 2012, an impact evaluation of the PBF program was performed in Cameroon during which facilities were randomly selected and assigned to various intervention and control groups [15]. Further information on this is published elsewhere [15]. The results of the impact evaluation indicate a significant reduction in household OOP expenses and informal fees, but this reduction did not impact access to and utilization of antenatal care and skilled birth delivery [15]. This was a concern especially as antenatal care and skilled birth delivery has not improved in Cameroon for the past two decades [15], thus, underscoring the foundational notion of PBF as a policy targeting OOP expenses in order to improve access. There was no significant change in formal fees (except for laboratory and x-ray fees) [15]; however, the evaluation did not assess PBF effect across sectors which differ in cost and care delivery. Thus, the impact evaluation did not report effect estimates due to PBF intervention specific to the public and private sectors and/or any differences in cost across sectors but rather controlled for these differences [16]. This lack of assessment of differences between sectors present an evidence gap in reporting and does not reflect the actual context given the heterogeneous nature of the health system and the important role that each sector plays in the delivery of healthcare in Cameroon to inform relevant policy towards achieving universal health coverage.

The rationale for selecting antenatal care and skilled birth delivery as the main variables of interest is the important role that these two variables play as indicators in reducing maternal mortality [15,20,21]. Second, in Cameroon, these two variables have not improved by more than 2% for the past two decades and remain a concern, and OOP expenses play an important role in accessing antenatal care and skilled birth delivery in Cameroon [11,15,22]. With the current COVID-19 pandemic, this effect has been compounded and affected access and utilization of antenatal and skilled birth delivery [23]. Moreover, with the introduction of PBF some services for ANC and skilled birth delivery are provided free of charge or at a reduced rate for a specific population group known as the poor and vulnerable (PAV). The PBF equity program introduced this PAV category as an additional intervention that was not a standard practice before the implementation of PBF as reported by most health facilities. These PAV are

provided services for free or at a very reduced rate at the point of care, and this is based on certain criteria determined by the health administrator. This was not assessed or reported in the impact evaluation results. Most impact evaluations are designed to estimate the average effect, which can potentially mask important heterogeneity across health sectors, service users, and providers [17]. Of note, randomized controlled trials have limited generalizability [17,18]. The use of multiple methods of observation can reveal different aspects of empirical realities [19]. Therefore, this study employed a before-and-after study design to further validate and expand on the existing findings of the impact evaluation on the effect of PBF on OOP expenses, with a focus on antenatal care and skilled birth delivery across health sectors. This paper therefore (i) investigates and characterizes the pre- and post-OOP expenses for antenatal care and skilled birth delivery from health facilities across sectors and (ii) examines the cost of antenatal care and skilled birth delivery from women attending antenatal care and/or skilled birth delivery at the time of the study across sectors.

4. Materials and Methods

4.1 Study Setting

Cameroon is a lower-middle-income country and mainly finances healthcare through OOP expenditure. It has a decentralized health system with a pyramidal structure that consists of the operational, regional, and central levels [20]. The health policies are defined at the central level by the Ministry of Public Health, the regional level translates the health policies into operations, and the district level operationalizes the health policies into action. Based on data from 2016, Cameroon has 10 regions, 189 health districts, 1,800 health areas, and approximately 5,166 public and private health facilities [20]. There are seven main categories of health facilities: general hospitals, central hospitals, regional hospitals, district hospitals, district medical centers, integrated health centers, and ambulatory health centers [20]. In 2020, the population was approximately 26 million [24]. Women comprise about 50% of the population, and life expectancy at birth was 59 years as of 2021 [24]. In 2019, the country's GDP was about \$39 billion USD,

and the GDP per capita was \$1,502 USD [25,26]. The proportion of GDP spent on healthcare was 3.6% in 2019, with more than two thirds derived from OOP expenses and the remainder from external aid (14%), government transfers (3%,) voluntary health insurance (7%) and other sources (3%) [25].

In 2014, the maternal mortality rate was 590 per 100,000 live births [20,21]; skilled attendants were present at 64% of births, a proportion that remained unchanged in 2018 [15,20,21]. Based on a World Bank report, COVID-19 caused the use of family planning and prenatal care services to decrease by 37% and 18%, respectively [23].

This study was conducted in one of ten regions--the Southwest region (SWR) of Cameroon, which is one of the regions currently undergoing an armed conflict. The rationale for selecting the districts (Limbe and Buea) in this region is because it was included in the pilot study and most of the health facilities were included in the impact evaluation. It should be noted that all the two English regions are undergoing conflict however, this region is relatively calm. The Ministry of Public Health estimated that the population of the region was 1,817,667 in 2018. The main sources of income are farming and fishing. The region comprises 18 health districts, 116 health areas, and 308 health facilities (2 regional hospitals, 12 district hospitals, 17 sub-divisional hospitals, 167 integrated health centres and 110 private health facilities).

4.2 Study Design

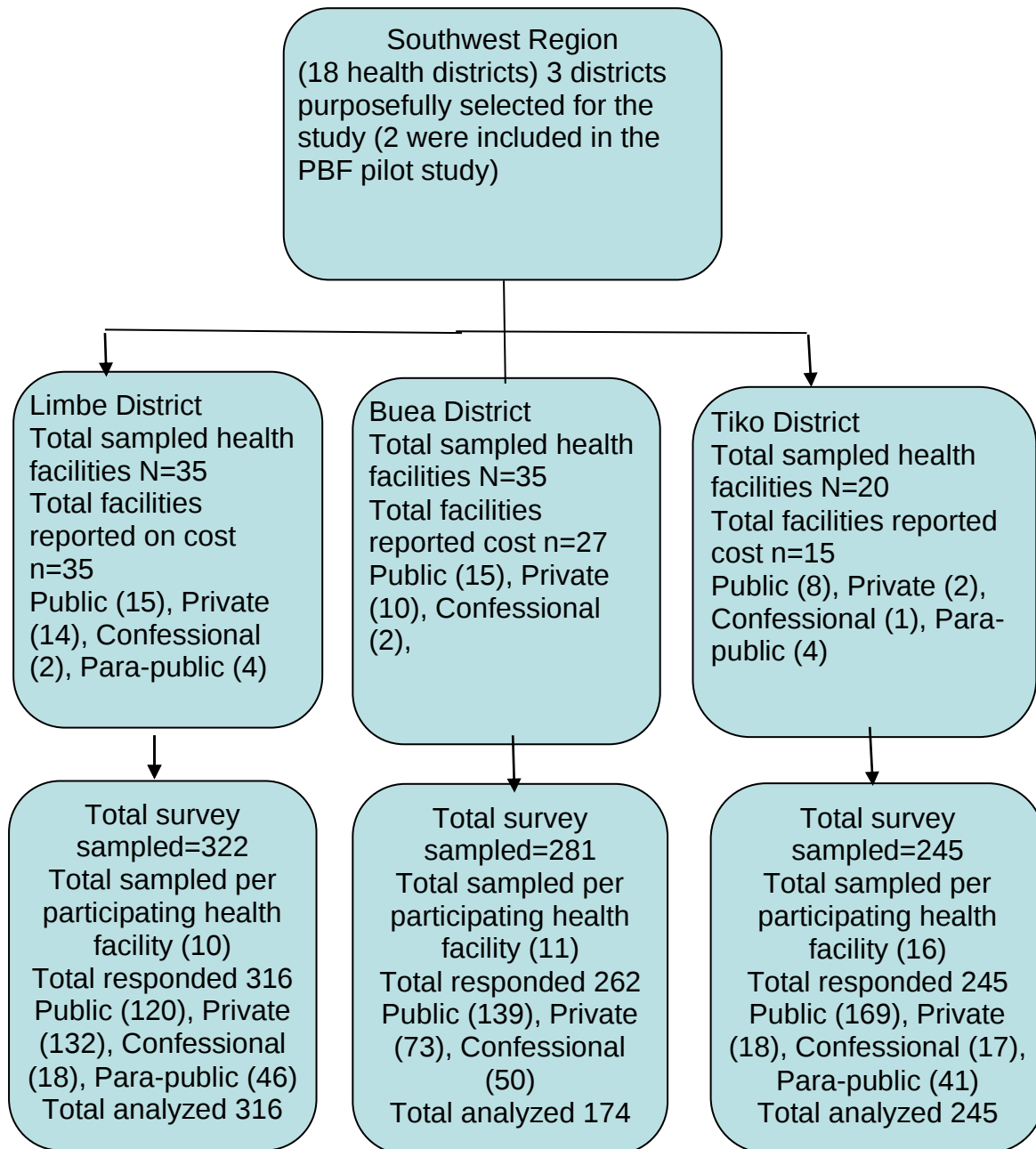
The study is a before-and-after design. The before-and-after study design is commonly used in situations where it is practical and ethically challenging to randomize participants [26]. PBF is implemented in all health facilities in Cameroon, so it was not possible to establish a parallel control group. The study was designed to answer the following questions using data collected from the health facilities: (i) What are the associated costs for antenatal care, skilled birth delivery, and family planning before and after PBF across sectors? (ii) Is there any difference or change in the cost for each OOP item before and after PBF for the above variables within and across sectors? (iii) What is the magnitude of the change? (iv) Is there any difference in cost for the variables across districts? The study collected secondary data from health

facilities before and after PBF and cross-sectional primary data from women who were pregnant and attending antenatal clinics, or who gave birth in a health facility, at the time of the study.

4.3 Sampling and Data Source

Three districts, Limbe, Buea, and Tiko, were purposively selected. Two of these (Limbe, and Buea) had been included in the PBF impact evaluation [15] in 2012. All 90 health facilities in the three selected districts were eligible for inclusion. Data collection was undertaken from May to August 2021 and focused on OOP expenses for; i) medication costs, specifically iron supplements, and anti-malaria pills during ANC visits; ii) contraceptive fees; iii) ANC cost and associated laboratory fees specifically for ANC in the first trimester, including echography fees; iv) consultation fees for subsequent ANC visits; and v) provider's fees or fees related to C-sections as well as the cost of C-sections and normal delivery. Cost information was provided by the health facility administrators (the researcher was not given access to directly extract cost estimates). Costs reported for the period before PBF was implemented could only be validated by interviewing women who had used the facilities in that period. For the period after implementation, cost data collected for skilled birth delivery was validated at the delivery ward, and some health facilities posted their cost list on notice boards, which enabled validation. Data on costs were collected with the help of research assistants.

Figure 4.1. Sampling of health facilities and districts



To validate the cost collected at health facility level before and after PBF was implemented, with the help of the health administrators, we identified women who had used the health facility before PBF and were attending antenatal care visits or undergoing skilled birth delivery during May 2021 to August

2021. The recall period was 3 years. The exit survey consisted of 27 items including demographic questions and OOP expenses as earlier defined and adapted from the United States aid international development questionnaires on OOP expenses [8].

We aimed to recruit a cross-sectional sample of 845 women. This assumed that the proportion of women attending antenatal care at the time of the study was 50% and design effect of 2 with a 95% confidence level that allowed for a margin of error of 5% [27-29]. To account for the nonresponse rate, the sample size was inflated by 10%. We aimed to ensure that the reported experience of costs is representative of women who were attending antenatal clinics and skilled birth attendance at the time of the study. Given that the proportion of women attending antenatal care and skilled birth delivery varies per district, the sample was allocated using proportionate allocation based on the total number of expected deliveries for 2021 (see Fig. 4.1). We also identified PAV with the help of administrators for the exit survey to get a percentage of women receiving free or services at a reduced rate.

4.4 Selection, Definition of Variables and Measurement

The outcome variables are cost before PBF for antenatal care from first to fourth visit, normal deliveries, Cesarean Section(C-Section), Laboratory cost associated with first ANC, medication cost for routine ANC specifically iron supplements and anti-malaria pills, echography cost during ANC visits. Cost is assessed before and after the implementation of PBF through surveys from women attending ANC at the time of the study and from secondary data on cost provided by the health administrators.

4.5 Data Analysis

Cost data collected from health facilities and surveys was entered into Excel and analyzed using SAS and STATA 14. We used a paired T-test to test within-group differences and *Cohen's d* test to assess the magnitude of the effect [30]. We assessed the mean difference between sectors using a one-way analysis of covariance (ANCOVA) and then performed Tukey's post-hoc test to determine the most marked differences between sectors. The results are presented using mean and standard deviations. Data are presented across sectors and districts. For the secondary data, ANCOVA was conducted for Limbe and

Tiko districts to compare the effect between facility type on the cost of first ANC and the associated lab test and normal delivery. The reported cost for Buea district for the first ANC and associated laboratory test and echography was poorly reported and it was not possible to validate the cost before PBF especially as most staff were newly hired and could not provide cost estimate. Therefore, we excluded the cost for first ANC with associated lab test from the secondary data analysis for Buea district. Therefore, only Limbe and Tiko results are reported (Tables 4.2 and 4.3). However, for family planning, Buea district was the only district that provided detailed cost information on the various contraceptive type. Therefore, we assessed the cost for specific contraceptives in Buea district and presented the mean cost in Fig. 4.2.

For the exit survey data, we conducted ANCOVA for all three districts. All missing and incomplete data were excluded from the analysis. A total of 88 responses were excluded from Buea district. We conducted a subgroup assessment for the PAV group and sensitivity analysis to assess if there was any difference in the mean cost after removing all those who were assigned a PAV status.

4.6 Patient and Public Involvement

This study involved pregnant women attending antenatal care or who have delivered at the time of data collection at a health facility.

4.7 Ethics

The Bruyere Research Institute at the University of Ottawa approved the study (# M16-18-057), and administrative clearance was obtained from the Faculty of Science, University of Ottawa (#H-02-19-2829). In Cameroon, we obtained ethical approval from the University of Buea Faculty of Health Sciences (Ref 2020/1342-02/UB/SG/IRB/FHS) and administrative clearance from the regional delegation of public health in the Southwest region (Ref R11 MINSANTE/SWR/RDPH/PS864/715). We obtained informed consent for the survey from all participants who agreed to participate.

5. Results

5.1 Background Characteristics of the Sample Population

Data were not available from 13 of the 90 eligible facilities - one facility from Tiko refused to provide cost data; one from Buea refused to participate; 11 facilities could not be accessed due to the ongoing conflict in the region (4 Tiko, 4 Buea, and 3 Limbe). Cost data were collected from a total of 77 health facilities from the three health districts (35 Limbe, 15 Tiko, and 27 Buea districts) for before and after PBF implementation from the assigned health administrators. Of the 77 facilities, 38 are public, 25 private, 10 Para public, and 4 confessionals (see Fig. 4.1 above). In Buea and Limbe, we accessed 39 facilities that were included in the PBF pilot study, and the other 23 facilities were enrolled into PBF from 2017 onwards following the national adoption policy. All the 15 facilities in Tiko district enrolled into PBF from 2018 onwards. All cost are reported in Francs CFA which is the local currency used in Cameroon and the exchange to the United States dollar at the time of the study was 470frs CFA to US\$1.

5.2 Reported Cost from Health Facilities: Antenatal Care Visit

A general trend in reduction for the second to the fourth ANC visits was reported across all districts and health sectors, and there was a similar pattern for routine medication during ANC (iron supplement and anti-malaria pills) which was significant across districts and sectors except for anti-malaria pills in private facilities in Tiko which was not significant (supplemental table 4.8). Echography also had a reduced cost pattern across sectors and district except Tiko with an insignificant increase (Table 4.1). In some facilities, the first ANC registration is paid in a lump sum, and the cost includes subsequent ANC visits. Most Para-public (public-private partnership) facilities in Tiko and Limbe reported that most maternal services are either subsidized or free for their clients because as a public private cooperation, this is covered under their insurance scheme. The cost for the first ANC and associated laboratory test increased in Limbe and Tiko district with a statistically significant mean difference of 2,792frs CFA ($p < 0.05$) and Limbe 677 ($p < 0.5$). This increase was reported because of the introduction of additional tests like hepatitis B screening that were not part of a routine ANC screening for the first ANC before PBF. However, this difference was insignificant within sector, but with more cost in private facilities (Mean difference 6,400frs CFA) followed by confessional (4000frs CFA) (see Tables 4.2 and 4.3). After controlling for baseline cost using ANCOVA, the results indicate significant differences between sectors

for first ANC $F(3, 23) = 9.67$, $p < 0.05$ in Tiko but no significant difference in the mean cost after intervention. This pattern was similar in Limbe with significant difference between sector $F(3, 64) = 3.86$, $p < 0.05$ but no significant difference in cost $F(1, 64) = 0.47$, $p = 0.4$.

5.3 Skilled Birth Delivery

Most facilities do not conduct C-sections especially paraprofessional. The cost for C-section has increased in all districts but the increase was not significant. However, within districts, there was a reduction in public facility costs in Limbe but an insignificant increase in public and paraprofessional facility costs in Tiko; these changes were not statistically significant. (Tables 4.2 and 4.3). The reported mean cost for a C-section varied by district and sector, with Buea having the lowest cost being for public facilities (44,500frs CFA), than Limbe (101,000frs CFA), or Tiko (150,000frs CFA) (Supplemental Table 4.8). Private facilities had the highest mean cost at up to 143,333frs CFA in Buea and Tiko districts (180,000frs CFA), followed by paraprofessional facilities, with 127,000 and 130,000frs CFA in Buea and Tiko respectively.

The cost of normal delivery decreased for Limbe and Tiko districts, but the decrease was not significant based on paired t-test results, and there was with an increase in Buea (not significant). However, the results from Tiko revealed a significant difference between sectors in the cost for normal delivery after controlling for baseline cost using ANCOVA, $F(3, 21) = 6.53$, $p < 0.05$, but no significant difference in the mean cost $F(1, 21) = 0.29$, $p = 0.5$. Limbe was also different, but the difference was not significant and the cost for normal delivery did not change in paraprofessional facilities.

Table 4.1. Differences in cost of indicators of material care, pre- and post-PBF implementation, as reported by health administrators and by district

Indicators	Limbe District					Buea district					Tiko district				
	N	Mean difference	95% CL Mean		Std Dev	N	Mean difference	95% CL Mean		Std Dev	n	Mean difference	95% CL Mean		Std Dev
C section	5	16666	-21279	54612	15275	7	20714	-16320	57749	40044	5	13000	-3189	2918	13038
Echography	7	-1071.4	-2638	495	1693	16	-	-	-	-	2	1000	1000	1000	0
Normal delivery	34	-2191	-5123	740	8402	27	666	-402	1736	2703	12	-466	-3624	2690	4969
Family Planning	33	-36	-325	252	815	-	-	-	-	-	11	27	-256	310	422
*ANC1	33	677	183	1170	1344	27	-333	-870	204	1358	13	2792	73	5510	4498

*Includes associated lab test

Table 4.2. Differences in cost of indicators of maternal care, pre- and post-PBF implementation as reported by health administrators, Limbe district

	Public Facilities						Private Facilities						Para Public Facilities					
	N	Before Mean (SD)	After Mean (SD)	t-value	P Value	d	N	Before Mean (SD)	After Mean (SD)	t-value	P value	d	N	Before Mean (SD)	After Mean (SD)	t-value	P value	d
Echography	2	9000	4727(3052)	-5.0	0.1	-	5	7500 (1224)	6833 (443)	-0.67	0.5	0.7	-	-	-	-	-	-
Normal delivery	15	9821 (9197)	6100 (4396)	-2.42	0.03	0.5	14	17214 (10045)	14500 (7087)	-0.92	0.3	0.6	4	6750 (8616)	8000 (1009)	1.6	0.1	0.2
Family Planning	15	521 (606)	706 (513)	0.8	0.4	0.3	14	1000 (854)	678 (607)	-1.46	0.16	0.4	4	375 (250)	500 (1)	1.0	0.3	0.7
*ANC1	15	9633 (5508)	10321 (6268)	1.42	0.1	0.1	14	12985 (3518)	14821 (6005)	1.0	0.3	0.3	3	7375 (8518)	7250 (8529)	-0.14	0.9	0.01

*Includes associated lab test. One confessional facility reported cost; ANC1 and associate Lab test increased but insignificant, normal delivery reduced insignificantly but no family planning. Results for C-section could not be analyzed by sector. Echography not conducted in some facilities.

Table 4.3. Differences in cost of indicators of maternal care, pre- and post-PBF implementation, as reported by health administrators and sector, Tiko district

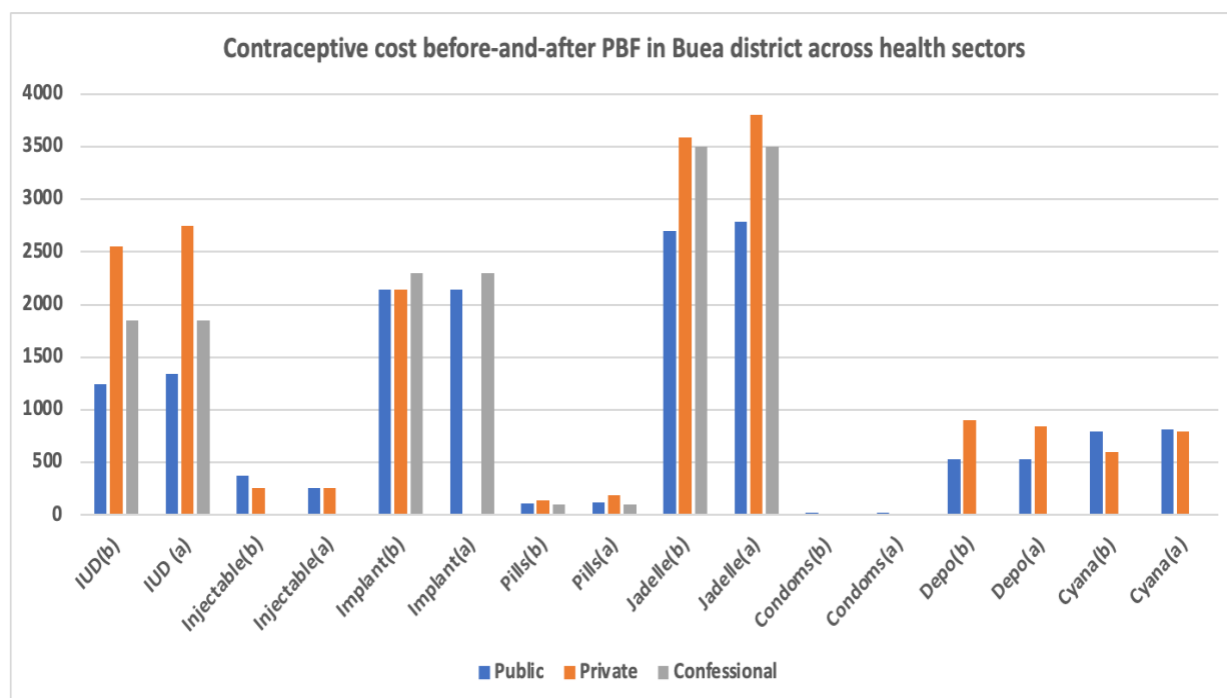
		Public Facilities						Private Facilities						Para-Public					
Indicators	n	Before Mean (SD)	After Mean (SD)	t- value	P value	D	N	Before Mean (SD)	After Mean (SD)	t- value	P value	d	n	Before Mean (SD)	After Mean (SD)	t- value	P value	d	
Normal delivery	6	7850 (2143)	6416 (1020)	-1.5	0.1	0.8	2	19500 (13435)	15500 (7778)	-1.0	0.5	0.3	3	8000 (2000)	7333 (2309)	1.0	0.4	0.3	
Family Planning	6	392 (118)	525 (484)	0.7	0.4	0.3	2	750 (353)	250 (353)	-	-	1.4	3	266 (251)	433 (115)	1.0	0.4	0.8	
*ANC1	8	10142 (4589)	11500 (3399)	1.8	0.1	0.3	1	10500 (7071)	16900 (3394)	0.8	0.5	1.1	3	0	3333 (5773)	1.0	0.4	-	

*Includes associated lab test. One confessional facility reported cost; ANC1 and associate Lab test increased mean difference (13000frs CFA), but insignificant, normal delivery and C-section increased but no family planning services offered in the confessional. At Para public, ANC1 lab were mostly free but after PBF the cost increased due to additional test.

5.4 Family Planning

Generally, facilities reported a reduction in contraceptive costs across sectors. Fourteen public facilities, ten private facilities, and two confessional facilities reported such costs (Fig. 4.2). Not all facilities provided costs for each contraceptive type, and this varied according to what they normally have in stock. Jadelle was observed to be the most expensive contraceptive in private and confessional facilities compared to public facilities. Buea was the only district that provided a more detailed information on contraceptive; therefore, Fig 4.2. shows the reported mean cost before and after PBF for each reported contraceptives from health facilities in Buea district.

Figure 4.2. Contraceptive cost before and after PBF across health sectors, Buea district



Note: Only Buea district reported the cost of each contraceptive type. The other two districts did not report the cost by contraceptive type.

6. Survey Results

A total of 3854 women were attending ANC visit at the time of the study, including 1574 from Buea, 528 from Tiko, and 1752 from Limbe. Facilities in Tiko enrolled in PBF as of 2018. A total of 823 women

attending antenatal care visit and/or who had delivered at the time of the study responded to the survey and 735 respondents were included in the final analysis. (Fig. 4.1). Mean reported household income across district ranged from 30000 to 60000frs CFA. Based on survey responses, cost for iron supplements and anti-malaria pills have decreased, which corroborates with the data from the health facilities. A general increase in C-sections was observed in all districts which aligns with the results from the health facilities. Tables 4.4–4.7 present the survey results by district and sector. All costs are based on reported cost from women. Results are presented by district.

The results of paired t-tests in Limbe district indicates that the first ANC reported cost and associated laboratory test increased by 1,519frs CFA this increase aligns with the reported cost from health facilities in Limbe, but a difference in the reported mean value of 677frs CFA. The reported cost for normal delivery increased by 5,656frs CFA, and this increase was statistically significant for all sectors. By contrast, the results from health facilities indicates a decreased in normal deliveries in Limbe.

In terms of facility type, the reported increase in cost for the first ANC and associated laboratory test in Limbe district was higher in confessional facilities with a mean cost difference of 5,500frs CFA ($p < 0.01$) followed by public 2,338frs CFA ($p < 0.01$) and private 1,055frs CFA ($p < 0.05$). The reported increase in cost for normal delivery was also higher in confessional facilities at 8,277frs CFA ($p < 0.01$) followed by private facilities at 6,685frs CFA ($p < 0.01$) and public facilities at 6,460frs CFA ($p < 0.01$). An insignificant decrease was observed for echography costs at 500frs CFA in public facilities and 1,000frs CFA in private facilities in Limbe district (Tables 4.4–4.7). No confessional facility reported on family planning, and most para public facilities did not provide family planning services before PBF, but post-PBF reported a mean difference of 300frs CFA. Echography cost increased in Limbe but was not significant. The reported cost for family planning indicates a significant increase in public facilities in Limbe ($p < 0.05$).

Table 4.4. Survey results on differences in cost of indicators of maternal care, pre- and post-PBF implementation, as reported by women and by district

		Limbe					Buea					Tiko						
Variables	N	Mean difference	95% CL Mean	Std Dev	P-value	N	Mean difference	95% CL Mean	Std Dev	P-value	N	Mean difference	95% CL Mean	Std Dev	P-value			
ANC1	316	1519	1202	1835	2860	0.000	166	2641	1966	3316	4404	245	-2023	-1448	4569	0.000		
													-2598					
Normal deliveries	310	5656	5270	6042	3457	0.000	103	5383	3513	7253	9570	0.000	242	-1207	-2465	51	9939	0.060
Family planning	182	432	403	462	203	0.000	174	215	116	314	663	0.000	36	-838	-1249	-428	1212	0.0002
Echo Graphy	13	116	-1149	1380	2093	0.84	158	-1528	-2306	-750	4948	0.0002	153	-683	-1044	-322	2258	0.0003

Table 4.5. Survey results on differences in cost of indicators of maternal care, pre- and post-PBF implementation, as reported by women and by sector, Limbe district

Variables	Public Facilities						Private Facilities						Confessional					
	N	Before Mean (SD)	After Mean (SD)	T	P Value	d	N	Before Mean (SD)	After Mean (SD)	t-value	P Value	d	n	Before Mean (SD)	After Mean (SD)	t-value	P value	d
ANC1	121	15512 (804)	17850 (1960)	10.75	0.000	1.5	140	15335 (2039)	16390 (1653)	3.78	0.0002	0.5	9	14500	20000 (1581)	10.43	0.000	-
Normal deliveries	115	21,704 (1642)	28,165 (1468)	30.09	0.000	4.1	140	21414 (3006)	28100 (1114)	26.33	0.000	2.9	9	21000	29277 (3133)	7.92	0.000	-
Family planning	28	107 (478)	500 (0)	4.3	0.0002	-	108	-	500	-	-	-	-	-	--	-	-	-
Echography	8	6875 (517)	6375 (2386)	-0.57	0.58	0.2	4	6750 (288)	7750 (500)	2.8	0.06	2.4	-	-	-	-	-	-

N=316; d is the effect size from Cohen D's calculation. parapublic facility results n (46) but results could not be generated (mostly free services before given that most of the services are subsidized)

Table 4.6. Survey results on differences in cost of indicators of maternal care, pre-and post-PBF implementation, as reports by women and by sector, Buea district

and by sector, Data district																		
Public Facilities							Private Facilities					Confessional						
Variables	N	Before Mean (SD)	After Mean (SD)	T	P Value	D	N	Before Mean (SD)	After Mean (SD)	t- value	P Value	d	n	Before Mean (SD)	After Mean (SD)	t- value	P value	d
ANC1	72	13104 (3218)	14236 (3505)	2.87	0.005	0.3	53	12,452 (4064)	17254 (3788)	5.93	0.000	1.2	40	14650 (1625)	17212 (1154)	7.45	0.000	1.8
Normal deliveries	43	13290 (3922)	13000 (6454)	- 0.45	0.65	0.05	29	21310 (8190)	31000 (14240)	4.67	0.0001	0.8	30	17033 (2442)	26666 (10612)	5.59	0.000	1.2
Family planning	86	1516 (417)	1625 (626)	2.05	0.043	0.2	52	1832 (468)	2194 (707)	3.06	0.0035	0.6	35	2120 (502)	2391 (580)	2.33	0.025	0.4
Echography	54	8425 (8067)	6138 (489)	- 2.07	0.043	0.4	58	6870 (1057)	6112 (513)	-5.08	0.000	0.9	46	7956 (2190)	6347 (313)	-4.9	0.000	1.0

N=174; d is the effect size from Cohen d's calculation

Table 4.7. Survey results on differences in cost of indicators of maternal care, pre- and post-PBF implementation, as reported by women and by sector, Tiko district

Variables	N	Public Facilities					Private					Confessional					Para public		
		Before Mean (SD)	After Mean (SD)	T	P Value	n	Before Mean (SD)	After Mean (SD)	t-value	P value	n	Before Mean (SD)	After Mean (SD)	t-value	p value	n	After Mean	t-value	P value
ANC1	169	19202 (5258)	16240 (2490)	-7.5	0.000	18	16111 (1745)	16022 (730)	-0.19	0.84	17	15382 (1505)	15905 (767)	1.14	0.26	41	8526 (8043)	-0.2	0.8
Normal deliveries	166	22831 (3930)	19050 (9643)	-4.48	0.000	18	22500 (2520)	28333 (1371)	9.7	0.000	17	21970 (2901)	28117 (927)	8.9	0.000	41	15073 (14206)	5.8	0.000
Family planning	35	1622 (924)	760 (789)	-4.18	0.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Echo-graphy	120	6580 (2238)	5632 (2199)	-4.6	0.000	12	6816 (1641)	7416 (514)	1.07	0.30	9	7111 (333)	7777 (666)	2.30	0.047	12	6666 (3228)	-0.3	0.69

N=245. Mean and (SD). Cost for Para public before PBF; ANC1 8585(8172), Normal delivery 12000(11418) and Echography 7000(738)

In Buea district, the first ANC and associated laboratory test reported cost increased in all sectors with a statistically significant mean difference of 2,641frs CFA ($p < 0.01$) and normal delivery of 5,383frs CFA ($p < 0.01$). In terms of facility type, ANC1 cost increased by 1,131frs CFA ($p < 0.01$) for public facilities, 4,801frs CFA ($p < 0.01$) for private facilities, and 2,562frs CFA ($p < 0.01$) for confessional facilities. Normal delivery cost decreased in public facilities by 290frs CFA, but this was not statistically significant. However, there was a statistically significant increase in normal delivery costs in private facilities of 9,689frs CFA ($p < 0.01$) and in confessional facilities of 9,633frs CFA ($p < 0.01$). Echography costs decreased in all sectors, and the decrease was statistically significant. The mean cost for family planning increased in all sectors, and this increase was also statistically significant.

In Tiko district, the first ANC and associated laboratory test costs decreased by 2,023frs CFA ($p < 0.01$) and normal delivery by 1,207frs CFA ($p < 0.01$). Both changes were statistically significant. Family planning and echography cost also decreased and both changes were statistically significant. In terms of facility differences, the first ANC costs in public facilities decreased by 2,962frs CFA ($p < 0.01$), but the decrease in private and Para public facilities was not significant. However, there was an increased (not statistically significant) in the confessional facility cost for the first ANC. Echography cost decreased for all facility types, and this was statistically significant. Normal delivery costs decreased in public facilities by 3,780frs CFA ($p < 0.01$) but increased in confessional, private, and para public facilities by 6,147frs, 5,833frs, and 3073frs CFA, respectively ($p < 0.01$). These reported cost changes for normal delivery are consistent with the reported results from the health facilities for public and confessional facilities. However, there was decreased cost for normal deliveries in private facilities, contrasting with the from health facility results. Family planning costs decreased by 862frs CFA, and this was significant. No observations could be made for family planning in para public and confessional facilities.

6.1 Subgroup Assessments of the Poor and Vulnerable and the Non-poor and Vulnerable from Survey Respondents

In Limbe district, 76.58% of respondents were non-poor and vulnerable (NPV), and 23.42% were PAV. 18.60% of the NPV received free first ANC services versus 1.35% of the PAV. In total, 30.11% of those with primary education received free first ANC care, and 9.14% of those with secondary education (supplemental Table 4.9). The average reported monthly household income of those who received free first ANC was 44,173frs CFA, while the average income of those who did not receive free first ANC was 50,349frs CFA. 19.83% of those who had NPAV status received free or subsidized normal delivery services, while 1.35% of those who had PAV status received free normal delivery. With an average reported household monthly income of 47,081frs CFA versus 49,883 reported monthly household income for those who did not receive free normal delivery services.

In Buea district, 92.64% of those who responded to the survey were NPAV and 7.36% were PAV. None of them received free first ANC visit. However, 21.34% of the NPAV received free or subsidized normal delivery, while 78.95% of those having PAV status received free or subsidized normal delivery. In total 30.12% of those with secondary education received free normal delivery services, while 77.89% of those with university education did not receive free normal delivery. The average reported monthly household income of those who received free normal delivery was 90,000frs CFA, versus 63,527frs CFA for those who did not receive free normal delivery.

In Tiko district, 63.45% of those who responded to the survey were NPV and 36.55% were PAV. 10.13% of those who had NPAV status received free first ANC, versus 4.40% of those who had PAV status. In total, 13.95% of those with primary education received free first ANC care, while 96.09% of those with secondary education did not receive free first ANC care. The average reported monthly household income of those who received free first ANC was 49,425frs CFA, while the average income of those who did not receive free first ANC was 59,352frs CFA. 12.66% of those with NPV status received free normal delivery, while 5.49% of those who had PAV status received free normal delivery. The average reported monthly household income of those who received free normal delivery was 55,940frs CFA, versus 58,807frs CFA for those who did not receive free normal delivery.

We conducted sensitivity analysis to assess if there was any change in the mean cost for first ANC and normal delivery by removing all those who had PAV status considering that PAV status individuals are not paying the actual cost it is either provided free or at a reduced rate which is not the standard cost. There was no difference in mean ($\pm$ 300frs CFA). This is likely because some NPAV also received free or subsidized services.

6.2 Differences Between Districts and Health Sectors

Generally, there are important and significant heterogeneity in cost across sectors and districts. OOP expenses for C-sections increased across all districts. For normal delivery, a reduction was observed in Limbe and Tiko districts from the health facilities, but there was a difference between sector in Tiko with confessional facilities reporting an increased in cost while public and private facilities reported a reduction. In Buea, there was an insignificant increase in normal delivery. For the first ANC, there was an observed increased across all sectors in Limbe except for para public, while in Tiko, an increase in cost across all sectors was observed.

The survey responses also reported important and significant heterogeneity among facilities with first antenatal care costs increased in confessional and private facilities more than in public facilities in Limbe. However, in Buea, normal delivery costs increased in all sectors. In terms of facility types for Buea district, normal delivery costs decreased in public facilities, which was not significant, but a significant cost increase for normal delivery was observed in private, confessional and para public facilities. A similar pattern appeared in Tiko district: normal delivery costs decreased in public facilities (not significant) but increased significantly in private and confessional facilities.

7. Discussion

Based on costs reported from health facilities and survey, the introduction of PBF reduced OOP expenses for some services such as medication (iron supplement and anti-malaria pills) and the second to fourth visit for antenatal care across sectors and districts. However, this reduction was not observed for the first

antenatal care visit (with the inclusion of associated laboratory tests). The cost for first antenatal care and associated lab test increased across sectors (Tables 4.1 and 4.3). This increase in cost for antenatal care for all facilities and across districts was explained by health administrators in the different facilities to be related to the introduction of additional laboratory tests that had not usually been conducted before PBF during routine first ANC visit before PBF was implemented. These tests were introduced to enhance quality of care and as additional quality indicators in the PBF check list. The cost for first ANC registration (which is usually the consultation card and drugs) that has not increased -instead, the laboratory tests that have been conducted during the first ANC since PBF implementation have inflated the overall cost of the first ANC visit. After PBF, additional tests such as hepatitis B screening were included in the list of laboratory tests performed to increase quality of care. Women reported reduced cost for the second to fourth ANCs. A general reduction in the cost of echography was reported in both the secondary and survey responses, and this corroborates with the results of the impact evaluation [15].

The cost for normal delivery decreased in public sectors in Limbe district, but C-section costs did not decrease. The costs for normal deliveries increased in private and confessional facilities in Tiko but decreased in public facilities. This increased cost for normal delivery was also explained by health administrators and/or staff to be related to some of the equipment used during delivery to enhance quality for example, the use of disposable sterile garments, as well as other equipment used in the delivery ward, all were intended to enhance quality.

The delivery kit that is already subsidized by the government only covers a portion of the cost during skilled birth delivery because all those who have experienced a C-section reported a minimum cost of 60,000frs CFA and this was mostly from public facilities, other private and confessional facilities reported minimum from 100,000frs CFA. This includes provider fees for conducting the surgery and facility fees (e.g., bed fees for the number of days) and drugs. Thus, the cost for C-section is high in all health facilities especially in private and confessional. Private facilities reported that they have step down

their prices for certain services to attract more users, but this reduction was not observed in the survey responses.

The impact evaluation reported significant cost reduction for laboratory and x ray fees but did not mention if the laboratory test were those routine tests during first ANC visits or non-ANC visits [15]. Thus, cost for laboratory tests may have reduced from the impact evaluation assessment, but the quantity of the laboratory tests for the first ANC increased with the intention of enhancing quality. This increase in the quantity of test likely inflated the cost for routine first ANC and its associated laboratory test. Therefore, as PBF attempts to improve on the quality-of-care delivery, and to reduce cost by subsidizing user fees to reduce OOP expenses to stimulate demand, have an indirect impact on cost especially in a setting with an existing high OOP expense. This likely explain some of the reasons the PBF program did not impact on access to antenatal and skilled birth delivery, in addition to the existing high OOP expenses [15,22]. Moreover, any attempt by private and confessionnal facilities in reducing cost does not seem to make much difference and still reported high amongst specific group of population because of the existing high cost when compared to public facilities [16]. In Tanzania, PBF impacted on OOP expenses by reducing the probability of paying for skilled birth delivery and improved on skilled birth delivery in public facilities by 78% and reduced the cost of drugs in pharmacies [16,31,32].

One of the facilities in Limbe reported that some contraceptives are supposed to be free; we observed that women pay for these contraceptives across all facilities in the three districts. However, the staff at the health facility reported that when contraceptives are free, women are skeptical about the quality. Thus, though the impact evaluation reported an increase in the availability of family planning contraceptives and access to family planning¹⁵, this did not necessarily reduce the cost of some of the family planning contraceptives.

Facilities reported providing free drugs for those with PAV status and including especially internally displaced persons who have been displaced from their place of origin due to the ongoing conflict. Women did not report any additional fees collected as unofficial payment, and this corroborates with the findings of the impact evaluation, which reported a significant reduction in unofficial fees [15].

We did not assess how PAV are identified and the criteria for eligibility, however, based on the PAV assessment, it is likely that the criterion for identification also varies by facility type; some with an NPAV status also received free care. It is likely that the criteria used to identify who is PAV to receive free services is beyond income and/or sociodemographic characteristics. Thus, it is important to understand how PAV is defined within the PBF program to minimize any misclassification and potential reporting bias [16]. The question is what criteria are used in identifying who is poor to be eligible for free services or a reduced service and how are they implemented to ensure they provide services to those who are in need to expand coverage and improve access? This aligns with the findings suggested from a recent systematic review that the standard wealth index scale that is used in assessing equity in PBF studies may not necessarily align with the PBF definition of who is poor in various context [16]. This also corroborates with the limitations reported in a cluster randomized control trial indicating potential difference in the scale used in the PBF study versus the approach used by the PBF program in identifying eligible participants to receive free services or considered “poor” [33]. Thus, there is need for additional research to ensure proper reporting and classification [16].

Though this study was conducted in a conflict setting, as reported by the administrators, the conflict did not have any direct impact on the cost for services; rather, the conflict has increased the number of internally displaced persons who are included in the PAV category and thus may potentially receive free services. On the other hand, the conflict situation presented a difficult atmosphere for women in raising finance for their ANC visits especially in Buea district and some women reported increased cost of services in the bushes where they either delivered or attended antenatal care. Also, important to note that having a PAV status does not imply that the woman will receive a free service, however, the service may be subsidized, and it may not necessarily be services related to the first ANC, it could be drugs, or other delivery related services, but we only assessed for cost related to the first ANC and normal delivery given the significance in the reported cost differences.

8. Policy and Practice

Costs for antenatal care and skilled birth delivery is high in private and confessional facilities, and OOP expenses for antenatal care and skilled birth delivery is still an issue in Cameroon. Following the introduction of additional testing for PBF quality indicators, which has a positive impact on quality-of-care delivery but also increased cost. It likely that this may be another possible explanation on the inability to impact antenatal care and skilled birth delivery as reported in the impact evaluation [15]. The introduction of the PAV program to offset some OOP expenses for services, which is an innovative approach, is assumed to make some difference, but the implementation and identification of eligible participants is not fully understood and could not be examined in this study.

The GDP for healthcare in Cameroon has not been over 5%--this is well below the 15% of the annual budget recommended at the Abuja Conference in 2001[11,34]. In addition, the district level gets a small proportion of the healthcare budget, with most of the resources allocated for administration and infrastructure [12,15,35]. PBF program may have an influence to an extent in the decentralization and redistribution of resources, but there is need for policy to take into consideration the important role that OOP expenses plays in impeding access and utilization of antenatal care and skilled birth delivery and important differences that exist across sector. The high OOP expenses in Cameroon requires important policy intervention across health sectors towards achieving universal health coverage and improving outcomes for antenatal care and skilled birth delivery in addressing maternal mortality.

9. Research Implications

Impact evaluation generates average effects, and therefore there is potential that it may mask important heterogeneity across health sectors [17]. This study illustrates such differences and recommends the need to disaggregate data by health sector given the important role that each sector plays in the care delivery and their differences in OOP expenses. It highlights the importance of using other methodological

approaches in studying PBF variables given the limitations of randomized control trials in generalizing results. Research should examine how PBF equity is defined and implemented in various contexts.

10. Strengths and Limitations

This study focused on three districts and collected data that can be generalized for each of the districts. The study also utilized the advantage of data triangulation using data from primary and secondary sources to validate the findings and produce a more robust understanding of the situation. The paper also highlights an important observation to collect data and not rely on the PBF impact evaluation results because the policy implementation is an ongoing process, and changes are recorded continually, with readaptation of strategies. It is important to collect data that reflect the post-pilot situation [16,36].

The limitation of using a before-and-after study design in the survey is that a respondent may have had limited memory of the costs before; however, though this was mitigated with the use of multiple data sources, including exploration of health administrators' perspective on the costs, and analysis of covariance that controlled for baseline cost. It should be noted that the bias of incomplete recall could not be eliminated. Therefore, the results should be interpreted with caution. The inclusion of Tiko district, which was recently enrolled into PBF in 2018, captured a more current situation and minimize response bias as most respondents from Tiko had a fresh memory of the cost. Limitations in the survey response for Buea district limited statistical power as some of the data were poorly reported and not included in the analysis.

Though this study is based on reported cost which has some limitations, it provides a research direction and on potential heterogeneity and validates the limitations of an RCT in generating average effects [17]. It also highlights potential differences in implementation and the concerns about the limited research in understanding how the PBF equity instruments are implemented in various context [37].

Though most of the women who have given birth before PBF were interviewed from facilities that enrolled into PBF from 2018, we observed that most of the facilities that were included in the impact evaluation of 2017 were in densely populated health facilities. This may have affected the results for Buea

because it was challenging finding women from the densely populated facilities who have used services before PBF, coupled with the ongoing conflict that has increased internally displaced persons in Buea. This provides a limitation in the results for Buea, and mostly new hired who could not provide reliable cost before PBF but the survey responses indicates that women observed increase in the quantity of test conducted in the first ANC and this aligns with the results from Tiko which enrolled into PBF in 2018.

11. Conclusion

PBF reduced OOP for routine medications during antenatal care visits and echography however, the cost for associated laboratory test during the first ANC increased in some districts and health sectors because of the increase in the number of tests, a change that was intended to enhance quality. The cost of normal delivery also increased in confessionnal facilities in Tiko due to the introduction of equipment to improve quality.

Contributions: MN conceived the study and design the methodology, data collection, analysis, investigation, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. RD, RP and RG critically revised the manuscript and provided feedback. All authors reviewed and agreed on the final version of the manuscript.

Acknowledgements

Thanks to School of Epidemiology and Public Health and Mobility bursary at Ottawa University for financial support to facilitate data collection. I thank the research assistants for their great assistance in field activities and all the health administrators whose support made this research possible.

Patient and public involvement

This study involved pregnant women attending antenatal care or who have delivered at the time of data collection at a health facility.

Funding: This study received partial financial support from thesis supervisors to facilitate data collection

Competing Interest: None declared

Data Availability: Data relevant for the study is included and/or attached as supplementary material.

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Supplemental Tables

Table 4.8. Differences in cost of indicators of maternal care, pre- and post-PBF implementation, as reported by health administrators and by district

Variables	Limbe District					Buea district					Tiko district				
	N	Mean differe nce	95% CL	Mean	Std Dev	n	Mean differ ence	95% CL Mean	Std Dev		n	Mean differe nce	95% CL	Mean	Std Dev
*ANC1	34	-1005	-2660	648	4741	26	65	-44	175	272	13	-499	-1272	273	924
ANC2	34	-288	-615	38.93	937	27	200	-87	487	725	13	-476	-985	31	840
ANC3	34	-714	-1564	135	2435	27	266	45	487	558	13	-546	-999	-92	750
ANC4	34	-191	-544	161	1011	27	340	90	591	632	13	-546	-999	-92	750
Medication (iron)	34	-694	-1029	-358	962	27	-138	-307	29	425	13	-776	-1344	-209	938
Medication (Anti-malaria)	34	-250	-443	-56	553	27	18	-19	56	96	13	-115	-366	136	416
Facility fees (consultation)	34	-0.705	-1.156	-0.255	1.29	27	355	-57	768	1044	13	0.923	0.296	1.55	1.03

*Does not include lab test, only ANC registration fees.

Table 4.9. Women who reported free or subsidized ANC1 and skilled birth delivery cost versus those who paid, across districts

Limbe	N=316				Buea	N=258				Tiko	N=249			
	ANC1		SBD			ANC1		SBD			ANC1		SBD	
	Yes (%)	No (%)	Yes (%)	No (%)		Yes (%)	No (%)	Yes (%)	No (%)		Yes (%)	No (%)	Yes (%)	No (%)
PAV	1 (1.35)	73 (98.65)	1 (1.35)	73 (98.65)	-	19 (100)	15 (78.95)	4 (21.05)	4 (4.4)	87 (95.6)	5(5.49)	86 (94.51)		
NPAV	45 (18.6)	197 (81.4)	48 (19.83)	194 (80.17)	-	239 (100)	51 (21.34)	188 (78.66)	16 (10.19)	142 (89.87)	20 (12.66)	138 (87.34)		
Education														
Primary	28 (30.11)	65 (69.89)	28 (30.11)	65 (69.89)	-	33 (100)	28 (84.85)	5 (15.15)	12 (13.95)	74 (86.05)	14(16.28)	72(83.72)		
Secondary	17 (9.14)	171 (90.86)	17 (9.14)	171 (90.86)	-	83 (100)	25 (30.12)	58 (69.88)	5 (3.91)	123 (96.09)	7(5.47)	121 (94.53)		
High School	1(3.70)	26 (96.30)	4(14.81)	23(85.19)	-	23 (100)	12(52.17)	11 (47.83)	3(9.68)	28 (90.32)	4(12.90)	27(87.10)		
University	0	7(100)	0	7(100)	-	95 (100)	21 (22.11)	74 (77.89)	0	2(100)	0	2(100)		
Income (mean estimated household)	44173	50349	49883	47081	-	70814	90000	63527	49425	59352	55940	58807		

No formal education was reported in Buea (2 respondent)and Tiko (2. Respondents)

Chapter 5

Health Seeking Behavior of Women Attending Antenatal Care and Skilled Birth Delivery Across Health Sectors in a Post-Performance-Based Financing Settings in Cameroon: A Survey and Focus Group Analysis

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1. Preface

This chapter reports on the second aspect of Objective 2 of my dissertation, which aimed to examine the health-seeking behavior of women across health sectors. This chapter is a mixed-methods design, which draws from the Andersen behavioral model of health care utilization. I conceived and designed the study and conducted a survey on women attending antenatal care and skilled birth delivery with the help of research assistants. I conducted focus group discussions with a subset of the survey respondents and interviewed women who were not using health facilities and triangulates the findings. Additionally, I interviewed health care providers specifically regarding health seeking behavior in the time of COVID-19. I transcribed the interviews with the help of research assistants and performed the data analysis and interpretation. Drs Yaya and Little supervised the design and methodology and critically revised the manuscript. Drs. Pongou and Deonandan critically reviewed the manuscript and provided feedback. All authors reviewed the final draft of the manuscript.

Status of the Manuscript: To be submitted to Journal of Health Inequalities

Ethics Approval: Required and Approved

2. Abstract

Background: High maternal mortality rates (up to 536/100,000 live births) remain a concern in Cameroon, despite multiple intervention strategies targeting antenatal care (ANC) and delivery. Up to 90% of women attend at least one ANC appointment, but only about 40% have four or more ANC visits and some women who receive ANC prefer to deliver using a traditional birth attendant. Improvement in the quality of care by providers, incentivised by performance-based financing (PBF), could affect women's health-seeking behaviour over time and impact on the utilisation of services

Methods: We conducted a cross-sectional survey of 848 pregnant women attending antenatal clinics in three districts in the southwest region of Cameroon in April-August 2021. The survey and the qualitative questions were informed by the Andersen behavioural model. Descriptive analyses were conducted, together with logistic regression analysis of the association between intention to use facility for ANC and delivery and income, employment status and perceived quality of care. Follow-up focus-group discussions were conducted with a subset of the women from the survey responses who had used ANC and delivery services before and after the implementation of PBF, and there was an exploration of providers' experiences of health seeking behaviour of women attending ANC in the time of COVID-19.

Results: Responses from 735 women were included in the quantitative analysis. Cost and quality of care are important determining factor in the choice of seeking care for antenatal care and skilled birth delivery, however, quality of care (with a focus on patient-provider communication) is important in women's decision to use the same health facility for subsequent skilled birth delivery. Alternatively, for women who do not use health facility for delivery, health facility length of stay following delivery is a determining factor to use traditional birth attendants for delivery.

Conclusion: The heterogenous nature of health seeking behavior calls for specific intervention strategies tailored to specific districts. PBF has the potential to improve quality of care to stimulate behaviour change in seeking care amongst certain group of women, but the changes seen thus far have primarily affected mostly structural aspects of quality of care. Gradual changes are being seen in providers'

communication relationships with their patients, but there is still much work to be done. Strategies are needed to employ good communication strategies that ensure patient retention to ensure continuity of care.

3. Background

Health-seeking behaviour is a form of social behaviour defined as any action or inaction undertaken by an individual with the primary aim of finding an appropriate solution to a health problem or illness [1-4]. It encompasses the socially constructed health behaviours that are influenced by the social determinants of health [1-5]. An individual's health-seeking behaviour can be influenced by cost, distance, quality of care, and cultural and societal beliefs [1-4,6]. It is a dynamic process that involves the use of several modalities at one time and allows the individual to navigate the health system for treatment, diagnosis, or other health related services [1-4,6-8].

Women can be at higher risk of maternal morbidity and mortality due to health-seeking behaviours and lack of access to health care [1,9-11], while poor-quality roads and a lack of transportation systems can compound this issue. The assumption that women will seek care in the health facilities closest to where they live – or, in other words, that people living in the catchment area of a facility will obtain care from that facility – is not true in most settings [6,9-12]. Empirical studies suggest that women will bypass their local facilities to obtain better services, and the quality of care provided in the health facility plays an important role in their decisions [6,7,10,11,13]. This “shopping” behaviour can be costly for women, both financially and in terms of travel time [6-8]. Financial costs may include additional out-of-pocket (OOP) fees for services, transportation, and other incidentals [6,8].

Shopping for healthcare services is a common phenomenon in Cameroon and in most sub-Saharan African countries [6-13]. Evidence indicates that up to four antenatal care (ANC) visits (currently revised to 8 ANC visits as recommended by the World Health Organization) [14] and the use of skilled birth delivery can reduce maternal mortality [1,2,6,9]. However, some women do not attend ANC due to cost and other related factors, and access to skilled birth delivery is reported to be influenced by cost, quality, and cultural practices [1,6-11]. Studies of health-seeking behaviour suggest that this shopping decision generally reflect a search for higher quality services at affordable prices [6,8-11]. This indicates that health interventions such as performance-based financing (PBF), which aim to improve service

quality across health facilities and an equity aspect on subsidizing user fees to reduce OOP expenses to stimulate demand, may influence health-seeking behaviour as the standards of local facilities are likely to improve as a result of change in providers behaviour incentivized by PBF strategies [5,6,14-16].

In 2012, Cameroon implemented a PBF programme for improving quality of care, with a focus on maternal and child health services [12]. The PBF impact evaluation assessment in Cameroon observed that this aspect of shopping for health services by women was not influenced by PBF intervention [12], but the evaluation did not examine potential underlying factors that may influenced the shopping around attitude. The assessment reported that only 52.3% of women sought antenatal care in their assigned treatment group, and a similar pattern was reported for deliveries and postnatal care [12]. In 2017, the country extended the PBF programme to all health facilities and across all health sectors.

The heterogeneous nature of health-service delivery in Cameroon (public, private, parapublic, and confessional sectors) could potentially influence the health-seeking behaviour of women in relation to ANC and skilled birth delivery. These sectors have different organisational cultures, and the costs vary substantially by sector [17]. There are also differences in quality of care by sector. A post-PBF study in Cameroon found that women reported financial barriers to use of healthcare facilities [18].

High maternal mortality rates (up to 536/100,000 live births) remain a concern in Cameroon, despite multiple intervention strategies targeting antenatal care (ANC) and delivery [12]. Up to 90% of women attend at least one ANC appointment, but only about 40% have four or more ANC visits [19] and some women who receive ANC prefer to deliver using a traditional birth attendant. Though the PBF impact evaluation in 2017 concluded that there was no effect on these two indicators [12], improvement in the quality of care by providers, incentivised by PBF, could affect women's health-seeking behaviour over time and impact on the utilisation of services [5,14-16].

A recent study on the effect of PBF on OOP expenses for ANC and skilled birth delivery across sectors in Cameroon found that, in this attempt to improve quality of care, the cost of the first ANC increased due to additional laboratory tests and varied by sector [17]. In addition, PBF marked an innovative approach to providing free or subsidised services for “poor and vulnerable” women, which

could influence their health-seeking behaviours, as women in this group are more responsive to price changes [5,17,20]. Also, the introduction of home visits was reported to have an increase in the use of family planning in the PBF areas as compared to the control areas [21]. As maternal health-seeking behaviour is a complex phenomenon, influenced by other socio-determinants of health, coupled with the heterogenous nature of health care delivery in Cameroon, it is important to understand the contextual setting, as factors vary from one culture and setting to another. Given that all health facilities are enrolled into PBF, it is important to understand the health-seeking behaviour of women in the post-PBF setting and to design interventions based on this, as this could help increase access to and utilisation of ANC and skilled birth delivery. Intervention strategies may differ depending on the choices made at various levels when seeking care, and there is a need to prioritise intervention strategies according to identified need to improve access.

The first objective of the present study was to understand the health-seeking behaviour of women in terms of ANC and skilled birth delivery across health sectors in a post-PBF setting. In addition, in the context of the ongoing COVID-19 pandemic and the associated limitations on movement, it was understood that health care-seeking behaviour might change. This, coupled with an ongoing conflict in the study region, is creating uncertainties and impeding access to health facilities. Therefore, the second objective was to understand the health-seeking behaviours of women and the experiences of providers during the pandemic.

4. Method

4.1 Study Design and Settings

This study is a mixed method that has three components: (1) a cross-sectional survey of pregnant women attending an ANC clinic; (2) follow-up focus-group discussion (FGD) with a subset of the women from the survey who had used the services before and after the implementation of PBF; and (3) an exploration of providers' experiences of women attending ANC and skilled birth delivery in the time of COVID-19.

In Cameroon, health care is delivered in both the private and the public sector, and PBF has been implemented in all health facilities across all sectors. The private sector is comprised of private, for-profit health facilities and confessional and traditional health services. Women constitute 50% of the population of Cameroon, and their life expectancy at birth is 55 years [19,22,23]. The study was conducted in three districts in the southwest region, in which there has been armed conflict since 2017. According to information obtained during the study from the PBF regional office and the district health bureau and regional delegation, the population of the three districts is Buea (184,601), Limbe (211,186), and Tiko (161,063).

All health facilities are assigned specific equity status, based on their accessibility and level of poverty of the people in the district. This is used to determine the PBF equity bonus to be provided to the health facility as a way of subsidising care to attract clients and stimulate demand, especially among those considered poor. Equity status for health facilities is rated between 1 and 5, where 1 indicates low-level accessibility for the health facility in all seasons (rainy and dry), sparsely populated, very poor, and far from the district health facility, while 5 is very accessible, wealthy, well-populated, and closer to the district health facility (see Appendix G). This equity bonus for health facilities is intended to encourage the provision of services at an affordable rate and to stimulate demand for services, which can influence health-seeking behaviour. The data-collection period for this study was from April 2021 to August 2021.

4.2 Framework

The use of health services, as described by Andersen's behavioural model of health care utilisation, is a function of a woman's propensity to use the services, which is determined by predisposing factors including her age, marital status, occupation, and income [24]. Enabling factors are those that facilitate access and the use of services [24]. Contextual factors as defined by Andersen's model as the circumstances and the environment in which health care is accessed, and these include organisation level factors (health-sector- and provider-related) factors [24]. Individual characteristics include factors such as health belief perspectives, attitudes towards ANC and skilled birth delivery, and values concerning the

health system [24]. Enabling factors are the characteristics that can facilitate the utilisation of services – for example, financial and geographical access and distance of the home from the facilities [24].

The outcomes in this paper are women's satisfaction with the care received for ANC and skilled birth delivery which is defined in this study as the intention to use services again in the same facility for ANC and skilled birth delivery, and the factors that facilitate or hinder women's choices when seeking out ANC and skilled birth delivery to improve their quality of life.

4.3 Survey Data Collection

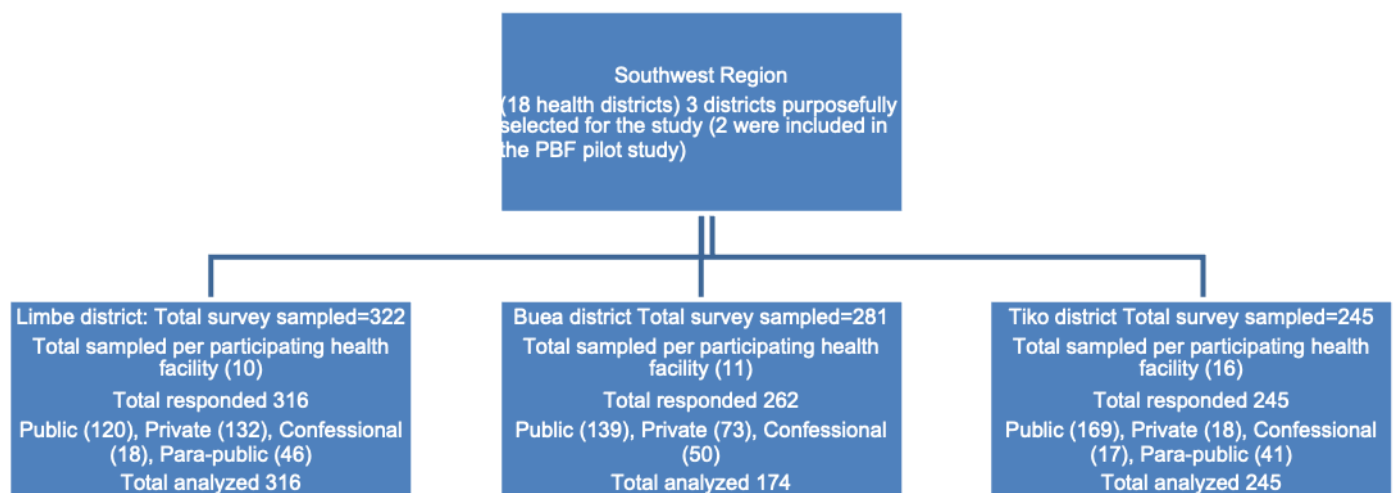
The survey comprised 33 questions. The first questions concerned the respondents' demographic characteristics (7 questions--Appendix B). These demographic characteristics were also considered predisposing characteristics in the Andersen behavioural model [24]. They were potential confounders (e.g., age, marital status, education, income level, etc.). The second part of the survey focused on health-seeking behaviour, as informed by the Andersen behavioural model (26 questions). The questions primarily concerned health-service characteristics, which were contextual and/or individual explanatory factors associated with the performance of a health facility or health system that could influence health-seeking behaviour (e.g., cost, quality of care, distance, accessibility, availability of equipment). The survey employed a 5-point Likert scale. To assess the readability, applicability, understanding, timing, and validity of the survey items, they were tested with 10 women who were attending the antenatal clinic and not selected for the study sample. Minor adjustments were made based on their feedback. The questionnaire was designed to take approximately 25 minutes to complete, and research assistants assisted in administering the surveys at the health facilities. Health administrators also assisted in identifying eligible pregnant women attending ANC or women who had delivered and were hospitalised and have used the service before 2018(or before the facility was enrolled into PBF), as well as identifying those considered poor and vulnerable. Health facility administrators keep records of women who have received services within the PAV category. All the questions were the same for both PAV and non-PAV and the survey participants did not have any knowledge of the PAV category to which they had been assigned. To ensure the quality of the findings, training was provided (by the principal investigator) to the data

collectors, who were all master's students with experience in data collection, on the procedure to collect consent, and the objective of the study. The principal investigator supervised the data collection daily to identify any incomplete and incoherent responses. Each completed survey was verified for completeness as the data were being entered into Excel. The data were then coded, cleaned, and exported to SAS for analysis.

4.4 Study Population and Sampling

The southwest region has 18 health districts. This study was conducted in 3 of the 18, namely Limbe, Buea, and Tiko. Based on the PBF registered health facility record at the time of the study, these three districts are collectively home to about 90 health facilities (Fig. 5.1). All 90 health facilities were eligible for the study, thus ensuring the generalisability of the results. A cross-section of 848 women were sampled from the population of women attending ANC at the time of the study. The assumed proportion of women attending ANC and skilled birth delivery at the time of the study was 0.50, at a 95% confidence level and a 5% margin of error. and the estimated design effect was 2 [25-27]. To account for potential nonresponse, the sample size was inflated by 10%. This ensured that the reported experiences of cost were representative of women attending antenatal clinics and engaging with skilled birth delivery at the time of the study. Given that the proportion of women attending ANC and skilled birth delivery varies per district, a sample size of 848 was allocated using proportionate allocation, based on the total number of expected deliveries for 2021 in Appendix F (see Fig. 5.1).

Figure 5.1. Sampling of health facilities and districts



4.5 Variable Selections and Definition

The outcome variables were the intention to use ANC and skilled birth delivery for subsequent pregnancy; and socio-economic and demographic-related variables, quality of care (as defined by the respondents), cost, and distance were the independent variables. The outcome variable “ANC” was defined as any ANC visit, and “skilled birth delivery” was any delivery at a health facility (public, private, parapublic, or confessional) that was attended by a skilled attendant.

4.6 Statistical Analysis of Survey Data

A descriptive statistics analysis was performed to summarize the variables, generating the percentages across sectors. A Chi-square test was conducted to identify any associations between categorical variables. Logistic regression was performed to determine associations for the outcome variables intention to use ANC and/or skilled birth delivery services at the same facility for subsequent pregnancy and associated factors. Variables selection was as follows, we first conducted unadjusted bivariate model for each covariate and selected all covariates that were moderately associated with the outcome considering the p-value less than 25% as recommended by Hosmer and Lemeshow [28]. This was included in the multivariable-bivariate model. We used sequential approach to select the model by first fitting a model with all the covariates (unemployed, quality, income, education, age, marital status) and we used a stepwise approach to eliminate non-significant covariate at 5% significance level and determined the best fitting model based on the AIC values, where a lower AIC value was a better fit. Bivariate correlation included in the analysis are shown in Tables 5.4a and 5.4b. Due to the nature of the responses for Limbe district and imbalance in the variables for Tiko district for use ANC again, we could not perform logistic regression.

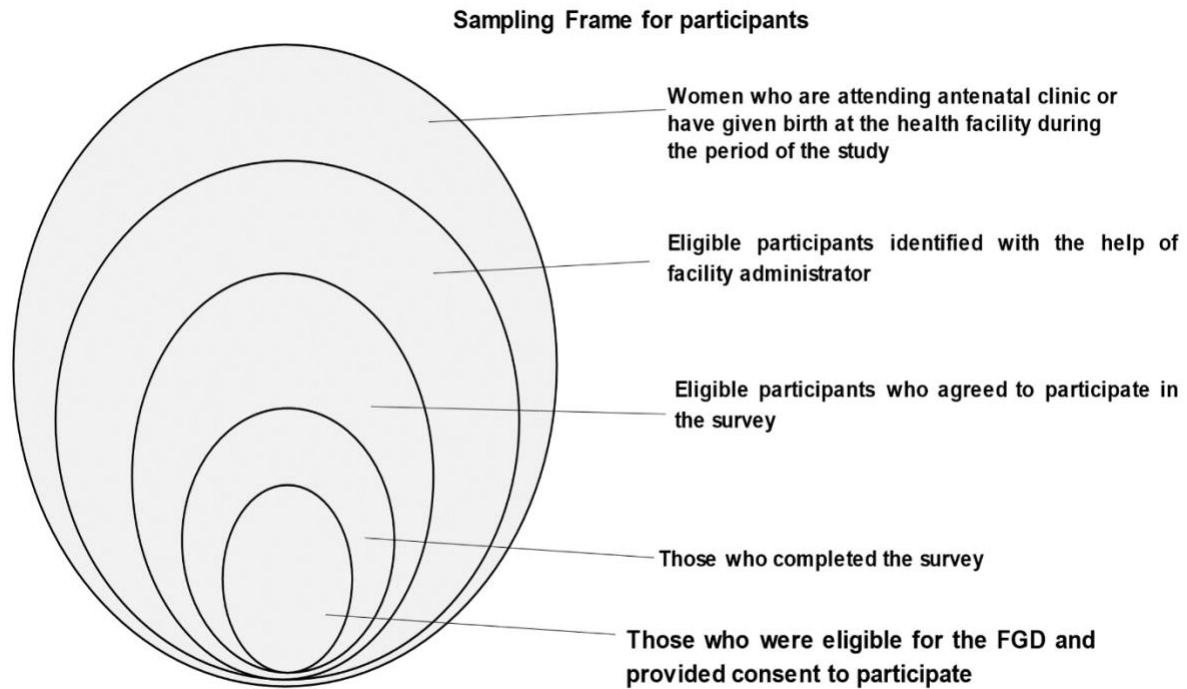
4.7 Qualitative Data Collection

Focus group discussions were conducted with women and community health workers and semi structured interviews with health care providers.

4.8 Focus Group Discussions (FGDs) with Women who had used ANC and Skilled Birth Delivery Before and After the Introduction of PBF

To supplement the quantitative data and to minimize recall and response bias, we conducted FGD with women identified during the survey process who had used ANC and skilled birth delivery before and after the introduction of PBF (Fig. 5.2 below). Theoretical sampling was used to identify the women, based on their responses to the survey in relation to themes from Andersen model for example cost, distance, quality of care provided, facility type. There were six FGDs for women, each of which included 4-10 participants. The six FGDs included two for each district, one for participants deemed “poor and vulnerable” and another for those who were not. Based on the responses from the FGDs, we then sampled women who were not currently attending ANC, with the goal of understanding the factors influencing their health-seeking behaviour to use traditional birth attendants.

Figure 5.2. Sample frame for participants



4.9 Interviews and Focus Group Discussions with Health Care Providers in the Context of COVID-19

Given that the study was conducted in the time of COVID19, we conducted interviews with health providers and a FGDs with community health workers to understand health-seeking behaviours of women for ANC and skilled birth delivery seen during the pandemic. The aim was to gather nuanced insights into the uptake of ANC and skilled birth delivery – as well as the reasons underlying these health-seeking behaviours – in the context of COVID19. A semi-structured interview guide was used in the individual and group discussions. Purposeful sampling was used to identify participants for interviews and FGD and snowballing technique was used to further identify participants for the interview. The interview questions were the same as those asked in the survey, with a focus on choice of health facility in the time of COVID-19.

The FGD was focused on community health workers. Each FGD commenced with a section encouraging the participants to talk, followed by an introduction that laid out the topic and asked the participants to think about and connect with the topic. There was then a transition, which allowed more

conversation into the key research areas of the study. This section included probing questions in relation to specific aspects of seeking care, such as the timing and priorities in the care-seeking process for ANC and skilled birth delivery in the time of COVID19. This approach was also used for the FGD with CHW and probing to understand from CHW women's priority in seeking care during ANC and skilled birth delivery. The FGDs each lasted for about 1hour. They were conducted in the local spoken language (pidgin English) and chaired by the principal investigator (MN). The discussions were audio-recorded and transcribed with the help of research assistants. Field notes and observations were documented throughout.

4.10 Qualitative Data Analysis

The interviews were transcribed (verbatim) in Word by the project investigator and a research assistant and then exported into MaxQDA [29]. A thematic analysis of the processes uncovered during the FGDs was coded using a modified grounded theory approach that employed themes from the Andersen behavioural model which are categorise as contextual or individual characteristics. The themes aligned to the domains reported in the survey. Two independent coders coded the transcripts and assessed for consistency and reliability. The results were retrieved and exported as code books for reporting. The findings are reported using the STROBE guidelines for reporting observation studies [30] and the COREQ criteria for qualitative interviews [31].

4.11 Ethics

The Bruyère Research Institute at the University of Ottawa approved the study (# M16-18-057), and administrative clearance was obtained from the Faculty of Science, University of Ottawa (#H-02-19-2829). In Cameroon, we obtained ethical approval from the University of Buea Faculty of Health Sciences (Ref 2020/1342-02/UB/SG/IRB/FHS) and administrative clearance from the regional delegation of public health in the southwest region (Ref R11 MINSANTE/SWR/RDPH/PS864/715). We obtained informed consent from all participants.

5. Results

5.1 Survey Results

5.1.1 Socio-Demographic Characteristics of the Respondents

A total of 848 women were sampled, and 823 women attending ANC visits and/or who had delivered at the time of the study responded to the survey (97% response rate). Ultimately, 735 responses were included in the final analysis (86.6%; Fig. 5.1). Most of the incomplete data removed from the analysis came from the Buea district (see Fig. 5.1). Most of the survey respondents from Tiko were self-employed and Buea had more students compared to other districts. Most responses were from public facilities – followed by private, confessional, and then para-public facilities (Table 5.1). In Limbe, 23.4% of the participants were deemed poor and vulnerable, compared with 7.4% in Buea and 36.5% in the Tiko district. However, most of the PAV were reported from public and private for-profit facilities. Confessional facilities reported less of PAV. Most women were married, and mean age group ranged from 25-34years. Most women had either primary or secondary education or no education and reported income varied with respondents from Tiko reporting more income than other districts.

Most respondents came from highly accessible facilities across all districts. In Limbe, 55% of the respondents were from health facilities considered highly accessible (with equity score of 5), and 16% were from poorly accessible facilities that were difficult to access during all seasons (equity scores of 1). This difficult to access health facilities was especially common among para public. There was a similar pattern in Tiko, however, in the Buea district, 86% of the respondents were from very accessible facilities, while none were from an inaccessible facility (see supplemental Table 5.13). Confessional and private facilities in all the districts were typically very accessible. In Limbe, 26% of the women had not had an echography in the same facility as their ANC visits, with reasons including a lack of equipment, poor-quality of the echography results, and sometimes referrals. This was similar across districts.

Table 5.1. Demographic and economic characteristics of respondents from the three districts

	Limbe district N=316					Buea N=258				Tiko N=249				
	Public n=121	Private n=140	Confessional n=9	Para public n=46	n	Public n=132	Private n=76	Confessional n=50	N	Public n=173	Para Public n=41	Private n=18	Confessional n=17	n
	n (%)	n (%)	n%	n (%)	N	n (%)	n (%)	n (%)		n (%)	n (%)	n (%)	n (%)	
Age														
18-24	35 (11)	52 (16.4)	3 (0.9)	13 (4.1)	103	43 (16.6)	18 (7)	7 (2.7)	68	50 (20)	6 (2.4)	3(1.2)	9(3.6)	68
25-34	73(23.1)	67(21.2)	5(1.6)	31(10)	176	70 (27.1)	40 (15.5)	34 (13.2)	144	92 (37)	31 (12.4)	15 (6)	3 (1.2)	141
35 and above	13(4.1)	21(6.6)	1(0.3)	2(0.6)	37	19 (7.4)	17 (6.6)	9 (3.5)	45	30 (12)	4 (1.6)	0 (0)	5 (2)	39
Education														
No Education	0(0)	0(0)	0(0)	0(0)	0	5 (2)	7(2.7)	12 (4.6)	24	2(0.8)	0 (0)	0 (0)	0 (0)	2
Primary & Secondary	99 (31.3)	132 (41.7)	5 (1.6)	46 (14.5)	281	81 (31.4)	27 (10.4)	8 (3.1)	116	145 (58.2)	38 (15.2)	16 (6.4)	15 (6)	214
High School	18 (5.7)	6(1.9)	3 (0.9)	1 (0.3)	28	10 (3.8)	4(1.5)	9 (3.5)	23	25 (10)	3(1.2)	2(0.8)	1(0.4)	31
University	4(1.2)	2(0.6)	1(0.3)	0(0)	7	36 (14)	38(14.7)	21(8.1)	95	1(0.4)	0(0)	0(0)	1(0.4)	2
Employment														
Employed	25(7.9)	58(18.3)	1 (0.3)	46(14.5)	130	55 (21.3)	57 (22)	41(16)	153	103 (41.4)	34 (13.7)	14 (5.6)	11(4.4)	162
Not working	19(6.0)	5(1.6)	2(0.6)	0(0)	26	41 (16)	12 (4.6)	9 (3.5)	62	19(7.6)	4(1.6)	3(1.2)	3(1.2)	29
Student	0 (0)	0 (0)	0 (0)	0 (0)	0	5 (2)	4(1.5)	0 (0)	9	21 (8.4)	2 (0.8)	1 (0.4)	3 (1.2)	27
Farming/self employed	77(24.4)	77(24.4)	6(1.9)	0 (0)	160	31 (12)	3(1.1)	0 (0)	34	31 (12.4)	0 (0)	0 (0)	0 (0)	31
Income														
No income	0 (0)	0 (0)	0 (0)	0 (0)	0	16 (9)	7(4)	1 (0.5)	24	0 (0)	1 (0.4)	0 (0)	0 (0)	1
<30000	3(0.9)	2(0.6)	0 (0)	0 (0)	5	20 (11.2)	12(6.7)	8 (5)	40	24 (10.2)	3(1.3)	3(1.3)	2(0.8)	32
30000-59999	86 (27.3)	124 (39.3)	7 (2.2)	45 (14.2)	262	8(3.1)	19 (10.6)	15(8.4)	42	73 (31.2)	26 (11.11)	7(3)	8(3.4)	114
60000-89999	17(5.4)	12(3.8)	1 (0.3)	1 (0.3)	31	16 (9)	11 (6.2)	7 (4)	34	45 (19.2)	6 (2.5)	5 (2.1)	3 (1.3)	59
>90000	14(4.4)	2 (0.6)	1 (0.3)	0 (0)	17	8(3.1)	19(10.6)	11(6.2)	38	23 (9.8)	2 (0.8)	1 (0.4)	2 (0.8)	28

Equity Status	17(5.4)	55(17.4)	1(0.3)	1(0.3)	74	14 (5.4)	5(2)	0 (0)	19	64 (25.7)	12 (4.8)	9 (3.6)	6 (2.4)	91
PAV														
NPV	104 (33)	85 (26.9)	8 (2.5)	45 (14.2)	242	118 (45.8)	71 (27.5)	50 (19.3)	239	109 (43.8)	29 (11.6)	9 (3.6)	11 (4.4)	158

Income for Buea only 178 responded, and Tiko 234 . Percentages are calculated using the total N for the district/total number of respondents from each sector

5.1.2 Socio-Demographic and Economic Characteristics of the Respondents and the Association with Utilization of Antenatal Care and Skilled Birth Delivery

The respondents were asked whether they intended to use the same facility for ANC during any subsequent pregnancies, and most women (91% in Buea and 99% in Tiko) said that they would – with employment, income, quality, and distance having a statistically significant influence on their decision (see Table 5.2). Those in Buea who reported that they would not use the same facility cited cost and the likelihood of displacement amidst the ongoing conflict, while in Tiko the reasons were primarily cost and distance (Table 5.2). In Buea, income, distance, and quality were associated with a decision to use the same facility for subsequent skilled birth deliveries; while in Tiko, employment, quality, income, and distance was associated with the decision. In Buea and Tiko, students, farmers, and those with no formal education were most likely to report an intention to use the same facility for future ANC and skilled birth deliveries (Table 5.2).

Table 5.2. Association between services used for ANC and skilled birth delivery and socio-demographic characteristics, Buea and Tiko districts

	Buea district n=235					Tiko district n=243						
	Use ANC facility again		X² P-value	Use facility again for SBD		X² P-value	Use ANC facility again		X² P-value	Use facility again for SBD		X² P-value
	Yes (%)	No (%)		Yes (%)	No (%)		Yes (%)	No (%)		Yes (%)	No (%)	
*Age												
18-24	52 (22.4)	8 (3.4)	0.2	52(22)	8(3.4)	0.18	66(27.1)	0(0)	0.68	58(23.8)	7(2.8)	0.24
25-34	123 (53)	9(3.9)		123(52.1)	9 (3.8)		137(56.4)	2(0.8)		129(53)	11(4.5)	
35-45	34 (14.7)	6 (2.6)		34 (14.4)	6 (2.5)		38(15.6)	0(0)		38(15.6)	0(0)	
Education	19(8)	0(0)	0.10	26 (11)	0 (0)	0.17	2(0.8)	0(0)	0.65	2(0.8)	0(0)	
No Education												
Primary & Secondary	119(50.4)	11(4.6)		108 (45.8)	18(7.6)		237(97.5)	2(0.8)		221(90.9)	18(7.4)	
University	78(33)	8(3.4)		80(33.9)	5(2.1)		0(0.8)	2(0.8)		2(0.8)	0(0)	
Employment	134 (56.7)	7 (3)	0.002	124(52.5)	15(6.3)	0.09	158(65)	2(0.8)	0.006	143(58.8)	18(7.4)	0.018
Employed												
Not working	23 (9.7)	9 (3.8)		64(27.1)	4 (1.7)		29(12)	0(0.8)		28(11.5)	0(0)	
Student	7 (2.9)	0 (0)		8 (3.4)	0 (0)		27(11.1)	0(0.8)		27(11.1)	0(0)	
Farming	52 (22)	4 (1.7)		52 (22)	4(1.7)		27(11.1)	0(0.8)		27(11.1)	0(0)	
Income (Household)	18 (11.11)	3 (1.8)	0.004	18 (7.6)	3 (1.3)	0.01	-	-		-	-	0.000
No income												
<30000	25 (15.4)	11 (6.8)		25(10.6)	11(4.6)		32(14.2)	0(0)	0.46	32(14.2)	1 (0.4)	
30000-59999	34 (21)	5 (3.1)		34(14.4)	5(2.1)		110(48.9)	1(0.4)		106(47.1)	6 (2.6)	
60000-89999	34(21)	0 (0)		32(13.5)	1(0.4)		58(25.8)	0(0)		57(25.3)	1 (0.4)	
>90000	26(16)	6 (3.7)		30(12.7)	2(0.8)		23(10.2)	1(0.4)		15(6.6)	10(4.4)	
*Quality(n=224)	205(91.5)	19(8.5)	0.001	22(9.9)	200(90.1)	0.000	241(99.2)	2(0.8)	0.000	225(92.5)	18(7.5)	0.000
*Distance (n=223)	210 (93.7)	13(5.8)	0.016	197(90.8)	20(9.2)	0.011				223(92.2)	19(7.8)	0.002

²Fisher's exact test; Pearson's Chi-squared test *In Buea, n for quality 224, distance 223, age 232, and income 162. In Tiko, income (n)=22
SBD-skilled birth delivery; ANC-antenatal care

When asked why they would choose to use the same facility again for future deliveries, the survey respondents from Buea cited the opportunity to pay in instalments, quality of care (which they defined as good nurses in relation to their communication pattern, the cleanliness of the hospital, the friendly and experienced midwives, proper patient care, and the presence of a specialist). Those who said that they would not use the facility again for skilled birth deliveries reported rudeness and insults from the nurses, the distance from their homes, staff negligence, and increases in cost. In Tiko, most women who intended to use the facility again for delivery cited affordability, noting that it was now cheaper than it had been previously, with others mentioning distance and quality. In Limbe, all the women reported that they would use service again for ANC but not for skilled birth deliveries. Therefore, a Chi-square test was not conducted for this district. However, respondents in Limbe who reported that they will not use the service again for delivery, explained that “[The] nurses were just adding prices; [they were] negligent and didn’t follow-up properly. [There was a] long wait time, [it is] too expensive, and [there are] very rude nurses”. Neither marital status nor religion had any association with the decision to use a specific facility for ANC or skilled birth delivery.

Table 5.3. Determining factors for choice of health facility for ANC and skilled birth delivery, across sectors

	Limbe district N=316				Buea district N=237			Tiko district N=243			
Choice of health facility to use for ANC again	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)	n/ (%)
	Quality	Distance	Cost	No choice	Quality	Distance	Cost	Quality	distance	cost	No choice
Public	121(38.3)	0(0)	0(0)	0 (0)	26(11)	64(27)	35(14.8)	47(19)	78(31.6)	56(22.7)	0 (0)
Private	140 (44.3)	0 (0)	0 (0)	0 (0)	38(16.1)	27(11.4)	0 (0)	13(5.3)	4 (1.6)	1 (0.4)	0 (0)
Confessional	9 (2.8)	0 (0)	0 (0)	0 (0)	33(14)	9 (3.8)	4 (1.7)	12(4.8)	5(2)	0 (0)	0 (0)
Para public	1 (0.3)	22 (7)	0 (0)	23(7.3)	-	-	-	17(6.9)	5 (2)	0 (0)	19(7.7)
Choice for facility to use delivery again	n= 316				n=239			n=248			
Public	110(34.8)	11(3.5)	0 (0)	0 (0)	18(7.5)	82(34.3)	22 (9.2)	70(28.2)	71(28.6)	19(7.6)	
Private	130 (41.1)	10 (3.2)	0 (0)	0 (0)	24(10)	40 (1.7)	3 (1.2)	12(4.8)	6 (2.4)	0 (0)	
Confessional	7 (2.2)	2 (0.6)	0 (0)	0 (0)	30 (12.5)	14 (5.8)	2 (0.8)	10 (4)	7 (2.8)	0 (0)	
Para public	1 (0.3)	0 (0)	45(14.2)	0 (0)	-	-	-	14 (5.6)	8 (3.2)	0(0)	19(7.6)

5.1.3 Reasons for Choice of Health Facility for ANC and Skilled Birth Delivery

The respondents were asked to provide the reasons for their choice of health facility. In the Limbe district, quality of care was the main reason, cited by 85.7% of respondents, of whom 38.3% came from public facilities, 44.3% from private, and 2.8% from confessional. However, for those attending para-public facilities, distance was the main reason given for their choice. Participants from parapublic reported that they had no choice, as the facility was provided for them (as staff of the Cameroon Development Cooperation). In addition, the facility was closer to their houses. However, in Buea, 42.2% cited distance, 30.9% quality of care, and 16.5% cost. In Tiko, 37.2% reported distance, 36% quality, and 23% cost (see Table 5.3).

Among those who would use the same facility for skilled birth delivery in Limbe, quality of care (78.4%) was the most common reason, followed by distance (7.3%). In Buea, quality of care (42.6%) was the main reason, followed by distance (41.8%); and in Tiko, quality was reported as the main reason (42.6%), followed by distance (37%).

The women were also asked if they were happy with the ANC and skilled birth delivery services being provided to them at the time of the study. In Buea, of the 229 respondents, 95 (41.5%) said they were happy with the public facilities, and 18 (7.8%) said that they were not. From the private facilities, 55 (24%) said that they were happy and 13 (5.7%) said that they were not. Regarding confessional facilities, 40 (17.5%) said that they were happy and 8 (3.5%) said that they were not. For the delivery services in Buea, 237 women responded, with 216 (91%) saying they were happy and 21 (9%) saying they were not – of whom 9 (3.8%) were using public facilities. Those who said they were not happy reported that the facilities were too costly. In the Tiko district, there were 248 responses for both ANC and delivery. In both cases, 232 (93.6%) of the women were happy with the services and 16 (6.4%) were unhappy.

When asked if they would like to use the same facility for skilled birth delivery, of the 233 in Buea who responded, 213 said yes (91.4%) and 20 (8.6%) said no. Of those who said no, 13 (5.6%) were from public facilities and gave reasons ranging from rudeness from the nurses, the distance of the facility from home, unwelcoming staff, negligence, and increases in cost. Those who said yes cited the good staff

and midwives, friendliness, and caring nurses. Regarding ANC in Buea, there were 236 responses: 216 (91.5%) said they would be happy to use the same facility, and 20 (8.5%) said that they would not. The latter cited the absence of a specialist at the health facility, cost, long waiting times, poor follow-up, distance from the homes, and rudeness of nurses.

Logistic regression was performed to assess factors associated with the intention to use same health facility for ANC for subsequent pregnancy, and assessed the effect of income, education, marital status, age, and quality of care on the likelihood that a respondent would choose to use the same services again. Quality of care was grouped into poor versus good and those who reported poor quality of care in Buea are less likely to use the same facility for subsequent ANC (OR= 0.015 95% CI: 0.001-0.153) and those who have primary education are less likely to use the same facility for delivery again (OR= 0.21 95% CI: 0.068-0.671) compared to secondary education (Tables 5.5 and 5.6). The unadjusted bivariate analysis model (Tables 5.4a&b) indicate that those who ranked quality of care as poor are less likely to use the services again for antenatal care and skilled birth delivery. After adjusting for covariates, quality of care was no longer statistically significant; this likely reflects limited statistical power.

Table 5.4a. Results of bivariate analysis of association between intended use of facility for ANC and delivery and individual-level factors, Buea district

Use facility for ANC					Use facility for delivery			
	OR	95% CI Lower	Upper	P value	OR	95% CI Lower	Upper	P value
Income >60000 vs <60000	1.133	0.417	3.078	0.806	3.356	0.960	11.726	0.057
Unemployed Vs employed	0.325	0.128	0.824	0.0179	1.341	0.476	3.780	0.5790
Quality of care Poor vs good	0.014	0.001	0.126	0.0001	0.001	0.001	>999	0.9768
Education High school vs Secondary	0.365	0.093	1.435	0.1489	0.621	0.129	2.995	0.5531
Primary vs Secondary	0.300	0.103	0.877	0.0277	0.399	0.143	1.119	0.0808
Marital status Unmarried vs married	0.877	0.322	2.389	0.797	0.525	0.215	1.283	0.157
Age <36 vs >36	2.121	0.473	9.503	0.326	0.550	0.202	1.497	0.2423

Table 5.4b. Results of bivariate analysis of association between intended use of facility for ANC and delivery and individual-level factors, Tiko district

Use facility for delivery				
	OR	95% CI Lower	Upper	P value
Income >60000 vs <60000	0.334	0.124	0.900	0.0301
Unemployed vs employed	>999	<0.001	>999	0.9401
Quality of care Poor vs good	0.001	0.001	>.999	0.9879
Education high school vs secondary	>999	<0.001	>999	0.9624
Primary versus secondary	>999	<0.001	>999	0.9373
Marital status unmarried	4.857	1.090	21.64	0.0382
Age <36 vs >36	<0.001	<0.001	>999	0.9606

Table 5.5. Logistic regression, Buea district

Use facility for ANC					Use facility for delivery			
	OR	95% CI Lower	Upper	P value	OR	95% CI Lower	Upper	P value
Income >60000 vs <60000	-	-	-	-	0.786	0.267	2.318	0.66
Unemployed Vs employed	0.417	0.136	1.276	0.125	-	-	-	-
Quality of care Poor vs good	0.015	0.001	0.153	0.0004	-	-	-	-
Education High school vs Secondary	0.280	0.067	1.166	0.080	0.279	0.067	1.166	0.080
Primary vs Secondary	0.623	0.151	2.579	0.514	0.214	0.068	0.671	0.008
Marital status Unmarried vs married	-	-	-	--	0.781	0.272	2.241	0.64
Age <36 vs >36	-	--	-	-	3.629	0.745	17.67	0.110

Table 5.6. Logistic regression, Tiko district

Use facility for delivery				
	OR	95% CI Lower	Upper	P value
Income >60000 vs <60000	0.439	0.156	1.237	0.119
Marital status	2.830	0.592	13.54	0.192

5.2 Qualitative Study Results

Six FGDs were conducted with women: two for each district, one for PAV women and another for NPAV women and 3 with CHW, one per district. We identified six women who had not used the health facility for skilled birth delivery and who preferred to use the traditional birth attendants. However, four of these women refused consent for an interview or FGD. Therefore, we interviewed the two who provided consent, as the numbers were not sufficient for an FGD. Each FGD ranged from 4-10 participants) (see Tables 5.7-5.12). Nine providers were interviewed across the three districts (3 midwives, 4 nurses and 2 doctors). Some of the CHW were not contracted by health facilities under the PBF program, therefore they are not earning regular compensation. The following paragraphs explain the discussion in relation to the contextual, individual, and cultural characteristics and implications of COVID-19.

Table 5.7. Demographic characteristics of respondents, women's focus group, Buea district

Participants	Age	Level of education	Marital status	Household monthly Income	Employment status	Equity status
Code A	26	Primary	Single	<30000	Not working	PAV
Code B	29	Primary	Married	<30000	Not working	PAV
Code C	35	Secondary	Married	-	Housewife	PAV
Code D	35	Secondary	Married	-	Housewife	PAV
Code E	31	Secondary	Married	<30000	Not working	PAV
Code F	39	Primary	Married	<30000	Not working	PAV
Code G	38	Secondary	Married	-	Employed	NPAV
Code H	27	Secondary	Married	60001-900000	Employed	NPAV
Code I	26	University	Married	60001-900000	Employed	NPAV
Code J	28	University	Married	60001-900000	Employed	NPAV
Code K	33	University	Married	120000-150000	Housewife	NPAV

Note: Four PAV reported they are farmers but currently are IDPs and not working and reported an estimated household monthly income of 30000-60000 before their IDP status. Estimated household monthly income is in frs CFA

Table 5.8. Demographic characteristics of respondents, women's focus group, Tiko district

Participants code	Age	Level of education	Marital status	Household monthly income	Employment status	Equity status
Code A	33	Primary	Married	-	Not working	PAV
Code B	29	Primary	Married	<30000		PAV
Code C	26	Secondary	Single	<30000	Not working	PAV
Code D	28	Secondary	Married	-	Not working	PAV
Code E	21	Secondary	Single	<30000	Not working	NPAV
Code F	33	High School	Married	30000-60000	Not working	NPAV
Code G	26	Secondary	Divorced	120000-150000	Self employed	NPAV
Code H	26	High School	Married	120000-150000	Employed	NPAV

Table 5.9. Demographic characteristics of respondents, women's focus group, Limbe district

Participants code	Age	Level of education	Marital status	Household monthly income	Employment status	Equity status
Code A	38	Primary	Married	<30000	Not working	PAV
Code B	37	Primary	Divorced	<30000	Not working	PAV
Code C	41	No education	Widowed	<30000		PAV
Code D	36	Secondary	Single	<30000		PAV
Code E	36	Secondary	Single	<30000	Not working	NPAV
Code F	38	Primary	Married	30000-60000	Self employed	NPAV
Code G	41	Secondary	Married	-		NPAV
Code H	39	Primary	Married	-		NPAV

Table 5.10. Demographic characteristics of respondents, CHW focus group, Buea district

Participants	Age	Education	Employment
CHW1 Male	39	N/A	Employed
CHW2 Male	28	N/A	Employed
CHW3 Woman	38	N/A	Not working
CHW4 Woman	39	N/A	Employed
CHW5 Woman	27	N/A	Not working
CHW6 Woman	34	N/A	Employed
CHW7 Woman	32	N/A	Not working

Table 5.11. Demographic characteristics of respondents, CHW focus group, Tiko district

Participants	Age	Education	Employment
CHW1Male	33	University	Employed
CHW2Male	41	High School	Employed
CHW3 Woman	42	High School	Farming
CHW4 Woman	43	Primary	Employed
CHW5 Woman	39	Secondary	Employed
CHW6 Woman	33	Secondary	Not working
CHW7 Woman	29	Secondary	Employed
CHW8 Woman	40	Secondary	Not working
CHW9 Woman	26	University	Student
CHW10 Woman	28	Primary	Not working

Table 5.12. Demographic characteristics of respondents, CHW focus group, Limbe district

Participants	Age	Education	Marital status	Employment
CHW1 Male	28	Secondary	Married	Employed
CHW2 Male	43	Secondary	Single	Self employed
CHW3 Male	49	Primary	Married	Employed
CHW4 Woman	28	Secondary	Married	Not working
CHW5 Woman	38	Secondary	Single	Employed
CHW6 Woman	42	Secondary	Single	Farming
CHW7 Woman	47	Secondary	Single	Farming

5.3 Contextual Characteristics

5.3.1 Quality of Care

The attitudes of healthcare providers during ANC and skilled birth delivery can influence the health-seeking behaviour of women and create a desire to continue shopping around, looking for quality of care at an affordable rate. Some women reported that their privacy is not respected by health providers, this was reported in the FGD by women and CHW. Health care providers do not keep patient record confidential; this therefore encourages women to seek care for ANC at a health facility further away from their health area and this practice was reported across all sectors in Tiko.

Some women prefer to use the public health facilities for all their ANC and skilled birth delivery because these facilities have skilled professionals, with a specialist present in case of emergency during

delivery or if there is a need for further assessment. However, others said that they would prefer to go to private facilities, despite the cost, because of the rudeness of some nurses in the public facilities.

concerning the hospital, I love it because there is a lot of care and moreover, I take into consideration a situation where I have to go for CS and since it is a public hospital, I am encouraged by them because they have doctors (FGD,Public, Tiko) PAV

“Public hospitals are less expensive, so we go there but private facilities have more quality care, because in public hospitals, I had a bad experience and I never returned. When I even gave birth, there was no bed, they said I had to hold the child” (FGD Buea &Limbe Private, PAV).

“Yes, like the other experiences I had, when I went there, they wrote me a drug and the nurse writing didn’t care to ask me if I still have the drug, she just gave me and because of fear I couldn’t ask, only for me to find out that I still had the drug at home” (Public NPAV, FGD Buea).

“Well, I can register for ANC in three different hospitals, it depends on the care given to me and my baby, and some nurses don’t respect our privacy” NPAV (FGD Tiko)

“The thing is that the public should increase their level of sanitation to that of the private” Buea NPAV

Well, I have observed women attending ANC further from their homes and I asked them why they don’t want to come the facility near their house, and they told me that the nurses are exposing their medical records to others (FGD CHW, Tiko)

The women perceived that there had been changes in quality of care across all districts after the introduction of PBF. Some women reported that the quality of their care in public facilities had improved, but they said that not all the healthcare workers in the facilities had improved in their attitudes. Some healthcare workers were still not working on their attitude towards women, and it varied by individuals. However, one participant talked about her experience with a confessional facility and described how rude the nurses had been to her during her last pregnancy. As a result, she had decided to go to a private facility for her current pregnancy and would prefer a private or confessional facility over a public facility, as staff at the former were negligent and did not take proper care of their patients.

There was an interesting heterogeneity in the responses, as other women expressed that they would always use public facilities because they had qualified staff, others said they would opt for the confessional facility because they provided the opportunity to pay in instalments.

“When I gave birth to my first child, there in 2012(confessional), I was well taken care of but during the three days, the services was poor care and it was more expensive, the second pregnancy, it was not expected of me to go through operation, but I did. The nurse incharge of me, refused me care because I vomited without telling her and she said I was dirty. So that is how I left confessional and came to Private hospital” (PAV) Buea.

“At confessional, proper care is given to you first, then your bills are paid later, but in public facilities, you must pay first and at times you are sent to get your own drugs even when you are sick”. PAV(Buea)

“Well, I have not really had bad experiences in public facilities, they have qualified staff, and you are normally advised to come along with someone, so the person does all the buying of the drugs”. PAV (Buea/Tiko)

5.3.2 Individual Characteristics

Some women said that they had challenges in attending ANC in a timely manner due to cost. However, their OOP expenses for normal delivery following the implementation of PBF were moderate. The women who reported that the cost was high acknowledged that this was because it was the private sector, but they suggested that the cost should be reduced even if it is a private facility. Some women had borrowed money to attend their regular ANC or skilled birth delivery. Some suggested that, as they believed that confessional and private facilities are extorting money from them, if the cost of ANC were made universal or subsidised and transparent, this would change the way they used the health services and reduce their ‘shopping around’. The women reported quality of care as the primary determinant – even ahead of cost – in their choice of facility in which to deliver their baby.

“if they can have a unique ANC card and cost it will be good for when I left BUEA health care center and went to another, I had to open another ANC card so the cost can be reduced” (Buea & Limbe)

“Price should be reduced not only for internally displaced persons but at least everyone both in private and public facilities” NPAV Buea

*“For the ANC lab tests there is really not much difference, the thing is that in some public hospitals they do not really give those cumbersome tests like in the private”*Limbe

Given that some women thought that health facilities are extorting money from them for the first ANC due to the numerous test that is required, which they expressed an observed increased in the number of tests compared before PBF. Some women argued that the numerous tests provided for first ANC visits are necessary because they helped to identify issues much earlier and provide better care. The women gave the example of sickle cell anemia, as without those extra tests being done much earlier, it is not possible to know if one’s child is a carrier. Another woman reported that if it is your first pregnancy you will need to go through all the test, and it also depends on the specific health facility attended.

“For me the prices have gone up because the first ANC (before PBF) I paid eighteen thousand something and something francs, but with this current pregnancy, I paid twenty-three thousand and something francs. I cannot forget because the first thing in mind was, I was like, why is the eighteen thousand so expensive.? But this is even more expensive (after PBF) (NPAV)

for me it has changed, it has gone a little bit down, with my first child I spent about twenty-eight thousand something (before PBF), but this one I spent almost nineteen to eighteen thousand (after PBF). (PAV, Buea)

Another point made was about the government’s subsidisation of the delivery kit. The women questioned why, despite this subsidy, they were still expected to pay over 50,000frs CFA for a caesarean section instead of approximately 40000frs including the delivery kit of 6000frs. Some argued that the government should cover the total cost of any caesarean section, especially for complex cases and for poor women.

We know that the government has subsidized the delivery kit and its 6000frs, but they charge us delivery more than that they will charge you from hundred thousand frs,it is expensive and not really easy because before I even raised the two hundred thousand for delivery for the first time (before PBF) I and my husband entered into debts which we had to pay after the pregnancy and everything (PAV, TiKo)

5.3.3 Cultural Factors

The discussion during the FGD revealed a need to explore the health-seeking behaviour of women not using health facility for delivery. It was also observed that some women who did attend ANC did not

deliver at a health facility. This group preferred to use traditional birth attendants during delivery – rather than a skilled birth attendant – but they attended ANC to ensure their babies were safe and to control for any complications.

“We do not go to the health facilities to deliver because when you go to the health facilities to deliver, they will keep you there for days and the time to take the child to the water will pass while you are still in the health facility. We go for ANC clinics to check if the baby is fine but when it is time to deliver, we do not go to the health facilities we use our women in the quarters” (Tiko).

In interviews with the two women who provided consent, we probed to understand the reasons for their choices. They explained that they needed to attend the clinic to ensure that their babies were well-positioned and healthy. One woman said that if she were feeling unwell, she would go to the hospital, but she would not use a facility for delivery because of the need to respect tradition. Specifically, when a child is delivered, they must be taken immediately to the water to allow them to become familiar with it.

We further explored whether the women would be interested in attending the health clinic with their babies for vaccinations and check-ups after the baby had been taken to the water.

“yes we can go to the hospital after the baby has been introduced to the water because this is tradition, the child needs to understand the water to know how to get to fetch fish when they grow up so we cannot deliver in the hospital not because we do not want to deliver in the hospital but because they will keep us in the hospital for several days and the time to go to the water with the child will pass while you are still in the hospital” (Tiko)

“We cannot change this tradition because we met the tradition, and it will be difficult because we need the child to get familiar with water and you can even get a divorce from your husband if you try to go against this tradition. we need to go to the water within the first three days and this is when the hospital keeps you so we cannot go to the hospital the child needs to know water to fend for his family when the child grows up and this has nothing to do with the sex of the child, but it is the tradition” (Tiko)

It was reported by the PBF verification team in the Limbe district that, following the introduction of PBF, they equally observed that some women would attend for ANC, but they preferred to deliver with a TBA in their neighbourhoods. This prompted the PBF team to introduce a mechanism to encourage TBAs to refer women to the health facilities and to encourage health facilities to partner with the TBAs. This experience was not reported in the Buea health district.

5.3.4 The Impact of COVID-19 on Health-Seeking Behaviours of Women Seeking ANC and Skilled Birth Delivery at the Institutional Level

At the individual level, women reported that the onset of COVID-19 and the uncertainty had left them frightened about attending their routine ANC, with some women anxious about using public transportation. In addition, some of the measures put in place were challenging and costly. However, the women ultimately had no choice but to attend their ANC. It should be noted that this study was conducted during a calmer period of the pandemic, when the vaccine was available from the health facilities. Therefore, the women attending ANC at the time of the study were relatively more comfortable and better informed. However, from the perspective of the health providers, there was still much work to be done, and some complained that they had to engage in psychosocial counselling when dealing with patients. Some health providers also said that COVID-19 had negatively affected their home visits. The providers also reported that uptake of ANC had fallen considerably since the onset of COVID-19.

“Covid has come teach us more of hygiene. It affected us because before the treatment centre was in the middle of the health facility. Everybody coming here had the notion that if they go to the health facility with a bit of cold, they would be declared covid positive and quarantined. Even the pregnant women were running away because when you look at the proximity of the isolation ward to the maternity, it was a problem. But our numbers really dropped, from March to June 2020 when it was at the peak, I couldn’t boast of up to 90 deliveries, it was tough”. (Midwife, Buea & Tiko)

“Covid has mostly impacted our outreaches like those who go out for home visits, have their challenges. At first people were very happy to receive nurses but now with covid they are not welcoming. It is like you are bringing the covid, the worst one doesn’t even mention vaccine. They don’t want to hear about the covid vaccine” (CHW & Nurse, Buea, Tiko)

“Concerning the utilisation of health facilities, most patients have a preconceived idea and conclude that if they come to the hospital, they are going to be declared covid positive. At some point, the number of patients visiting our health facility reduced and we had to do some sensitisation. It is still timid but much better. Utilisation rate has reduced but I don’t have the rate. We have had to deal with patient psychology more than before, counselling, psychotherapy more than you would do just to get the patient stable and accept the care you have to offer to them”. (Doctor ,Limbe)

We further probed to understand the women’s rationale for not accepting the vaccines. Some women (and wider communities) believed that there was a hidden agenda behind the provision of the vaccine. This,

coupled with the socio-political atmosphere that has increased mistrust, meant that they were not interested in being vaccinated, but their perception about the virus has change and they are able to attend ANC, but they do not want to hear about the vaccine.

“The reason for denial of vaccine is fear because of social media, most of these things is coming from social media. People say when you take it in about five years you will die, they believe that there is an agenda behind the vaccine. The agenda is to kill so they don’t want to hear about it. They say they also want to reduce the population” (Nurse, Buea)

5.3.5 The Role of Socio-Political Factors in Health Seeking Behaviour

The current socio-political situation in the country has meant fewer patients. At one time, people were leaving Buea for Douala and other regions. However, the situation has now changed, and most have returned to Buea. This was reported in the FGD in Buea. In addition, some women highlighted the challenges of obtaining ANC and skilled birth delivery in the jungle in which they were hiding. The ability to seek care in their preferred facilities was hindered by the ongoing conflict, which had led to an increase in the cost of ANC.

“I gave birth in 2011(before PBF) and the medicines and everything were not expensive I spent about eleven thousand francs and for the baby things at the health facility it was about nine thousand but now, with this crisis, I spent close to thirty something thousand for this pregnancy and we had insecurity and an unclean environment during the pregnancy and the used traditional methods as it was in the bushes that I gave birth, and nurses just placed things on the ground. You go for your clinic and the call huge amounts of money, but you do not even see what they are doing. Medicines that you buy outside will be five thousand and, in the bush, you could pay for the same medicine for fifteen thousand” PAV Buea

6. Discussion

This study found that, for women attending ANC and skilled birth delivery at a health facility, the cost and quality of care is more likely to be a factor in shopping around across districts and sectors, but quality of care provided during delivery is an important determining factor in the decision to use the same facility for skilled birth delivery (followed by distance) as reported during FGD and also observed in their choice for health facility. However, in Tiko, the pattern was different for ANC, though cost was reported as a factor, privacy of patient record was reported in the FGD to influence their search for better quality

further from the health facilities closer to them and sometimes the privacy of the ANC environment is not confined (see figure 5.3). Distance may be a determining factor for delivery because women would prefer to deliver closer to their homes, as this allows family members to bring in food and other items, which is more cost-effective. However, women who were not attending ANC or using the health facility for delivery did not report cost or distance as their concern from the interview; rather, they said that the number of days that they would spend in the health facility after delivery would prevent them from performing some of their traditional rites. These women attended ANC but preferred a TBA during delivery.

This situation of using TBAs during delivery was only reported in Limbe and Tiko from a specific group of population, which is unsurprising because these two districts are close to the sea and fishing is a common activity for much of the population that migrated from the neighbouring tribes in Nigeria and settled in these districts.

The limited echography equipment and the quality of the output was also found to influence the women's health-seeking behaviour in relation to ANC. For example, one woman expressed frustration with having been asked to attend an additional echography at 'Facility A', where the service was very expensive. As a result of the cost, she became frustrated and left the health facility and went home. However, her pain later became severe, and she decided that she needed the test. Shopping around, she found a much cheaper price at a different facility. She had the echography at the second facility and took the result back to Facility A.

One reason that many women prefer to use the confessional facilities – even when they cannot afford them – is payment considerations. Women are sometimes required to pay an instalment or stay in a facility until they are able to pay their bills, being assigned tasks to complete as payment to cover their bills.

The participants' responses revealed a lack of trust in the system in terms of pricing of ANC and skilled birth delivery. The participants felt that the system or health facility could be exploiting them.

Although PBF has helped to reduce the cost of some related ANC services, such as drugs and echography, the cost for the first ANC and skilled birth delivery (caesarean section) has increased due to an increase in the number of tests [17]. It is possible that these factors may not have been considered when initiating the PBF quality indicators to have an effect on cost [17]. The delivery kit subsidised by the government does not seem to be effective, as those who have caesarean sections will ultimately spend at least 50,000frsCFA. It should be noted that some of the women who participated in this study did not deliver in the same health facilities in which they had received their ANC. Some women cited quality concerns as the reason for this, while others had received referrals due to the nature of their pregnancies, and others cited cost as the reason. Therefore, quality of care and cost should be carefully examined, as subsidising skilled birth delivery without proper examination of the quality of care is unlikely to improve their health seeking behavior.

Previous studies have reported that many women preferred TBAs because of the distance and location of health facilities and the ways they interact with and care for them [32,33]. In Northern Ghana, despite provision of free health services for ANC and skilled birth delivery, due to quality concerns, some women still prefer to visit TBAs during delivery [32]. In Tanzania, one of the push factors for the use of TBAs was distance [33]. However, our findings in this study differ, as the length of stay in the health facility following delivery seems to be the most important factor for those women using TBAs, rather than distance or the attitude of the health providers.

Most women highlighted the need to educate providers, especially those in public settings, about the importance of communication during skilled birth delivery, as some had not changed. However, the women reported that there had been some quality improvements among providers, which corroborates the findings of a post PBF study in Cameroon that women reported positive changes in family planning and vaccination [18].

Most of the quality expectations of the participants centred around communication strategies during skilled birth delivery. These communication strategies are a minimum quality standard that do not

require technical knowhow. However, poor women are seeking skilled birth delivery at expensive health facilities, despite their limited finances, due to the quality of care they can expect to receive there. This exposes women to financial burdens, obliging them to borrow money or stay in the health facilities to compensate for the cost of the services. Meanwhile, the services in public settings are more affordable, but the poor communication strategies there alienate the women who need them and increases their financial burden by forcing them to seek quality care in expensive facilities. Quality of care during skilled birth delivery – specifically in relation to communication approaches – determines whether a woman will use the same facility for subsequent deliveries. It should be noted that this issue of poor communication reported by the women is more common among female nurses in the public health facilities.

7. Policy Implications

The utilisation and uptake of ANC and skilled birth delivery services has been very low among those who would most benefit from them [1,2,5,12]. This is especially true for services such as family planning, antenatal care and skilled birth delivery in Cameroon [12]. Subsidizing maternal services to increase access without improving and enforcing minimal quality is unlikely to have an impact on access [34]. One of the main objectives of PBF is to improve the quality of care [35,36] but this quality has been observed more in structural than content quality [12,19]. Gradual changes are being seen in providers' relationships with their patients, and some structural changes, but there is still much work to be done. There is a need to focus on improving the content quality of care for ANC and skilled birth delivery. When women must shop around for ANC in various facilities – and then deliver in another facility, without proper referral procedures in place – this can reduce quality and undermine the very essence of the primary healthcare system in place and the efforts to achieve universal health coverage.

Advocating for some aspects of primary health care in a system that is financed primarily through out-of-pocket expenses and providing poor-content quality care can be challenging, as people make choices based on their purchasing power and the perceived quality of the care and their ability to pay for

quality. The PBF system should advocate for continuity of care by encouraging providers to employ good communication strategies that ensure patient retention, and this should be considered in the quality checklist of PBF indicators. Strategies are needed to ensure continuity of care because this is vital for quality, especially for ANC and skilled birth delivery.

Quality of care has implications for both PBF and the health system more generally. The issues of patient-provider relationships and communication patterns in care delivery, especially in public facilities, are a long-standing challenge in the health system in Cameroon and consumers remain sceptical, despite some of the changes made by PBF. This is something that the system has failed to manage, and appropriate measures are needed to improve quality, especially in primary health care. This may not only require a simple check list of quality indicators and verification process as employed by the PBF system, but more rigorous procedure that incorporates continuous training and strict supervision. The efforts to improve quality – and the use of a quality checklist and verification processes (which are not rigorous) as standalone mechanisms – are not sufficient to ensure optimal quality services. Most importantly respecting patient's privacy and confidentiality of their data is not only an ethical concern but critical throughout medical practice. There is a need for additional reinforcement, which may require (if necessary) a review of the curricula of medical students (especially nurses and midwives) trained in Cameroon. PBF is a supply-side strategy that targets health professionals and has been adopted as a national strategy. The quality standards and expectations of PBF should be reinforced within the curriculum to better prepare healthcare workers, especially in terms of patient-provider communication during skilled birth delivery, privacy and confidentiality of patient record, and care in general. This is important because emphasising quality in practice at the level of PBF indicators and verifications without ensuring it is also emphasised in the mindset from the onset and the training programmes would be much like treating the symptoms of a disease without considering the cause.

8. Strength and Limitations

The decisions made during the research process of this study – from the development of the research objectives to the interpretation of the findings – have been fully described to ensure the confirmability of the results. Feedback was received from all co-authors on the research objectives, questions, and analysis, as well as the interpretation of the findings. This was vital for establishing dependability and credibility, as the co-authors were able to highlight factual errors and competing interpretations in the manuscript. We also employed various methods of data collection from different settings (public, private, and confessional facilities) and from two sources (women and health care providers). This use of multiple data sources helped to provide greater depth and breadth to the study findings and minimize bias. Thus, data interpretation involved multiple perspective based on data gathered from different sources (see figures 5.5 & 5.6).

This study is limited to three districts in the SW region and was conducted in conflict affected region which may influence respondents' behaviour, however, multiple sources of data help to minimize bias in the results. In addition, this study is prone to recall bias and the findings from the logistic regression analysis should be interpreted with caution as there was limited statistical power.

9. Conclusion

The heterogenous nature of health seeking behavior calls for specific intervention strategies tailored to specific districts. PBF has the potential to improve quality of care to stimulate behaviour change in seeking care amongst certain group of women, but the changes seen thus far have primarily affected mostly structural aspects of quality of care. Cost and quality of care are important determining factor in the choice of seeking care for antenatal care and skilled birth delivery, however, quality of care (with a focus on patient-provider communication pattern) is important in the decision to use health facility for subsequent skilled birth delivery. In addition, hospital length of stay (after delivery) is a determining factor for some women to use traditional birth attendants for delivery.

Contributions: MN conceived the idea for the paper, conducted data collection, analysis, investigation, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. RD, RP, and RG critically revised the manuscript and provided feedback. All authors reviewed and agreed on the final version of the manuscript.

Acknowledgement: Thanks to department of Epidemiology and Mobility bursary at Ottawa University and my supervisors for financial support to facilitate data collection. We would like to thank the district health team, health administrators from the participating districts, the PBF regional office for southwest region and research assistants who assisted in data collection.

Funding: This study received partial financial support from thesis supervisors to facilitate data collection

Competing Interest: None declared

Patient and Public Involvement: No patient or public involvement

Data Availability: Data relevant for the study is included and/or attached as supplementary material

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Supplemental Table

Table 5.13. Equity category based on accessibility

	Limbe district n=316					Buea n=258				Tiko n=249				
	Public	Private	Con- fessional	Para public	N	Public	Private	Con- fessional	N	Public	Para Public	Private	Con- fessional	n
	n (%)	n (%)	n%	n (%)	N	n (%)	n (%)	n (%)		n (%)	n (%)	n (%)	n (%)	
1 Difficult in all seasons	19 (6)	18 (5.7)	0 (0)	16 (5)	53	0 (0)	0 (0)	0 (0)	0	0 (0)	4(1.6)	0 (0)	0 (0)	4
2 difficult in Raining season	30 (9.5)	0 (0)	0 (0)	18 (5.7)	48	23(9)	0 (0)	0 (0)	23	5(2)	11 (4.4)	0 (0)	0 (0)	16
3 Moderately accessible	5 (1.6)	0 (0)	0 (0)	0 (0)	5	13(5)	0 (0)	0 (0)	13	5(2)	14 (5.6)	0 (0)	0 (0)	19
4 Accessible	18 (5.7)	18 (5.7)	0 (0)	0 (0)	36	0 (0)	0 (0)	0 (0)	0	24(9.6)	16(6.4)	0 (0)	0 (0)	40
5 Very accessible	49 (15.5)	104 (33)	9 (2.8)	12 (3.8)	174	96 (37.2)	76 (29.4)	50(19.4)	222	124 (50)	11 (4.4)	18 (7.2)	17 (6.8)	170

Figure 5.3. Antenatal clinic at a health facility, Tiko district



Photo credit: Valentine

Figure 5.4. Maternity ward in public facility, Tiko district



Photo credit: Valentine

Figure 5.5 Study design: Triangulation mixed method

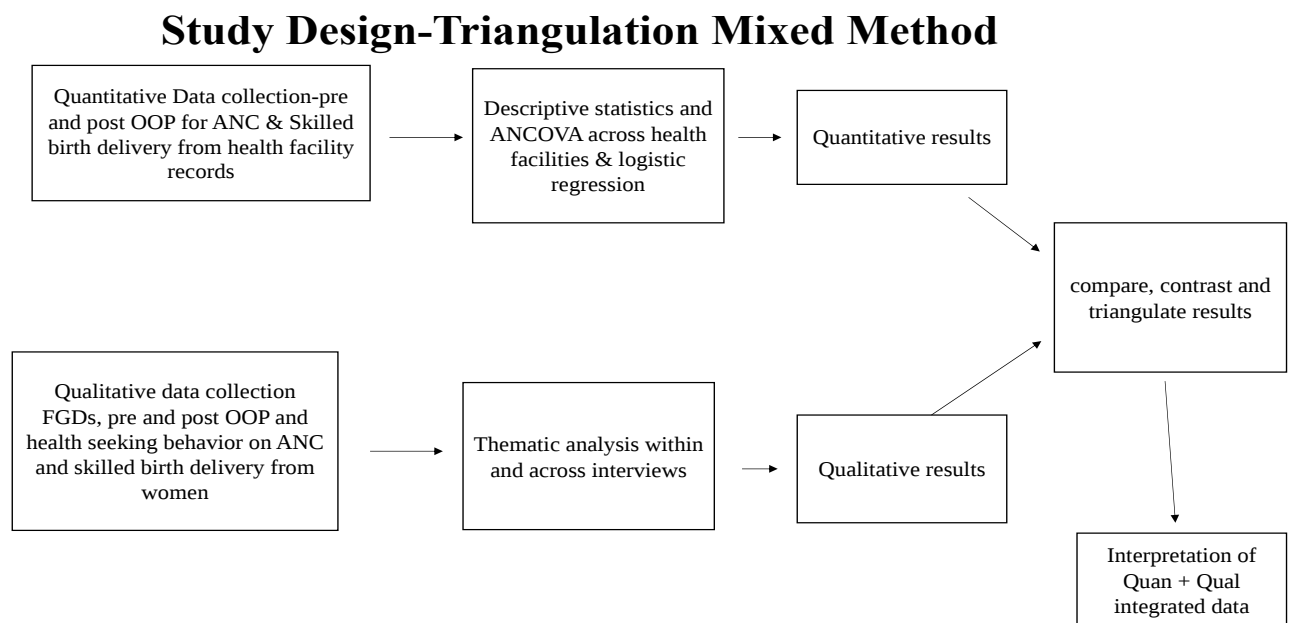
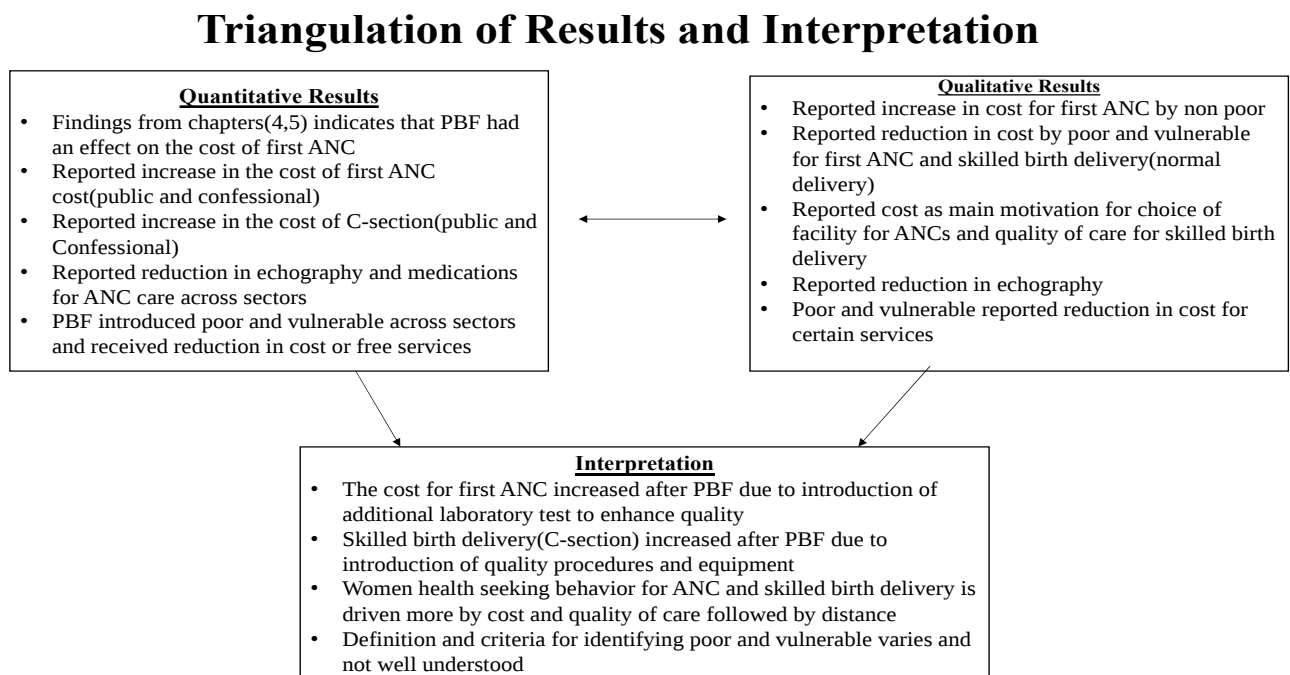


Figure 5.6 Triangulation of results and interpretation



Chapter 6

Mind the Data Gaps: Can Performance-Based Financing Enhance “Better Data for Better Health” for Maternal Health Services in Cameroon?

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1. Preface

This chapter compares the coverage and completeness of data on maternal health service delivery between a performance-based financing data base and (1) the national health information system and (2) health facility registers in the three study districts. It reports on data availability, reporting and record keeping based on experiences from the field. It provides a situational report on data on antenatal care, skilled birth delivery and family planning collected from 2010 to 2020, limitations, and challenges. Drs Yaya and Little supervised the design and methodology and critically revised the manuscript. Dr. Kasonde provided subject matter expertise and revised the manuscript. Drs Deonandan and Pongou critically revised the manuscript. All authors read and approved the final manuscript, which has been submitted to BMC Health Service Research.

Status of the Manuscript: Submitted to BMC Health Service Research

Ethics Approval: Approved

2. Abstract

Objective: To compare the coverage and completeness of data on maternal health service delivery between a performance-based financing data base and (1) the district health information system (DHIS2) and (2) health facility registers in Cameroon

Method: Audit of data on antenatal care, skilled birth delivery and family planning collected from 2010 to 2020 in three purposively selected districts (Buea, Limbe and Tiko) in the southwest region of Cameroon. The coverage and completeness of data from the performance-based financing database, the district health information system (DHIS2, a national system) and health facility registers were compared. Data sources for the performance-based financing database and the district health information system are based on data generated from health facilities.

Results: Among the 90 health facilities in the three districts, 13 (14.5%) facilities could not be accessed due to ongoing conflict. Therefore, data were collected from 77 health facilities. Of the 77 facilities, half were public, a third private, and the remainder para-public (13%) or confessional (5%). Approximately seven registers at each health facility included data on maternal and child health. Problems of these data included incomplete coverage, misplacement of records, and incomplete data in the records identified. Not surprisingly, there was inconsistency across all sources. DHIS2 collects antenatal care only for the first and fourth visits and PBF collects data for any antenatal care visits without specifying the visit number and health facility collects for all antenatal care visits.

Conclusion: Generally, we noted important gaps and heterogeneity in data reporting as well as incomplete data across health sectors and districts. Understanding the need to collect reliable, complete and actionable data would enable improvement in record keeping, and monitoring of quality of care and health outcomes.

Key Questions

What is Already Known on this Topic?

- One of the strengths of the PBF program, as documented in previous studies, is that it complements the country's health information system. While many studies have looked at PBF implementation processes and effects, there is an empirical research gap investigating the ways PBF can lead to “better data for better health” by influencing the quality of data collection at the same time as enabling data capture by DHIS2, a health information system used widely in sub-Saharan Africa.

What are the Implications of the Findings?

- DHIS2 and the PBF database have improved on data coverage in Cameroon, however, there remains limitations and incompleteness in data.
- There is need to transform the way data are collected at health facilities but also the need for capacity building and better data governance to improve data quality and use. This will ensure that reliable, consistent, accurate, and actionable data are available to inform policy towards achieving Universal Health Coverage.

3. Introduction

In recent decades, the value of the data journey, from collection, storage, analysis and use has been emphasised to data collection, processing and quality assurance, storage, analysis, and use (both for the original and additional purposes) have been a global concern for supporting timely decision-making, appropriate policies, and interventions, improved health outcomes, and universal health coverage [1-9]. Concern about these issues are especially pronounced in Sub-Saharan Africa, where limited investment in health information systems leaves the health systems relying on outdated, paper-based systems [4,5,7]. Data utilization requires that data be collected, processed, and analyzed in a way that it is accessible to those who need it, when it is needed [1,10]. The burden of maternal morbidity and mortality in sub-Saharan Africa requires reliable, consistent, and actionable data to inform appropriate interventions and policies for better health outcomes.

Health management information systems have been implemented in several countries across sub-Saharan Africa with a view to providing reliable data to help improve health service delivery, including maternal and child health care. The District Health Information System (DHIS2) is one of the most widely used health management information system in Sub-Saharan Africa. The system is a repository for aggregate data on health indicators including those relating to maternal health that is most useful for national level decision making [10,11]. However, not infrequently healthcare workers and managers in sub-Saharan Africa are unable to make adequate use of the collected data, despite being trained in the use of DHIS2 [10]. Moreover, there are few detailed descriptions on the extent and the way the system is used [10]. It appears that data generated from the DHIS2 are rarely used for decision-making at the facility level or amongst health managers [11-15]. The performance-based financing (PBF) implemented in many sub-Saharan Africa involves a process of data verification and validation. One of the strengths of the PBF program, as documented in previous studies, is that it complements the country's health management information system [17].

Cameroon is a lower middle-income country in Sub-Saharan Africa with a population of over 25 million people [16]. Based on information gathered from the district health team, the DHIS2 system was introduced in Cameroon in 2017. Cameroon adopted performance-based financing (PBF) as a national strategy for achieving universal health coverage in 2017, following a pilot implementation in 2012 [18].

Data generated from PBF program are subject to some level of verification at the health facility and additional verification processes and counter verification. Although some studies have examined PBF implementation processes and the effects on outcomes, there is an empirical research gap investigating the ways PBF can lead to “better data for better health” and influenced the quality of data collected. This paper aims to describe and compare the three data bases and presents the strengths and limitations of each database and weaknesses in using each of them. The paper examines the role of PBF in improving data quality at the district level with a focus on antenatal care, skilled birth delivery, and family planning. The paper compares and triangulates three data sources and presents the strength and data gaps and challenges of the three data sources from health facilities, the DHIS2 system, and PBF data from three health districts in Cameroon. It also presents the role of PBF in complementing and improving data quality for maternal health services and discusses limitations and gaps across the data sources.

4. Methodology

This study is part of a larger research study conducted in the Southwestern region of Cameroon. This region has 18 health districts, from which three (Limbe, Buea and Tiko) were purposively selected. Purposive selection was to ensure districts that were included in the pilot PBF study were included in the present study. In addition, because the ongoing conflict limited access to certain regions, the selected districts were relatively accessible compared to the other districts that had been included in the PBF pilot study. Three districts from the region had been included in the PBF pilot study in 2012, but one of the districts was not accessible at the time of the present study due to the ongoing conflict since 2017 [18]. Thus, two districts (Limbe and Buea) included in the PBF pilot study and associated impact evaluation

were included in the present study plus a third district (Tiko) that enrolled into PBF following national adoption of the policy in 2017. Based on PBF records at the time of this study, there were 35 health facilities in Limbe, 35 in Buea, and 20 in Tiko. Health care is delivered in public, private (for profit), confessional (Faith based) and para public (public-private partnership) health facilities.

All health facilities enrolled in the PBF program were eligible for inclusion. Only newly registered health facilities not yet enrolled in the PBF were excluded. For example, some health facilities may get accreditation from the regulatory body to operate but had not yet signed the contract with the Contracting Verification Agency responsible for PBF or were still in the process of enrolling into the PBF program. Data for antenatal care (ANC), skilled birth delivery and family planning was collected from three sources, namely health facility registers, the district health information system (DHIS2), and the PBF database. We used the data from the health facility, which is also the source of all data collected in the other two databases (PBF and DHIS2). The health facility data therefore served as the reference data. It should be noted that the data that are entered into the PBF database are generated from the health facility registers. This health facility registers include registers recommended by PBF, for example, poor and vulnerable registers, as well as registers provided by the ministry of public health. However, the PBF data undergo additional verification and validation processes to ensure the data that are entered into the PBF database align with what has been documented on the registers. By contrast, the data that are entered into DHIS2 do not go through such verification process at the health facility, but rather the data are harmonized and submitted to the district team that is responsible for data validation before it is entered into the DHIS2.

Data on the number of antenatal care visits, normal deliveries, and C-sections were collected from all three data sources. Family planning data were collected only from the PBF records. The objective was to collect data from 2010 to 2020 to assess impact of the PBF on data completeness and coverage for the above indicators at the health facilities. However, the DHIS2 was only introduced in 2017 and PBF was implemented from 2012 in two districts, and from 2017 in the third. Therefore, we used a phased approach to collect and present the data as follows: i) we collected and compared data for the above

variables from the health facility registers across the three districts and by sector from 2010 to 2012, ii) compared health facility registers from 2012 when PBF was introduced to 2017 after the results of the impact evaluation and the adoption of the policy, and, iii) we compared data from all the three sources when the DHIS2(2017) was introduced across all the districts and same year all health facilities were expected to enrolled into PBF.

4.1 Health Facility Register

Health facility registers are the main source of the DHIS2 and PBF databases and collect data in paper format. The health district represents the operational unit of health policy, and the health center is the first point of contact with the health system [6]. Data are collected at health facilities. All providers engaged in the consultation process are responsible for filling in the registers. All the health facilities submit monthly reports collated across registries to the district, and the district team compiles and synthesizes the facility reports for DHIS2 and then forward them to the regional level. The region in turn forwards the data to the national level, where they are processed and stored. There are approximately seven registers at each health facility into which data on maternal and child health are entered. These separate registers include consultation, labor and delivery, home visit register, admission, minor surgery, antenatal care visits, and family planning. There are additional separate registers for consultation, labor and delivery, ANC, and family planning for patients deemed by the PBF team to be “poor and vulnerable”. The consultation register is designed to collect about 24 core items for each consulting patient: date, new case, month, name, vital signs, sex, age, marital status, pregnancy, code (year of birth), profession, residence, contact, history, signs and symptoms, presumed diagnosis, investigation (lab), lab results, treatment, confirmed diagnosis, ambulatory hospitalization, receipt number, referral, and observation. The home visit registers enter information on households that were visited for the specific health areas by health care workers, monthly. This includes the nature of the visit, address and household and rationale for the visits. The antenatal care registers enter information for all visits and the delivery registers enters information on the type of delivery performed and family planning.

We collected total deliveries and ANC visits from each health facility. We observed that most, but not all the facilities summed the total deliveries for each month. However, we performed an independent count to validate the total entries reported. For facilities that did not sum the total, we did the counting and validated with the health administrators.

4.1.1 District Health Information System (DHIS2)

The DHIS2 was implemented in 2017 in Cameroon. Before this, there was another information system that was used that is not well documented. The DHIS2 is the national health information system and is implemented in all districts. It collects routine population data for various performance indicators, including data on the number of skilled birth deliveries, ANC visits, and family planning. However, the DHIS2 only collects data for first and fourth ANC visits. Data are supposed to be entered into the DHIS2 monthly by a specialized team. This data from the health facility registers is collated and reported monthly to the district health team. The data are then entered into the DHIS2 by the district health team and validated routinely by the team for accuracy and consistency.

4.1.2 PBF Data

Data for the PBF database are collected from health facilities and entered into the electronic system by the PBF team. There is an incentive system for PBF data based on predefined criteria and checklist. A health facility gets marked down if it submits poor or incomplete data for an indicator, as indicated by detected documentation errors of 10% or more (i.e. above the defined “margin of error”), and will lose the incentive payment for each specific indicator. Specifically, PBF clinical verifiers verify the data, and there is a process of counter-verification and validation before the data are entered and confirmed into the PBF database. Thus, after verification by the PBF verifier, there is a counter verification by internal PBF staff, followed by another validation by the PBF regional manager and at the central level. PBF verifiers will contact health facilities ahead of time to ensure their registers are ready for the monthly verification. This data verification and validation process quantifies the data production for each facility and the incentives earned for each variable for the month using the predefined criteria and checklist.

4.2 Data Collection and Analysis

Data were collected for yearly antenatal care visits (for the first to the fourth visits), normal deliveries, and caesarean-sections(C-Section) from health facility registries with the help of research assistants and health facility administrators. Data from the DHIS2 were extracted by the district data manager for the first and fourth antenatal care visits, normal deliveries, and C-sections. Thus, the DHIS2 data were provided to us by the district team. We did not have direct access to the DHIS2 database; therefore, we did not validate the numbers provided to us. However, the district team confirmed that the data has been verified.

Data from the PBF database was provided by the PBF team. The PBF team provided the data from the PBF DHIS2 platform exported in an Excel format for the studied variables from 2012 to 2020. We extracted data for all antenatal care visits, normal deliveries, C-sections, and family planning (for new and old users, IUD, and implant). For each variable, PBF data are categorized into claimed and verified status. Claimed data are based on what the health facility reported as the number of utilizations of health services indicators for the reporting month, whereas validated data are based on what the PBF team verified and validated using pre-defined quality criteria. These predefined quality criteria include detection of errors in counting, and incorrect or missing fields in patient information. Health facility registers are the basis of all data in the PBF and DHIS2 system, however, due to poor record keeping at health facilities (which is paper based--Appendix T) we used the data from PBF as our reference (stored in electronic format) and most reliable data for the selected variables given the quality of the data and counter-verification process for PBF. We calculated the difference in reporting for claimed and validated data and compared this with the data from the DHIS2 and health facilities to validate the difference in the output and assess the gap in reporting across data sources. We therefore subtracted the total number of claims from the validated reports for each variable to obtain the difference in reported data. We then used the validated number as the reference and compared this with data from the DHIS2 and health facilities. Because the Tiko district did not enroll in PBF until 2017, we compared data for all the three districts from 2018–2020. For the two districts that were enrolled into PBF since 2012, we did a second

comparison of data for the two districts from 2012–2016. We generated graphs to observe ANC visits and skilled birth deliveries across sectors in the three districts.

4.3 Ethics

The Bruyere Research Institute at the University of Ottawa approved the study (# M16-18-057), and administrative clearance was obtained from the Faculty of Science, University of Ottawa (#H-02-19-2829). In Cameroon, we obtained ethical approval from the University of Buea Faculty of Health Sciences (Ref 2020/1342-02/UB/SG/IRB/FHS) and administrative clearance from the regional delegation of public health in the Southwest region (Ref R11 MINSANTE/SWR/RDPH/PS864/715).

5. Results

Among the 90 health facilities in the three districts, 13 (14.5%) facilities could not be accessed due to ongoing conflict. Therefore, data were collected from 77(85.5%) health facilities. Of the 77 facilities, half were public, a third private, and the remainder para-public (13%) or confessional (5%) (Table. 6.1). There are approximately seven registers at each health facility included data on maternal and child health. Data were collected from the DHIS2 database from 97 facilities across all three districts (table 6 .1 below). For PBF database, data were collected from 39 PBF facilities from 2012 to 2014 in Buea and Limbe, and from 86 facilities from 2015 to 2020 in all three districts

The results of analysis of data collected from 2010 to 2012 from health facilities indicate that none of the health facilities was able to present data from 2010 to 2012 for antenatal care variables. However, some health facilities in Tiko district had data for skilled birth delivery from 2010 to 2012. Buea and Limbe had data for skilled birth delivery only from 2012 (see Table 6.1). Most facilities could not locate the records from 2010. Some reported that records had been burnt as a result of the ongoing conflict. In other facilities, staff reported that they had been newly hired, and so did not know where the registers were kept.

From 2012 to 2017 when PBF was implemented in Buea and Limbe, most facilities were able to present data though in most the data were incomplete. Most facilities were unable to provide complete data per year, especially before 2018. The main reason reported was the inability to locate the registers, although some facilities in Buea district attributed this to the ongoing conflict. A problem across all health facilities and sectors reported by some health administrators was that they had hired new staff who could not locate the registers. Some of the counting had irregularities in summing and data entry, and we usually notified the health administrators when we observed these irregularities, for example, in some facilities we observed that number of still births was included in the counts for deliveries and live births.

From 2018 to 2020 when PBF was rolled out to all health facilities and the DHIS2 was introduced at the district level, most facilities were able to present facility registers with more complete data. However, we observed that DHIS2 collects antenatal care only for the first and fourth visits and PBF collects data for any antenatal care visit without specifying the antenatal care visit number. This is an important gap; given that PBF does not disaggregate the number of antenatal care visits attended, it was challenging to compare the data from all three data sources for antenatal care visits.

Table 6.1. Number of health facilities that provided data on antenatal care and type of delivery, by district and data source, 2010–2020

Antenatal care																							
Buea								Limbe								Tiko							
Health facilities					DHIS2 N(39)		PBF	Health Facilities				DHIS2 N(35)		PBF	Health Facilities				DHIS2		PBF		
Year	ANC1	ANC2	ANC3	ANC4	ANC1	ANC4	Any ANC	ANC1	ANC2	ANC3	ANC4	ANC1	ANC4	Any ANC	ANC1	ANC2	ANC3	ANC4	ANC1	ANC4	ANY ANC		
2010	-	-	-	-				-	-	-	-				-	-	-	-			N/A		
2011	-	-	-	-				-	-	-	-				-	-	-	--					
2012	6	6	6	6	N/A	N/A	20	-	-	-	-	N/A	N/A	19	-	-	-	-	N/A	N/A	N/A		
2013	8	8	8	8	N/A	N/A	14	-	-	-	-	N/A	N/A	10	2	2	2	2	N/A	N/A	N/A		
2014	12	12	12	12	N/A	N/A	20	2	3	3	3	N/A	N/A	18	2	2	2	2	N/A	N/A	N/A		
2015	14	14	14	14	N/A	N/A	30	19	19	19	19	N/A	N/A	29	3	3	3	3	N/A	N/A	N/A		
2016	20	20	20	20	N/A	N/A	35	8	8	7	8	N/A	N/A	35	10	9	9	10	N/A	N/A	N/A		
2017	27	27	27	27	32	26	N/A	22	19	19	19	24	21	N/A	10	10	10	10	13	12	N/A		
2018-2020	27	27	27	27	34*	31*	32*	30*	28*	28*	29*	27*	26*	35*	13*	13*	13*	13*	16*	15*	16		
Types of skilled birth deliveries																							
Buea								Limbe								Tiko							
Health Facilities				DHIS2		PBF		Health Facilities				DHIS2		PBF		Health Facilities				DHIS2		PBF	
	ND	C-S		ND	C-S	ND	C-S	ND	C-S			ND	C-S	ND	C-S	ND	C-S		ND	C-S	ND	C-S	
2010	-	-						-	-							4	1						
2011	-	-						-	-							5	1						
2012	6	6		N/A	N/A	20	4	-	-			N/A	N/A	19	1	5	1		N/A	N/A	N/A	N/A	
2013	9	9		N/A	N/A	14	3	1	-			N/A	N/A	10	1	5	2		N/A	N/A	N/A	N/A	
2014	12	12		N/A	N/A	20	3	5	-			N/A	N/A	18	1	4	2		N/A	N/A	N/A	N/A	
2015	14	14		N/A	N/A	30	6	16	1			N/A	N/A	29	2	4	2		N/A	N/A	N/A	N/A	
2016	20	20		N/A	N/A	35	6	12	-			N/A	N/A	42	3	7	2		N/A	N/A	N/A	N/A	
2017	27	27		28	6	N/A	N/A	24	2			24	2	N/A	N/A	9	2		13	6	N/A	N/A	
2018-2020	27	27		34*	14*	32*	2	34*	2			27*	5*	35*	2	15*	5		16*	7*	16	3	

ND-Normal delivery; C-S- C-Section.All antenatal data for PBF is considered in this study as ANC1 because PBF does not disaggregate the data for ANC. Incomplete data were reported from most facilities that reported from 2017-2020 -*not all facilities provided data in 2018 &2019.N/A -does not provide the services

Table 6.2. PBF data showing claimed and validated number for ANC, normal deliveries, and C-Sections, 2012–2016, Buea district

	2012			2013			2014			2015			2016		
	Claimed	Validated	Diff	Claimed	Validated	Diff	Claimed	Validated	Diff	Claimed	Validated	Diff	Claimed	Validated	Diff
Any ANC	3248	3565	-317	7135	7118	17	8014	8008	6	8630	8585	45	15099	15048	51
Normal	1250	1222	28	1214	1211	3	2338	2307	31	2633	2585	48	2719	2689	30
C-section	146	146	0	102	102	0	426	427	1	465	464	1	491	489	2
Difficult	N/A	N/A		N/A	N/A		113	122	-9	125	107	18	66	60	6

N/A-implies there was no reported data for that year

Table 6.3. PBF data showing claimed and validated number for ANC, normal deliveries, and C-Section, 2012–2016, Limbe district

	2012			2013			2014			2015			2016		
	Claimed	Validated	Diff	Claimed	Validated	Diff	Claimed	Validated	Diff	Claimed	Validated	Diff	Claimed	Validated	Diff
Any ANC	3686	3689	-3	5832	5866	-34	7555	7516	39	8596	8576	20	9775	9780	-5
Normal	827	823	4	1316	1316	0	1780	1766	14	2051	2030	21	2067	2059	8
C-section	42	42	0	126	126	0	127	127	0	167	167	0	308	308	0
Difficult	N/A	N/A		N/A	N/A		49	49	0	64	61	3	304	302	2

N/A-implies there was no reported data for that year

5.1 Results for Health Facilities

Most facilities (up to 90%) had poor record keeping (figure 6.9) especially from 2010 to 2017. Some had misplaced the records, and some had incomplete records and generally poor data entry. This was common across sectors but more in public facilities. Overall, few facilities in any of the districts report C-sections. In Limbe and Tiko, a few facilities report normal deliveries, particularly para-public and some public facilities. Table 6.1 presents the number of facilities that provided data.

In view of the paucity of the records kept; we explored possible reasons with the Buea district team. One response was that,

“It beats my imagination to hear that some health facilities don't have complete data. Because we go out for quality assessment, using our quality checklist which they know they have. We go out for routine supervision we go out for some kind of supervision like malaria surveillance, so if they should say they don't have data, I doubt what might be they themselves don't know what it means by having data. Because all the data is there, they have it, and they have their registers, So, it's something I don't know how I should put it, how can they say that? from the first to the fifth, they bring their monthly reports weekly. Weekly is every Tuesday before 11am. Now, we now at the district we have from the fifth to the 10th. We make syntheses and forward it to the region and at the region they forward it to the regional delegation”.

The graphs below illustrate the trend based on the number of facilities that provided data across the districts over time. Most facilities were able to provide data from 2017 to 2020, but some facilities provided incomplete data and registers for some specific months could not be found. Figs. 6.1–6.3 illustrate data that was collected for antenatal care visits from health facilities across sectors.

Figs. 6.1–6.3 Antenatal care visits from health facilities from 2012–2020.

Figure 6.1. Antenatal care visit from health facilities, Buea district, 2012–2020

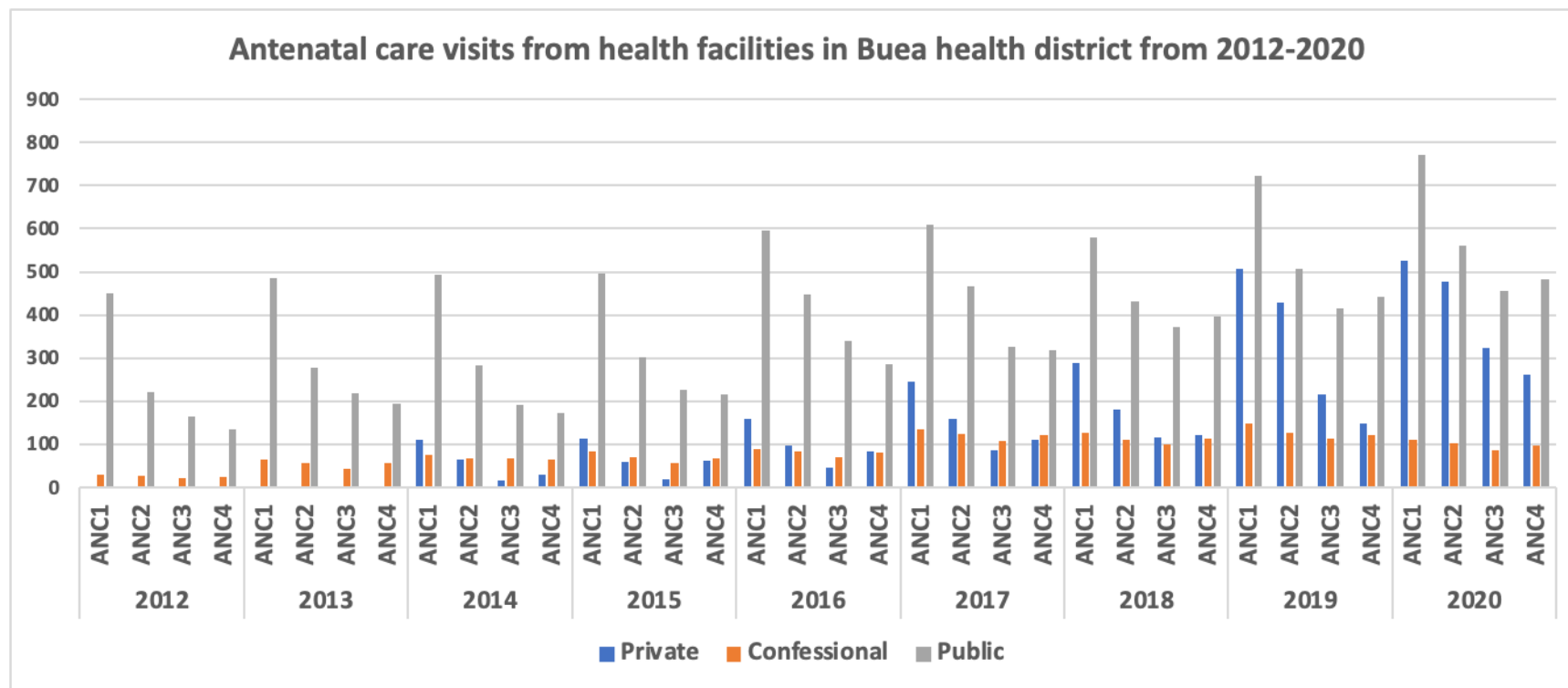


Figure 6.2. Antenatal care visits from health facilities, Tiko district, 2013–2020

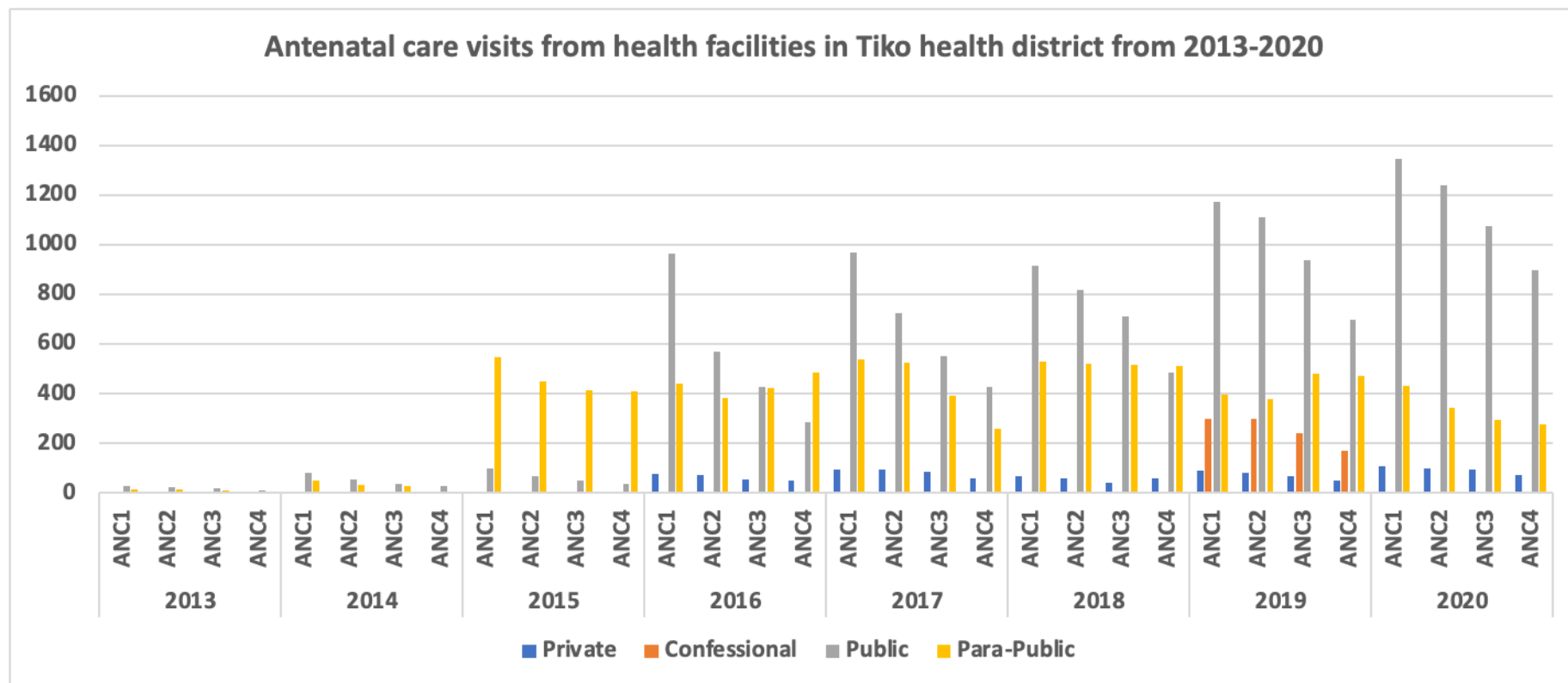
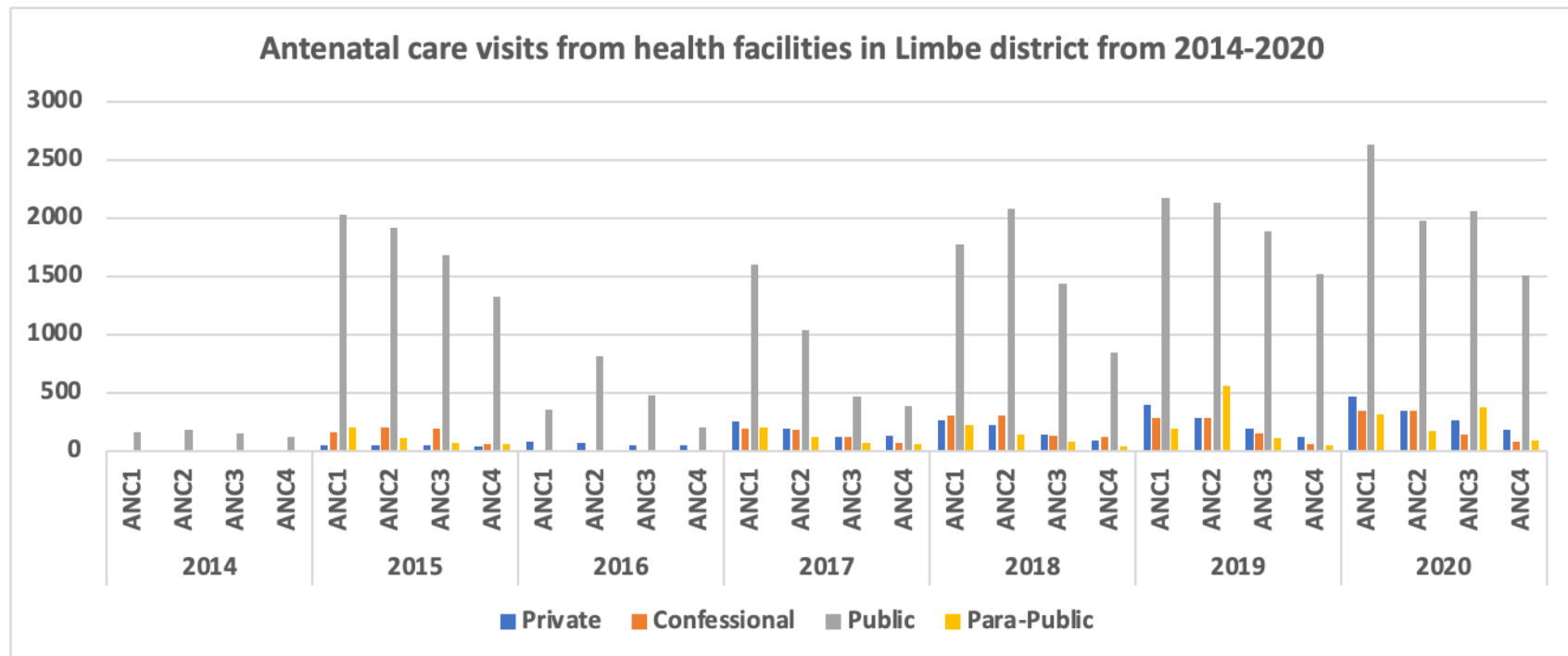


Figure 6.3. Antenatal care visits from health facilities, Limbe district, 2014–2020



5.2 Results for DHIS2 Data

The DHIS2 only collects data on ANC for the first and fourth trimester. Thus, we were unable to generate a graph for ANC because DHIS2 data does not reflect the actual trend in relation to the other data sources. The assumption is that every woman who attends the fourth antenatal care visit is likely to have attended three visits before attending the fourth. This may appear to be a reasonable assumption, but it is important to consider other aspects such as the timing of the antenatal care visits. Foreexample, a fourth antenatal care visit may not actually be based on the timing in pregnancy as per guidelines, but a result of multiple referral requests, or the number of visits attended per woman over the course of the pregnancy

The DHIS2 frequently had missing data reports from facilities for several months in each year. In addition, the DHIS2 collects data from all facilities even if they are not yet enrolled in PBF because they need to synthesize the data and forward it to the region. Thus, some facilities may be included in the DHIS2 database but are not reflected in the PBF data; this may be one of the reasons the DHIS2 data seems to include more facilities than the other data sources (Figs. 6. 4 & 6.5).

Figs. 6.4 & 6.5 Data Comparison for Normal Deliveries and C-Section from 2018 to 2020

Figure 6.4. Normal deliveries from three data sources across three districts, 2018–2020

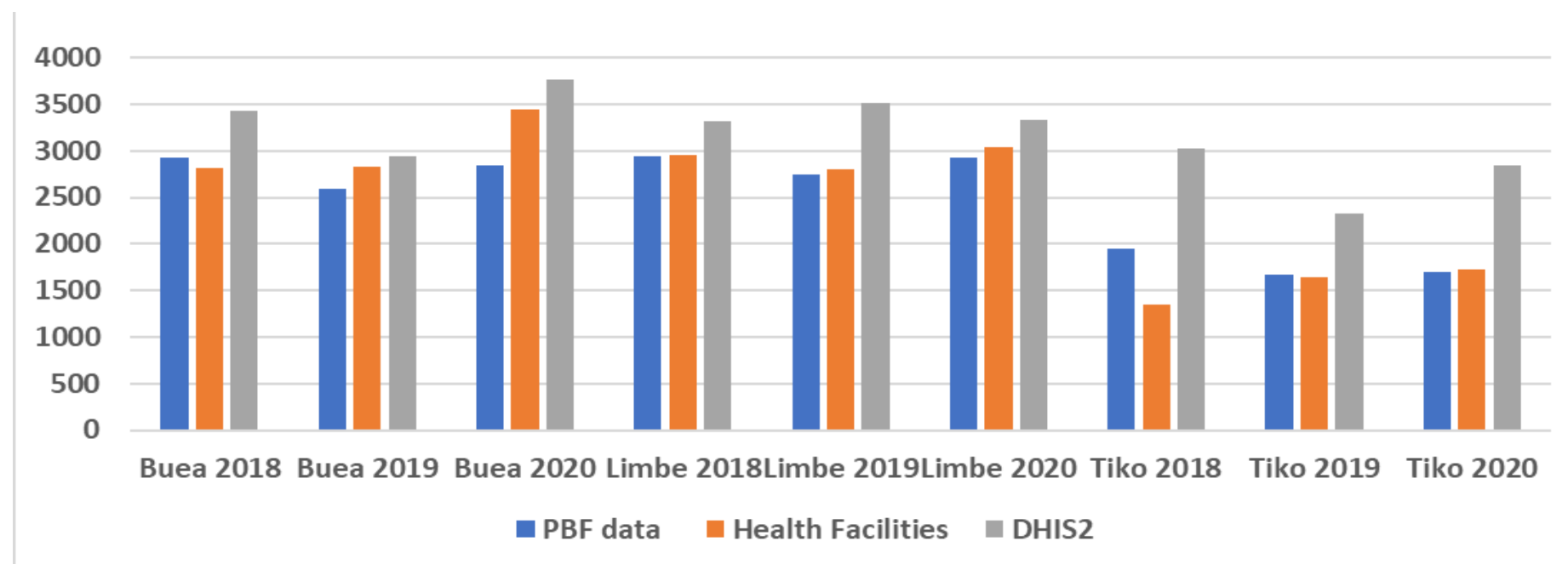
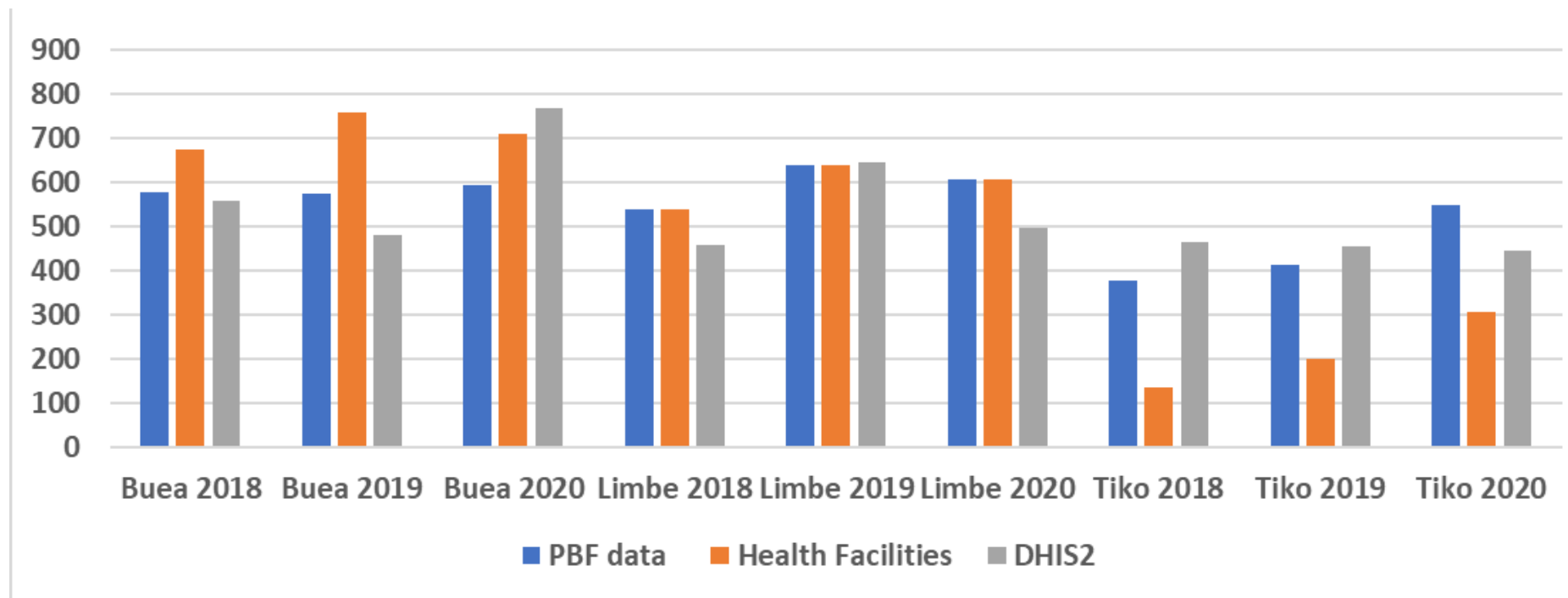


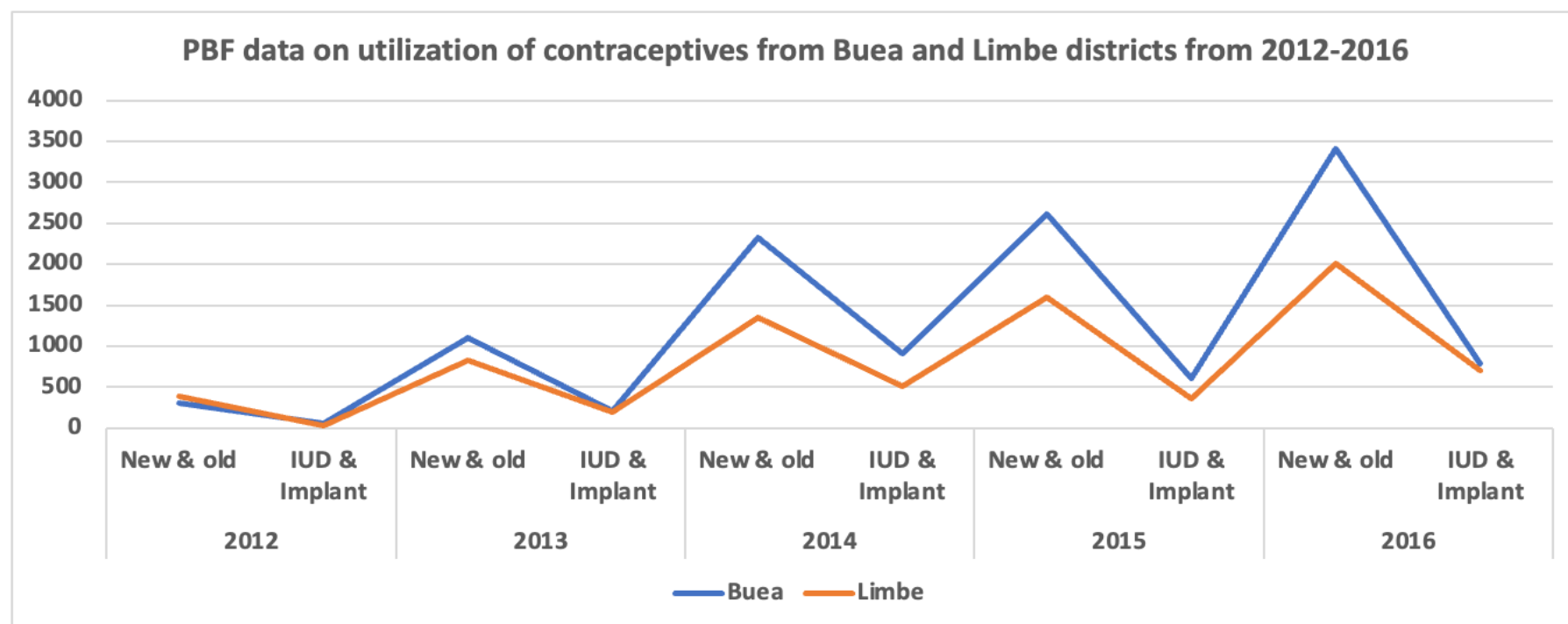
Figure 6.5. C-sections from three data sources across three districts, 2018–2020



5.3 Results for PBF Data

For antenatal care, PBF includes data for any antenatal care without disaggregating by trimesters. As such, we could not triangulate the data sources for antenatal care with data from the health facilities and DHIS2 as both DHIS2 and PBF data sources have limitations in the way antenatal care data are entered. Some incomplete reporting was also observed for several months in the PBF data from certain facilities. PBF reports include a wide range of information for each variable. The consistently poor data entry is reflected in Tables 6.2 and 6.3 and details the differences in the claimed and validated numbers for Buea and Limbe over the period 2012-2016. This discrepancy in counting constitutes one of the elements of the margin of error that PBF uses for quantity and/or quality bonuses for health facilities. There were more discrepancies in 2012 (the year PBF started) than in subsequent years, and C-sections were observed to have little to no difference between the claimed and validated numbers. Family planning data are based only on validated numbers and shows a progressive trend toward the utilization of birth control pills versus the IUD and implant methods (Fig. 6.6).

Figure 6.6. PBF data on use of contraceptives, Buea and Limbe districts, 2012–2016



6. Data Gaps across the three data sources

6.1 Three Important Data Gaps

6.1.1 Inconsistency in Type of Data Collected

PBF data reports any ANC visit, while DHIS2 data only collects first and fourth ANC visits, and health facilities provide reports for each ANC visit for each month, though the data were incomplete. This inconsistency of data collection is an important gap that hinders data triangulation and the generation of more robust, evidence-based data to inform appropriate intervention strategies. The PBF database does not report specific ANC visits and therefore does not provide information that could guide policy and intervention strategies for access to antenatal care over time. In addition, limiting data to ANC one and four, as in the DHIS2 data, does not help identify the weak points across antenatal care continuum, especially because health facilities keep paper records, and the only digital platform is the DHIS2. Moreover, it is not clear if ANC four is in the third trimester or just number of times a woman attended ANC which may be related to complications or referrals. Similarly, it is not clear if ANC one (across all three data sources) is in the 1st trimester or the first time the woman attended ANC.

6.1.2 Incomplete Data Collected

The lack of complete data and poor record keeping at the health facility registries could potentially have been addressed with data from the DHIS2 system which collects data from the health facility registers, but the DHIS2 is also, limited in its reporting capacities and has questionable quality. Most importantly, the data that is entered into the DHIS2 is collated from the registers; this process is prone to numerous errors, ranging from poor documentation, poor counting, loss of registers, poor quality control, and accountability mechanisms that fail to ensure that the data that is collected at the health facilities aligns with the data entered into the DHIS2.

6.1.3 Unreliable Data Collected

Generally, data from PBF (considered as claimed) should reflect the actual data for each variable for each month, taking into consideration the timely and counter verification process. However, if we consider the

poor documentation and counting errors, it is likely that the claimed data does not reflect the actual number of reported cases for a given variable. For example, PBF does not document the rationale for the error margin, therefore, it is not clear if the error was due to poor counting, or incomplete information to inform actual use of services. If a woman attended an ANC visit and due to poor documentation, some important variables were missed by the attending nurse, PBF would count it as an error, and this will not be included in the total validated number. This is a limitation in the way PBF reports the validated and claimed data to inform intervention strategies.

6.2 Role of Performance-Based Financing on Data Quality for Maternal Health Services in Cameroon

Based on Table 6.1, it is evident that the introduction of PBF has helped to strengthen the availability of data in some health facilities, especially as the source of the data that is entered into PBF is from the health facility registers. However, when compared to the number of health facilities that presented data in the PBF data base and the number of facilities that were enrolled into the pilot study, there were some discrepancies. For example, the expectation is that all the health facilities that were included in the pilot study in Buea and Limbe would have complete data for each specific variable. However, in Buea some facilities reported losing data due to the ongoing conflict, but not all facilities were directly affected by the conflict.

Though PBF data had more complete reporting for all facilities and for all months, there were some discrepancies in the number of facilities that reported for certain months in specific years. In addition, PBF data had some limitations in the way data are entered for certain variables; for example, data entry for antenatal care is entered as any ANC visit. This may be relevant for calculating PBF bonuses for health facilities, but it does not provide any information to support decision-making on antenatal care visits per trimester or describe how to best address problems or implement relevant interventions and trends in utilization overtime. ANC visits is an important indicator to monitor and track progress for maternal mortality and each ANC visit is an indicator that provides important information to policy and

intervention and should be disaggregated. Moreover, a focus on subsequent antenatal care visits would be an important aspect to consider ensuring continuity of care, which is an attribute of quality of care [19]. In addition, given that PBF does not provide bonuses for old consultations, this affects the way that some health facilities also enter data. Facilities would prefer to record or enter only new cases, and they do not enter follow-up cases for previous consultations and document follow-up cases only in the patient record notebook, not on the register. However, this data entry procedure is not encouraged by PBF because it affects continuity of care. Since PBF was introduced, most facilities have only one person who is responsible for completing the registers, creating margin of errors as seen in supplemental Figures 6.7 & 6.8). Now, facilities have realized the importance of sharing the task and training employees to manage the PBF program and to validate quantity indicators.

7. Discussion

As documented, most women are likely to attend ANC one (up to 80%), after which the trend continuously drops for subsequent ANC visits, reaching less than 40% for ANC four. As it is collected in health facility registers, ANC one data does not specify if it is from the 1st trimester; it is only assumed. Therefore, it is not clear if all the ANC one is in the 1st trimester as reported in the health facility registers, DHIS2 and PBF data. The timing of ANC is important to document because women can attend ANC one in their 2nd or 3rd trimester.

It should be noted that all the health facilities had issues with record keeping. Some facilities, especially in Buea, reported that the ongoing crisis contributed to loss of data because they were displaced from their facilities to tentative makeshift offices, and some facilities were burnt down. Although this may have contributed to the loss of data, record keeping nonetheless remains an issue because other facilities that were not directly affected by the ongoing conflict were also unable to provide data from 2010 to 2016. The ongoing conflict started in 2017, but the results reveal that there was still no reliable data from facilities before 2017, and the ongoing crisis has been more severe in Buea than in Limbe and Tiko. This suggests that the problem cannot solely be attributed to the ongoing political instability or

hired staff being new and unfamiliar with systems, as reported by some facilities. Rather, it is a need for capacity building with a focus on appreciating the importance of good data collection, record keeping, and data availability. Attention to these aspects of data is fundamental as countries are working towards achieving universal health coverage, and as a functioning health information system is described by the WHO as one of the six building blocks of strong health systems. This further provides an opportunity for investing in a digital health transformation, which most countries in Sub-Saharan Africa are aiming to achieve following the World Health Assembly Resolution on Digital Health in May 2018[20]. At the Assembly, Member States unanimously endorsed the value of digital technologies in advancing universal health coverage [20].

There are more questions to be asked as this study demonstrated the role of DHIS2 and PBF databases in improving data coverage and completeness over time compared to the health facility registers. However, there are still some gaps that requires important enforcement strategies on record keeping.

7.1 Implications for Policy and Practice

The DHIS2, which collects aggregated data, has not been as widely used by researchers and district teams as was intended [8-10]. This is largely because of poor leadership in data generation, monitoring, management, and information [8-10]. The quality of the PBF data compared to the health facility registers and DHIS2 are more reliable as it is available in digital format and the additional verification process involved, but still has its limitations. Most importantly, PBF data should take into consideration that antenatal care is one of the variables that was not impacted in the PBF impact evaluation assessment for Cameroon [18]. Therefore, more emphasis should be placed on disaggregated data for antenatal care to help elucidate the trend and obtain a better picture to identify any potential gaps to fill to improve subsequent ANC visits [19].

There is general lack of personnel engaged in data collection and entry. It is a labor-intensive task, and there are delays in reporting, poor record keeping, reliance on field staff, and little or no

incentives [22]. Generally, there is a large number of registers and reporting forms for district health facilities, and this is a potential burden on health workers which is not usually documented to estimate with some countries estimating that health workers spend as much as 15 hours a month on data collection efforts alone [22,23]. Though there is some incentives associated with PBF data, still, duplication of efforts, delays in reporting, poor record keeping, reliance on field staff, and little or no incentives all contribute to the paucity of reliable and actionable data in many primary health care (PHC) facilities [22,23]. An important question for policymakers is the extent to which data generated at the district level can inform sub-national and national level statistics reliably and provide data that is accurate, actionable, and timely for effective decision making at all levels.

The government should invest on data governance, data collection and record keeping at all levels. The high maternal mortality rate in Cameroon requires reliable, complete, and actionable data to help identify specific needs and areas for intervention and how to strategize interventions towards reducing maternal mortality. In addition, duplicating the DHIS2 for programs like PBF that are running at a national scale without proper mechanism to integrate the verified data into the national DHIS2 to strengthen the overall health management information system is not efficient, but rather parallels the existing structure. After verification of PBF data, the government should introduce interoperability layers to ensure that verified data from PBF DHIS2 platform can be pushed into the national DHIS2 system. This can be introduced to other similar programs that are running at a national scale, especially programs that generate data that are relevant to the national health management information system. This will also help support health facilities in their effort to collect reliable data and record keeping and the government can better monitor areas where there is need for data intervention.

Following the WHO Assembly resolution in 2018, Cameroon launched its digital health framework for 2020–2024 [21]. Upholding and fully implementing this framework will not only involve the need for data transformation but also investment in improved capacity building and data governance for better data generation and utilization to ensure that reliable, consistent, accurate, and highly disaggregated data are

available for decision makers at all levels. Most importantly, there is a need to promote an evidence-based culture that uses data to inform practice and policy. Cameroon needs to invest in improving health information systems, and the district team needs to be empowered regarding the role and the use of health data and how to use it. If the health facilities and district team do not understand why they collect data, its purpose, and how to use it to improve clinical practice and local decision making and thus the quality of care and health outcomes, they will not understand the need to collect reliable and complete data. Moreover, national data statistics are informed by data from the sub-national and district levels; thus, if the data from health facilities is not complete and accurate, the information produced at the sub national and national level may not completely reflect the actual situation.

8. Strengths and Limitations

This paper covers three data sources and three districts and includes data from over 85% of the health facilities in the three districts. It also provides insights into the challenges that may be faced by other districts in this region and offers a starting point for researchers to understand how to approach data collection from these three sources for future studies. Though we were unable to access up to 15% of the facilities in the three districts, the results can nonetheless be generalized for these districts given that we accessed over 80% of the facilities. Also, we triangulated the data with the other data sources (PBF and DHIS2) where we got data that included facilities that we were unable to access. The quality of DHIS2 reporting may represent a limitation as we could not personally access the database to validate the counting, however, the results compared to the health facility and PBF indicates the consistent counting error and poor record keeping.

9. Conclusion

The introduction of PBF has helped to strengthen the availability of data in some health facilities, especially as the source of the data that is entered into PBF is from the health facility registers. Generally,

we noted important gaps and heterogeneity in data reporting as well as incomplete data across health sectors and districts. There is need to transform the way data are collected at health facilities but also the need for capacity building and better data governance to improve data quality and use. This will ensure that reliable, consistent, accurate, and actionable data are available to inform policy towards achieving Universal Health Coverage.

Contributions: MN conceived the idea for the paper, conducted data collection, analysis, investigation, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. RD, RP, RG and MK critically revised the manuscript and provided feedback. All authors reviewed and agreed on the final version of the manuscript.

Acknowledgement: Thanks to department of Epidemiology and Mobility bursary at Ottawa University and my supervisors for financial support to facilitate data collection. We would like to thank the district health team, health administrators from the participating districts, the PBF regional office for southwest region and research assistants who assisted in data collection.

Funding: This study received partial financial support from thesis supervisors to facilitate data collection

Competing Interest: None declared

Patient and Public Involvement: No patient or public involvement

Data Availability: All data relevant for the study is included and/or attached as supplementary material

List of abbreviations

IUD.	Intrauterine device
DHIS2	District health information system
ANC	Antenatal care
WHO	World Health Organization
C-section	Cesarean section
PBF	Performance-based financing

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Supplemental Figures

Figure 6.7. PBF data, Buea district, 2012–2016

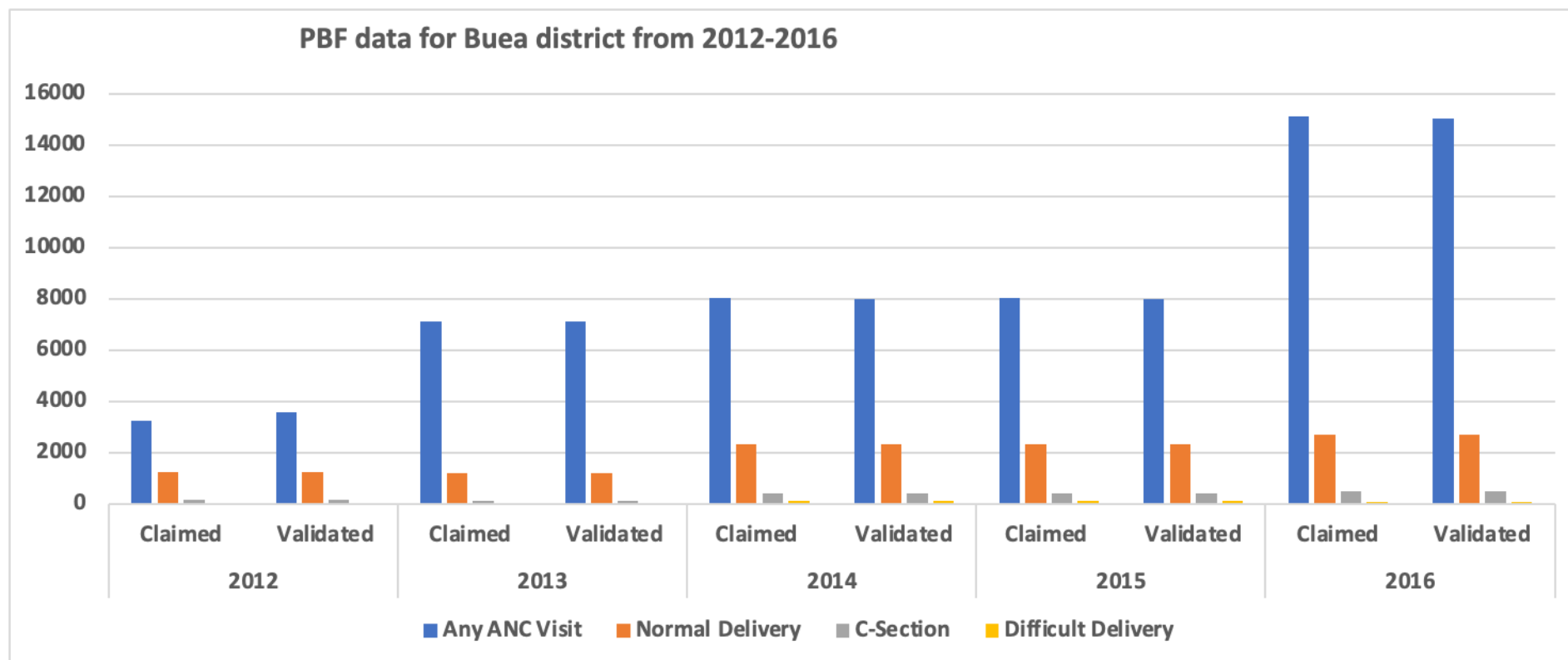


Figure 6.8. PBF data, Limbe district, 2012–2016

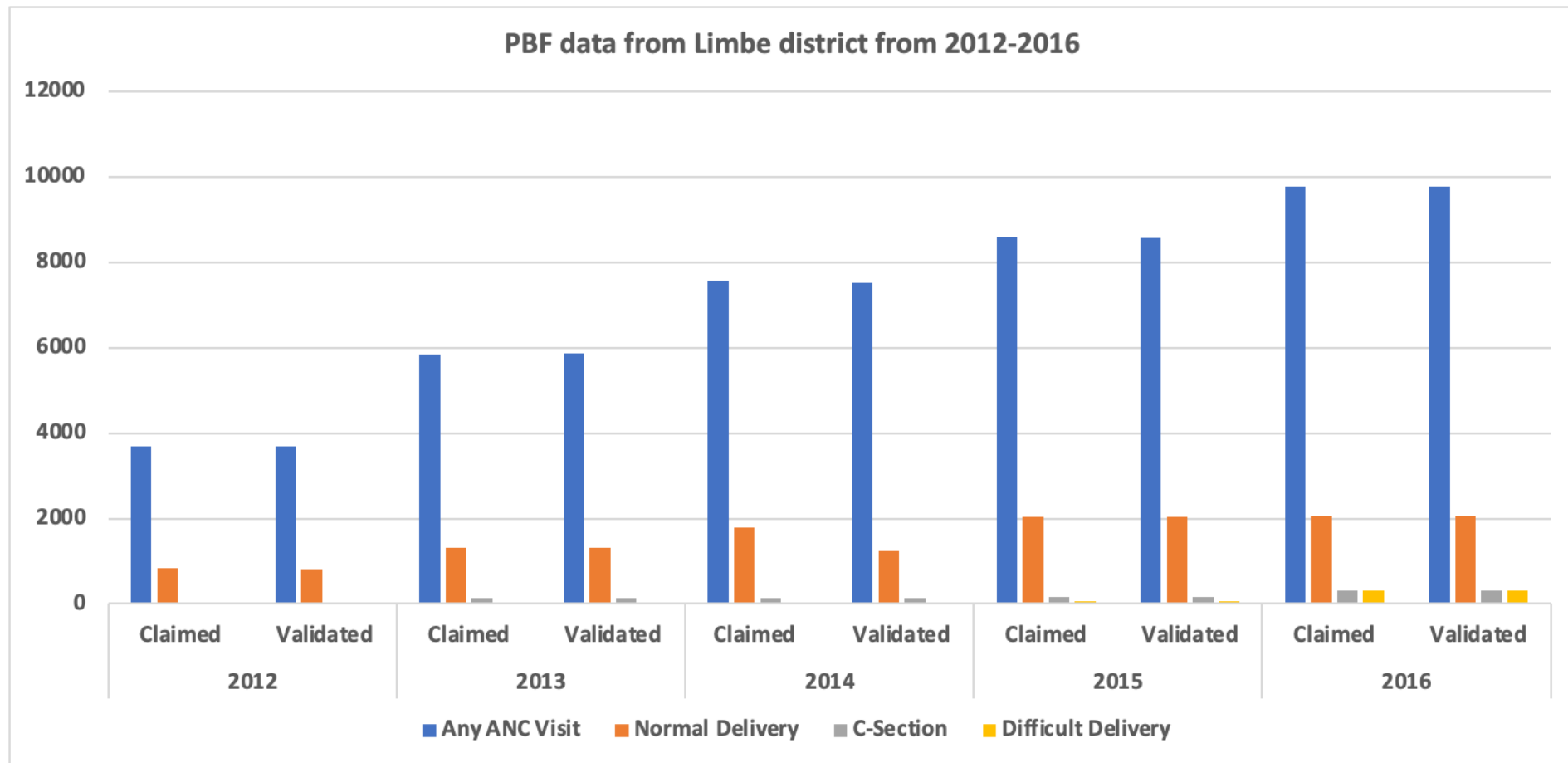


Figure 6.9. Record keeping of maternity registers and files on skilled birth deliveries at public health facility, Buea district



Photo credit: Miriam

Chapter 7
Examining the Implementation of the Performance-Based Financing Equity Elements in
Improving Access to and Utilization of Maternal Health Services in Cameroon: A
Qualitative Study

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1. Preface

This chapter reports on the third objective of my dissertation, which was to define and describe the implementation of the PBF equity elements at the health facility and community. This chapter uses a grounded theory approach to examine this component. Findings from previous chapters informed aspects of the data collection, interpretation, and development of the framework. I conducted interviews with PBF team, health care providers, and community members and focus group discussions with community health workers. I transcribed the interviews with the help of research assistants, performed the data analysis with a second coder (CA). I led the interpretation and writing. Drs Yaya and Little supervised the design and methodology and critically revised the manuscript. Dr. Adams provided content and critically revised the manuscript. Drs Deonandan and Pongou critically revised the manuscript. All authors review and approve of the final version.

Status of the Manuscript: Published, International Journal of Environmental Research and Public Health (IJERPH)

Ethics Approval: Required and Approved

2. Abstract

Background: Performance-based financing (PBF) – a supply-side strategy that incentivizes health providers based on predefined quality and quantity criteria – introduced an innovative approach to reaching the poor by means of using the PBF equity elements. These PBF equity elements include paying providers more to reach out to poor women, selecting services used by the poor, subsidizing user fees to reduce out-of-pocket expenses, adding complementary demand side intervention. There is significant research gap on how the equity elements are define and implemented across context. This study aims to understand i) how health facilities define and classify the poor and vulnerable in the context of PBF, ii) how the equity strategies are implemented at the community and facility levels, iii) and the potential impact on access and use of maternal health services at the facility level and the challenges in the implementation process

Method: We used key informant interviews and focus group discussions based on a grounded theory approach to gain an understanding of the social processes and experiences. Data were collected from three districts in the Southwest region of Cameroon from April 2021 to August 2021. Data were transcribed and analyze using MaxQDA. Thematic analysis was used to analyze data.

Results: Key informant interviews and focus groups were conducted with 79 participants, including 28 health professionals and service administrators, 27 pregnant women and 24 community health workers in three districts. Health facilities employed various subjective approaches to assess and define poor and vulnerable persons. Home visits was reported to have an impact in reaching the poor and vulnerable(PAV) to improve access to maternal services. Meanwhile, delay in payment of PBF incentives was reported to be the main challenge which had a negative relationship with the consistent provision of care to the poor and vulnerable especially in private health facilities.

Conclusion: The theory generated from our findings suggest that the impact of the PBF equity elements specific to maternal health depends on i) shared understanding to the definition of PAV among different stakeholders, including providers and users, as well as how the PAV is operationalized (structure) and ii) the appropriate and timely payment of incentives to health facilities and health providers

3. Introduction

Performance-based financing (PBF) – a supply-side strategy that incentivizes health providers based on predefined quality and quantity criteria – introduced an innovative approach to reaching the poor known as the PBF equity instruments [1-3]. These PBF equity elements include the following: i) paying providers more to reach out to poor women, ii) selecting services used by the poor, iii) subsidizing user fees to reduce out-of-pocket expenses, iv) adding complementary demand interventions, and v) using community health workers to address information and social barriers [1-3] (Table 7.1). The intention is to facilitate the allocation of more resources where people have more needs: a health facility in a rural or poor area receives more resources than those in urban or more affluent areas [1-3]. More resources are allocated where people are poor, and a health facility can reduce the cost of services but still earn more money from PBF equity (incentives) to cover the cost of services [1-3].

In Cameroon, based on information gathered from the PBF offices- for some curative services where health facilities require out-of-pocket payments, there is an indicator to provide free or subsidized services to those considered poor. This equity elements aims to ensure that the health facility reaches out to the poor and provides services; however, regarding identifying and selecting poor people, the health facility and community are left to decide how to identify those who should benefit from the services under the category of poor and vulnerable. To implement this component, health facilities and the community can employ the following criteria: i) proxy means testing – a method by which each household is scored based on one or more of a small number of easily observable characteristics or assets; ii) community targeting, where village committees or groups within the village decide who should be considered poor within a health catchment area; and iii) identifying people circumstantially vulnerable as a result of road accidents or internally displaced persons [1-2].

In Cameroon, again based on information gathered from the PBF office, these equity elements are operated at regional, health facility, and individual levels. Regional equity incentives are aimed at

reducing poverty differences between regions. For example, the northern regions, are considered the most vulnerable, so they are allocated a higher equity incentive. Within the regions, there are also district-level gaps, and the distinctions regarding equity incentives are based on the district's characteristics and distance to the district hospital. At the individual level, people are classified according to their poverty level; as poor (that is, extremely poor) or not poor.

According to information gathered from the PBF team; PBF signs contracts directly with health facilities based on a predefined equity expectation. Each health facility is assigned an equity category, based on accessibility, population density, poverty level and distance, from the main health facility. The equity category is ranked from 1–5. Category 1 indicates access is difficult in all seasons, the population is very sparse, very poor and far from the district hospital. Category 5 indicates facility is easily accessible in all seasons, serves a higher populated area, with an affluent population that is closer to the district hospital (Appendix G). This equity category is used to calculate the equity scores and the incentives for each health facility based on predefined quantity criteria for each indicator.

At the individual level, an equity bonus is provided per service rendered within the list of indicators considered under the category poor and vulnerable (PAV), and the bonus varies as a function of the economic class in which the patient is classified. For example, PBF pays a greater bonus (4×) for a skilled birth delivery by qualified staff if the woman is defined as PAV than if she is classified as non-poor. This aims to ensure the health facility will not create financial inaccessibility for the person. This applies to most of the indicators, including vaccination, normal deliveries, antenatal care visits, minor surgeries, major surgeries, and C-sections.

Ultimately, the above-listed equity elements are aimed to improve access to maternal and childcare and to stimulate demand by providing incentives to health providers, reduce out-of-pocket expenses and information barriers to expand coverage for the PAV, and thus increase access and use of maternal health services to the poor and vulnerable [1-2]. Therefore, this study focused on health facility and individual levels because the equity elements are operationalized at the facility level, and the trickle-down effect is expected to impact individuals considered PAV. It should be noted that PBF is

implemented at all health facilities be it primary, secondary, or tertiary care facility, however, in the context of this study, there are only primary and secondary care facilities within the study region. The study examined the above equity elements with a focus on antenatal care (ANC), skilled birth delivery, and family planning.

Table 7.1. PBF equity design elements and anticipated effect on equity

PBF equity design elements	Effect on equity and financial protection
1. Choose services that are underused by the Poor	Increased use of selected services by the poor.
2. Pay providers more for reaching a poor person than a non-poor person	Increased use by the poor more than the non-poor
3. Pay providers more for services delivered in poor areas	Increased use by people in poor areas more than by people in non-poor areas; more resources pushed to poor areas
4. Subsidize user fees	Reduce out-of-pocket cost, thus enhancing financial protection and increasing use of services
5. Incentivize community health workers	Overcoming information and social barriers for the poor
6. Add complementary demand side incentives	Overcoming financial barriers (such as transportation cost and related expenses)

Source: Fritsche et al., 2014[1].

Previous studies have reported a lack of evidence that PBF influences equity [1,4]. In Rwanda, PBF implementation indicates a pro-rich policy but did not include an equity-based strategy to increase the use of ANC and skilled birth delivery [6,7]. However, in Tanzania, PBF implementation was found to be a pro-poor policy [8]. Our systematic review findings on PBF induced effect on out-of-pocket expenses to improve access to antenatal care and skilled birth delivery (chapter 3) indicates that some studies used data from demographic and health surveys and quantified poorness using the household characteristics and asset index [10]. This may differ with the way PBF defines and categorizes poor [10]. Other studies used impact evaluation data (most of which did not assess the PBF effect on equity) and quantified poorness using the household hold characteristics and asset index.[10] However, one study from Burkina Faso reported this as a potential limitation in that the criteria used in defining poor in the PBF differed from the criteria used in the study [9,10]. Thus, our systematic review findings point to the

existing call for research in understanding how the PBF equity elements are defined and implemented in various contexts [1,4,5]. The systematic review also reported that studies did not define poor according to the PBF criteria, which may potentially lead to missed reporting or missed classification thereby putting the equity dimension of this initiative to question [10]. This implies, from a broader perspective, the concept of poor and vulnerable has not been well defined, not only within the PBF equity dimension, but in the context of equity in maternal health services.

Based on current literature, there is a significant research gap regarding how the PBF equity instrument is defined and implemented in various settings and contexts [4]. Given that Cameroon adopted PBF as one of the national health financing strategies towards achieving universal health coverage, it is important to investigate how PBF equity elements are defined and implemented. Moreover, the PBF equity elements is a new strategy to reach the poor in a system such as that in Cameroon, where few or no services target the poor to improve access to maternal health services. This study aimed to close this research gap by exploring how the PBF equity elements are defined and implemented at the health facility and individual levels in Cameroon. Therefore, the study examined how the PBF equity elements are defined and implemented at the health facility and community levels. The potential implications in improving access and use of maternal services and the challenges in the implementation process are considered. The findings from the systematic review and the earlier chapters (4 & 5) are used to inform some aspects of data collection and the framework generated in this chapter and the strategies for implementing PBF equity elements in Cameroon to guide policy and future research in this area.

4. Methods

4.1 Theoretical Framework and Study Design

The study is a qualitative exploratory cross-sectional study that employs a grounded theory approach to gain an understanding of the social processes and experiences regarding i) how health facilities define and classify PAV, ii) how the PAV classification is implemented at the community and facility level, iii) the

challenges for the health facility during the implementation process, and iv) the potential impact on access and use of maternal health services at the facility. Grounded theory focuses on social meaning and action and is usually employed in qualitative methods to study aspects of social and individual interactions, especially when a phenomenon has not been well-studied [11-14]. It enables the exploration of experiences from multiple perspectives to inform the data [11-14]. The goal was to identify the key elements and actors in implementing the PBF equity strategy and categorize the relationships of the elements and develop a theory on the process that influences the outcome of the PBF equity elements in the context of maternal health services in Cameroon.

This study employed Charmaz's constructivist grounded theory approach which presumes researchers as co-producers of knowledge and not mere observers of the social processes [21,23]. It assumes that theories and meaning derived from data are socially constructed, influenced also by the researcher's interaction with the data as well as with their study participants. We yet remain with the principal that our interpretation remains grounded in the data taking fully into account of the context in which such data were collected [21,23].

The first part of the study assessed the equity elements using an equity lens PROGRESS [15] (table 7.4) to describe how equity was considered in the design and how it was applied in the context, and this is presented in Table 7.5. The second aspect of the study examines the implementation processes, challenges, and gaps, and presents a framework grounded from participants own words. The third part of the paper combined the research findings from previous chapters and the study findings to inform the PBF equity elements and strategies in the context of antenatal care and skilled birth delivery in Cameroon.

4.2 Context and Settings

Cameroon is one of the six countries that make up the Central African Region, with a population estimate of 26 million inhabitants in 2020[16]. It has a decentralized health system with a pyramidal structure

comprising operational (district), regional, and central levels. Cameroon finances health care mainly through out-of-pocket (OOP) expenditure [16]. Women comprise approximately 50% of the population, and life expectancy at birth was 59 years in 2021 [16-18]. Health is delivered in both private and public sectors, and PBF is implemented in all sectors. The private sector comprises for-profit and confessional health facilities. Confessional health facilities are also called faith-based facilities or mission health facilities (these include Catholic, Presbyterian, and Baptist). This study was conducted in three districts (Buea, Limbe, and Tiko) in the Southwest region of Cameroon, in which there has been ongoing armed conflict since 2017.

4.3 Sampling

Sampling techniques in grounded theory can begin with individuals in the study area who are informed and could offer a rich source of data [20]. Grounded theory involves purposive and theoretical sampling [20,21]. Determining the sample size in qualitative studies is not straightforward [22-25]. Authors have proposed different sample size guidance [22-25]. For grounded theory, Creswell [1998, p.64] proposed a sample size of 20–30 participants, while Morse [1994, p.225] proposed 30–50 participants, with no justifying evidence for the above-mentioned numbers [22-25]. However, other factors influence the final sample size, including the study objectives, study design, population characteristics, data analysis approach, and availability of resources, such as budget and time [12,24]. Given that sampling in a qualitative study focuses mainly on the quality and meaning of the data and not necessarily the number of participants [22-25], saturation is the best guide to determine the sample size for purposive sampling [22-25].

There appears to be lack of agreement as to how saturation is achieved [12,13]. Some authors have distinguished two types of saturation: code saturation and meaning saturation [13]. They defined code saturation as “the point when no additional issues are identified, and the codebook begins to stabilize” [pg.594]. However, “meaning saturation is the point when there is a full understanding of the issues, and when no further dimensions, nuances, or insights of issues can be found” [p.594]. They listed six parameters influencing saturation (purpose of study, study population, sampling strategy, data quality,

code types, and codebook) [13]. This study assessed data saturation, which included documenting the steps in developing the themes, determining the number of themes generated by several interviews, and identifying the code frequency and hierarchy [13,22]. Purposive sampling was used to identify key informants for the interviews, such as health providers and PBF administrators, and theoretical sampling was used to identify women for the focus group discussions (FGDs).

All the health facilities in each district were eligible for the interview until saturation was reached. For each district, health facilities were grouped according to sector. The number of skilled birth deliveries in 2020 was used to rank health facilities (Appendix F). The first five most used health facilities for skilled birth delivery and the five least used health facilities were sampled for key informant interviews across sectors. This process continued until saturation was reached. The sampling frame ensured facilities with equity categories of 5 and 1 were included.

Theoretical sampling in this study was based on data that were obtained during concurrent interviews and was used to identify participants to be invited for the FGDs. We sampled a group of women considered as PAV for FGDs. Based on themes generated from the interviews with the PBF administrators, we sampled another group of women considered non-PAV (NPAV) for an FGD and later sampled another group, PBF verifiers for interviews. During FGDs with community health workers and the interviews with clinical verifiers and health facility administrators, two other actors involved in the process were identified, namely “head of quarter” (appointed local leader for a specific health area) and community verifiers. This led to interviews with quarter heads and community verifiers. In addition to the interview process, a PBF validation meeting was scheduled during this period, and this was intended to gain additional insight on the challenges faced by health facilities in the verification and validation process of PAV. Subsequently, we accompanied a PBF verifier to the field to observe the verification and validation of the indicators related to the PAV. Finally, we interviewed district regulators as a follow up based on data gathered during the interviews with PBF coordinators.

4.4 Research Participants, Data Collection, and Instruments

Interviews were conducted with health facility administrators, PBF administrators, health care providers, and district medical officers. FGDs were conducted with pregnant women and community health workers. An administrator for each eligible health facility responsible for assessing the PAV was sampled for interview. The initial samples were interviews with health providers and PBF stakeholders and focus group discussions with community health workers and women considered as PAV. In order to gain a comparison of the definition of poor and vulnerable by the various actors identified from the initial codes, and the experiences in the implementation process of the equity elements, the decision to conduct FGD with non-PAV, and interviews with district regulators, quarter heads, and the verifiers alongside observation of the verification process was made as part of utilizing theoretical sampling. The use of non-participant observation further explored the emerging categories and to understand and capture some aspects of the social processes and the interaction amongst health providers and the PBF verifiers and gain further insights into participants responses. Purposive sampling of providers from the sampling frame was used to initially recruit participants with the help of research assistants and health administrators in the research setting. The snowballing technique was used to further sample key informants and health care providers within the district. An administrator for each eligible health facility responsible for assessing the PAV was sampled for interview.

Providers and administrators (including a PBF team) were interviewed face-to-face at their offices. For CHWs, pregnant women, and community verifiers, a preferred location and time were arranged at their convenience. Considering that theoretical sampling is driven by concepts or categories [21,23,24], we did not have a fixed number of participants to sample. This is consistent with grounded theory principles, assuming that saturation is reached when participants are interviewed at different stages as the theme emerges; this is compared with subsequent data collection until there is no new information regarding the data being collected [12,13,22]. The interview guide was pilot tested with six potential informants not selected for the study. They verbally examined the questions with the investigator, providing feedback on readability, applicability, and understanding. Feedback-related minor changes

were made by the investigator to ensure the participants understood the subject matter and the questions could capture the data of interest to the study (Appendix D).

The open-ended questions for interviews [21, 23] were used to enable a broader discussion, especially as PBF is a newly implemented reform and little has been documented about the PBF equity strategy. The purpose of the study was discussed with participants and participants were prompted as needed to elicit additional information. All interviews started with a warmup question to allow a comfortable environment for the participant, followed by general and specific questions and, finally, the conclusion [23]. Warmup questions for providers started with, for example, “Tell me about your health facility and your role in the health facility.” For women, they included, “Tell me about your last pregnancy and where you sort care.” Intermediate questions [21, 23] for providers included, “Could you please tell me about your experiences with your health facility under the PBF?” and for women, “Can you tell me about your experiences with consultation fees for antenatal clinic services?” These were followed by probing regarding specific, ANC, skilled birth delivery, and related costs, followed by questions on quality of care for the same services and probing to compare with previous pregnancies (Appendix D). Specific questions were more focused, especially following questions such as, “Can you explain to me what you mean by or what you think about cost, care, for example, for ANC with a previous baby and a recent baby?” For providers, probing focused on the equity elements for the PAV, specific questions for providers related to how they defined and categorized the PAV, including challenges and facilitators, and exploring specific questions concerning the context. Closing questions [23] summarized and allowed participants to add information not covered during the interview process [23], such as “Is there anything that you would like to add or recommend to the PBF or suggest changes you would like to see in the implementation process?” The closing question helped the interviewer explore the participants’ experiences in more depth. Questions for PBF managers resembled those for providers, with minimal adjustment depending on the individual role. However, at the regulatory level, discussions were informal with specific questions concerning quality control and facility accreditation, such as the facility not

meeting quality standards, strategies in place, or addressing challenges discussed, possible regulatory measures, and the potential for sustainability.

Field notes were collected throughout the data collection process to record relevant nonverbal considerations or actions, such as the tone, mood, and coherence of respondents. Interviews lasted 30–45 minutes and each FGD lasted for up to 1.5 hours. No relationship was established between the interviewer and participant before the start of the interview, and the study purpose was explained to the participants before the interview, followed by informed consent, which was read to participants. Interviews were conducted face-to-face and transcribed with the help of research assistants. Demographic data were collected on age, marital status, and educational attainment. All interviews were recorded, and participants were informed and provided consent before recording. Interviews were conducted by the lead investigator (MN) using MaxApp [28]. Interviews were conducted using the local dialect, “pidgin English,” except those with health providers and managers, which were conducted in English. The lead investigator is familiar with the local spoken language, so no translator was required. Interviews were conducted from April to August 2021, and member checking and validation were conducted in July 2022.

4.5 Data Analysis

Data analysis in grounded theory proceeds simultaneously with data collection [21-25]. In this light, the constant comparative method was used as the researcher compared data during the collection process. This helps produce a conceptual understanding to better explain the processes, experiences, and understanding of the PBF equity elements and implementation approaches and challenges [23]. The interviews were transcribed and exported into, the MaxQDA software [28]. In line with Charmaz’s approach for data analysis, we used three stages of coding - initial, focused, and theoretical [23]. Initial codes were developed using free codes and the in-vivo coding within MaxQDA [28], which allows line-by-line coding using the participants’ own words. Focused coding involved grouping the initial codes into categories and conceptualizing the process (Table 3). This process involves constant comparison and the use of memos in categorizing the groups. The initial codes were developed using free codes and the “in-

vivo” coding feature within MaxQDA [28], which allows line-by-line coding using the participants’ own words. Becoming familiar with the data involved reading and rereading transcripts, followed by sorting, coding, and constant comparison. The second stage was focused coding, which identified relevant and dominant codes and determined how these codes related to codes that were not dominant; categories were developed to test with the existing and new data to determine whether it reflected the participants’ views. Constant comparison at all levels, from the initial coding stage to theoretical sampling, was used to ensure the codes developed represented the coded information and confirm the codes and categories reflecting the data [21-25]. Finally, the data were segmented into meaningful data and the final codes created using the most important content grouped into categories [23]. The notes were grouped into a coding scheme to create subcategories. These subcategories were compared, contrasted, and revised by SY and JL and later subcategories with similar content, trends, and understanding were merged to produce main categories. Relevant or dominant codes were selected, and categories were generated by grouping the remaining codes around the dominant codes. Dominant codes were identified by considering the number of times or frequencies of specific codes, the number of times they were applied to the data, and the types of participants linked to the code. Finally, we narrowed all the main categories and developed core categories and theoretical coding was then used to represent participants’ experiences in implementing the PBF equity elements [23].

Two independent coders, MN and CA independently coded the data using various themes to assess the inter-rater reliability and trustworthiness of the study. The results were exported as codebooks and developed to reflect the summary synthesis of the discussion. Inter-coder reliability was discussed between the two coders for different and similar interpretations to enrich and fine-tune the analyses and ultimately converge them into a shared interpretation of the data. Saturation for grounded theory was reached by returning to the participants to compare the data collected until the new data indicated no new information.

Codes were later exported as codebooks and coded segments. The codebooks and coded segments facilitated the report preparation. Comparisons of the data within and between transcripts identified

potential relationships between categories and subcategories. For example, data were triangulated across different stakeholders interviewed to compare and capture experiences and to understand the interaction between actors in the process of identifying and providing services to the PAV in implementing the PBF equity strategies. In this theoretical sensitivity process, developed categories and relationships were iteratively refined following the conclusions of FGDs and analysis of FGD transcripts. The main categories were refined, and the relationships between main categories using insights from theoretical memos were used to expand and compile additional information about the data to help explain the results.

4.6 Trustworthiness

The trustworthiness of qualitative research is important to ensure that the study is rigorous to produce findings capable of impacting policy or practice [29,30]. For confirmability, the decisions made in the research process, from the research objectives to the interpretation of findings, are thoroughly described [29]. Feedback was received from co-authors SY, JL, and RG on the research objectives and questions. Additional feedback was received from SY and JL on the data analysis and reporting and from SY, JL and others acknowledged in the paper on interpreting the findings. This was vital for establishing dependability and credibility in the findings, as they provided valuable assessments of factual errors and competing interpretations in the manuscript. This study employed various methods of data triangulation as it involved the collection of data from women; providers; health facility administrators in public, private and confessionnal health facilities; PBF administrators; and regulators. These multiple data sources helped produce greater depths and breadths of understanding of the study findings [29,30]. The study also had method triangulation using both key informant interviews and FGD to collect data. Member checking was carried out from June-July 2022 by asking selected key informants based on the breadth and depth of the data to assess the data interpretation and reflect on what they expressed to the researcher. There was no major change to the data interpretation. This study has met the following quality conditions for grounded theory: iterative process, theoretical sampling, theoretical sensitivity, coding and memoing, constant comparisons, and theoretical saturation. Constant comparisons and theoretical saturation helped ensure that the results represented and explained the data [29,30].

4.7 Ethics

The Bruyère Research Institute at the University of Ottawa approved the study (# M16-18-057), and administrative clearance was obtained from the Faculty of Science, University of Ottawa (#H-02-19-2829). In Cameroon, we obtained ethical approval from the University of Buea Faculty of Health Sciences (Ref 2020/1342-02/UB/SG/IRB/FHS) and administrative clearance from the regional delegation of public health in the southwest region (Ref R11 MINSANTE/SWR/RDPH/PS864/715). We obtained informed consent from all participants who agreed to participate.

5. Results

Participants were interviewed across 25 health facilities in the three districts (six for-profit, three confessional, two para-public, and 14 public). A total of 28 participants were interviewed (see Table 7.2). Nine FGDs were conducted, three FGDs per district (within each district, one comprised CHW, one PAV, and one NPAV; see Tables 7.3 & 7.4). A total of 51 participants in the FGDs (27 pregnant women, 24 community health workers). The age range for women was 21–41 and for CHW 26-49. Equity scores for the health facilities ranged from 20 to 30. With the ongoing crisis, the definition of PAV extended to internally displaced people, and the equity score percentage was increased. There were approximately 39 maternal health indicators on PBF list, most of which had options for PAV.

Table 7.2 Characteristics of health providers and administrators for key informant interviews

	Tiko	Limbe	Buea
Health care providers			
Nurses	2	1	2
Midwives	1	0	2
Doctors	2	2	0
Administrators including regulators and PBF managers	2	2	3
Quarter heads	1	1	2
PBF verifiers	0	1	2
PBF community verifiers	1	0	1
Total	9	7	12

Table 7.3 demographic characteristics of respondents, women’s focus group, Buea, Tiko, and Limbe districts

Participants	Age	Level of education	Marital status	Household monthly Income	Employment status	Equity status	District
Code A	26	Primary	Single	<30000	Not working	PAV	Buea
Code B	29	Primary	Married	<30000	Not working	PAV	Buea
Code C	35	Secondary	Married	-	Housewife	PAV	Buea
Code D	35	Secondary	Married	-	Housewife	PAV	Buea
Code E	31	Secondary	Married	<30000	Not working	PAV	Buea
Code F	39	Primary	Married	<30000	Not working	PAV	Buea
Code G	38	Secondary	Married	-	Employed	NPAV	Buea
Code H	27	Secondary	Married	60001-900000	Employed	NPAV	Buea
Code I	26	University	Married	60001-900000	Employed	NPAV	Buea
Code J	28	University	Married	60001-900000	Employed	NPAV	Buea
Code K	33	University	Married	120000-150000	Housewife	NPAV	Buea
Participants							
Code A	33	Primary	Married	-	Not working	PAV	Tiko
Code B	29	Primary	Married	<30000	-	PAV	Tiko
Code C	26	Secondary	Single	<30000	Not working	PAV	Tiko
Code D	28	Secondary	Married	-	Not working	PAV	Tiko
Code E	21	Secondary	Single	<30000	Not working	NPAV	Tiko
Code F	33	High School	Married	30000-60000	Not working	NPAV	Tiko
Code G	26	Secondary	Divorced	120000-150000	Self employed	NPAV	Tiko
Code H	26	High School	Married	120000-150000	Employed	NPAV	Tiko
Participants							
Code A	38	Primary	Married	<30000	Not working	PAV	Limbe
Code B	37	Primary	Divorced	<30000	Not working	PAV	Limbe
Code C	41	No education	Widowed	<30000	Not working	PAV	Limbe
Code D	36	Secondary	Single	<30000	Not working	PAV	Limbe
Code E	36	Secondary	Single	<30000	Not working	NPAV	Limbe
Code F	38	Primary	Married	30000-60000	Self employed	NPAV	Limbe
Code G	41	Secondary	Married	-		NPAV	Limbe
Code H	39	Primary	Married	-		NPAV	Limbe

Table 7.4. Demographic characteristics of respondents, CHW focus group, Buea, Tiko and Limbe districts

Participants	Age	Level of education	Marital status	Employment status	District
CHW1 Male	39	-	N/A	Employed	Buea
CHW2 Male	28	-	N/A	Employed	Buea
CHW3 Woman	38	-	N/A	Not working	Buea
CHW4 Woman	39	-	N/A	Employed	Buea
CHW5 Woman	27	-	N/A	Not working	Buea
CHW6 Woman	34	-	N/A	Employed	Buea
CHW7 Woman	32	-	N/A	Not working	Buea
Participants					
CHW1Male	33	University	N/A	Employed	Tiko
CHW2Male	41	High School	N/A	Employed	Tiko
CHW3 Woman	42	High School	N/A	Farming	Tiko
CHW4 Woman	43	Primary	N/A	Employed	Tiko
CHW5 Woman	39	Secondary	N/A	Employed	Tiko
CHW6 Woman	33	Secondary	N/A	Not working	Tiko
CHW7 Woman	29	Secondary	N/A	Employed	Tiko
CHW8 Woman	40	Secondary	N/A	Not working	Tiko
CHW9 Woman	26	University	N/A	Student	Tiko
CHW10 Woman	28	Primary	N/A	Not working	Tiko
Participants					
CHW1 Male	28	Secondary	Married	Employed	Limbe
CHW2 Male	43	Secondary	Single	Self employed	Limbe
CHW3 Male	49	Primary	Married	Employed	Limbe
CHW4 Woman	28	Secondary	Married	Not working	Limbe
CHW5 Woman	38	Secondary	Single	Employed	Limbe
CHW6 Woman	42	Secondary	Single	Farming	Limbe
CHW7 Woman	47	Secondary	Single	Farming	Limbe

Not working implies they do not have a contract with a health facility under the PBF program

5.1 Applying an Equity Lens in Defining the Poor and Vulnerable in the Context of the PBF Equity Strategy

The use of the PROGRESS (place, religion, occupation, gender, race, education, social status, sex) plus tool has been widely recommended as a reminder of policy on equity considerations [15]. When applied to the PBF equity design elements indicates that some of the variables were considered in the designing the equity elements (table 7.5). We observed that both individual and contextual factors are considered in the PBF equity design elements. However, in the implementation phase, health facilities selectively applied some of the items as applicable to their context and convenience. This means that, depending on the state of the individual upon presentation at the health facility, they have an equal probability of being categorized as PAV irrespective of their actual household income quintile, occupation or education. These criteria are subjective as there are no specific means for an objective assessment; this therefore depends on the discretion of the health care providers and their relationship with the patient. Table 7.5 below describes the actors involved and application of each equity item within the context.

Table 7.5. Applying the PROGRESS lens by O’Neil et al. to the PBF design equity elements and considerations for poor and vulnerable

Using the PROGRESS lens by O’Neil et al. on the PBF design equity elements and considerations for poor and vulnerable.

PROGRESS Elements [17]	Explanation in PBF context	Actors in the identification/validation process of PAV	Level of assessment At Health Facility	Individual/Community and contextual factors
Regional location of districts and place of residence	Consideration of regional and geographic barriers and population density in the allocation of equity bonuses for health facilities and districts which also has a potential trickle-down effect at the individual level especially for the poor and vulnerable (PAV)	Community health workers (CHW), quarters heads and General Supervisor at health facility	Health facility or social service department assess referred patient to qualify as PAV	CHW explore and identify potential PAV women from the health areas and validate with quarter heads for referral to health facility
Cultural sensitivity	Consideration of certain cultural groups of women not using health facility and language	Traditional birth attendants & CHW refer women to health facilities	Individual and health facility	Traditional birth attendants are encouraged to refer women to the health facility for skilled birth delivery
Employment characteristics and status	Consideration of the nature of the job and employment status of individuals	General supervisor of health facility or social service department /CHW	Health facility or social service department assess occupation status in the validation process of poor and vulnerable	CHW explore potential occupation status during identification and referral process

Gender group	Gender consideration especially for women	Health facilities/CHW	Health facility assess pregnant women based on marital status and consideration of HIV status	Women who are single or widowed are potential beneficiaries in the referral process of CHW to health facility as a potential poor and vulnerable
Religious background	All confessional health sectors are considered in the context of PBF for poor and vulnerable and all individual religious background	Not applicable	Not applicable	Not applicable
Level of education	Consideration of educational level of individuals in identifying poor and vulnerable at the health facility	General supervisor of health facility or social service department /CHW	Health facility conduct assessment of educational status during validation process	CHW explore educational status in the identification and referral process
Economic and income status	Consideration of income levels and social status of individuals for consideration as poor and vulnerable	General supervisor of health facility or social service department /CHW	Health facility or social service department conduct assessment during validation process	CHW explore income status in the process of identification and referral based on conditions of the household and understanding of the household within the health area and validates with quarter head for referral
Social network and family	Consideration of social network or family relatives, friends or neighbours of goodwill who can support poor and vulnerable individuals)	General supervisor of health facility or social service department /CHW	Health facility or social service department assess potential family relatives who can pay for services in the validation process	CHW explore potential social networks and family relation who can support payment and validates with quarter head for referral

Source: Adapted from O'Neil et al., 2013[17]. The first column is based on O'Neil et al's PROGRESS lens elements and the remaining four columns is based on the authors' application in the context.

Themes generated from participants responses

The main themes generated in the study are presented in Table 7.6 below constituted the relationship in the framework illustrated in Figure 1. The relationship between dominant categories reported in the implementation process of the PBF equity elements and their definition and perspective of poor and vulnerable constituted the framework in understanding the implementation process of the PBF equity elements and potential impact on PAV. For example, delay in payment was a dominant category that emerged across all sectors and stakeholders and had a negative relationship with the provision of care to the PAV. This relationship provides meaningful understanding to the theory that has been developed and it is the original contribution of knowledge in this research. Thus, the theory generated from this study suggest that the impact of the PBF equity elements specific to maternal health depends on, i) shared understanding to the definition of PAV among different stakeholders, including providers and users, as well as how the PAV is operationalized (structure) and ii) the appropriate and timely payment of incentives to health facilities and health providers.

The results are presented as follows: the first part provides a description and interpretation of how PAV is defined based on the themes grounded from the data, and the processes involved in the identification and validation of PAV and the actors involved. The second part reports the challenges in the process and describes the relationship from the themes that constitutes the theoretical framework and supports the theory developed from this research.

Table 7.6. Themes generated from the data

Themes	Categories	Examples of Codes
Implementation		
1.Contextual definition of PAV	Poor and vulnerable by facility	Poor, no job, orphanage, accident, internally displaced persons
2. Identification of PAV	Challenges in differentiating PAV, NPAV status by actors	Referral, home visits, PAV referrals from CHW not validated by health facilities, pretend to be PAV, quarter heads' refusal to refer, quarter head's, attitude with CHW, health administrator's interrogation of PAV, poor documentation of PAV for validation
3.Type of health facility	Challenges Private, public, confessional	Limited finance to support PAV, delay in payment, risk of no payment, influx of patient
4. Verification/Validation process	Challenges by CHW, health administrators, verifiers	Wrong referral, poor documentation, disagreement on definition of variables
5. Structural/Management	Experiences Private facility, public, confessional	Referral for PAV, CHW, cost of services for PAV, delay in payment
6. Delay in payment	Equity bonus	Cannot support PAV, cannot pay staff
Other subcategories		
1. Poor documentation of PAV	Error margin, loss of incentive	Incomplete data, disagreement on definition of variables
2. Meeting threshold of 10%	Challenges Private, public, confessional	Unpaid consultations, delay in payment, poor documentation
3.Quality of care	Private, public, confessional	Experiences with delay in payment, provision of care, volume of patients

5.2 Definition and Classification of PAV by Health Facilities

Each facility presented a set of criteria for defining PAV. These criteria included occupation, marital status, inadequate finance to pay for services at the point of care, internally displaced status, disability (mainly physical), disease exposure status (mainly HIV status for women), place of residence (quarter), and poor family background, defined as the level of social network and lack of job or employment status (see Table 7.5). These factors are also similar with the characteristics of the PROGRESS framework [15]. Table 7.7 presents the reported criteria used by health facilities to identify and categorize PAV across sectors. The health facilities reported different ways of defining, identifying, and categorizing who was PAV within their community and at the point of care. However, some variables were common to all the facilities, such as internally displaced people (see Table 7.7 below).

Table 7.7. Reported criteria by health facilities in identifying poor and vulnerable

	Internally displaced persons	Physically handicapped persons	Inadequate finance to pay for services at point of consultation	HIV infected persons (especially women)	Employment/ Occupation (Very poor background, lack of job)	Marital status	Place of residence	Social network
Facility Type								
Public	X	X	X	X	X			x
Private for profit	X		X	X	X			x
Confessional	X	X	X	X	X	X	x	x
Para-Public	X		X	X	X	X	x	

Social network in this context referred mainly to family members, friends, neighbors

The themes that emerged from the definition of PAV are presented in Table. 7.8. Most participants reported aspects related to occupation. The household characteristics are used to explore observable items such as owning a television, and this relates to the proxy means testing. This was conducted more by community health workers as they were more engaged in the exploring stage and referral to the health facility. Vulnerability was mainly defined based on disease status; internally displaced people, given the ongoing conflict in this region; widowed status; and physical disability.

Health administrator, general supervisor and social service worker explains how they define and identify

PAV:

“Before now we identify the poor and vulnerable from the orphanages but with the current war we have a lot of internally displaced persons” (Health administrator, private facility Buea)

“Poor and vulnerable are those who cannot afford to pay their bills, disable, and not working” (GS, Confessional Tiko)

“We use various approaches to identify poor and vulnerable such as conduct psychosocial assessment to know if they can afford to pay the bills because some people will want to pretend to be poor” (Social service, Public)

“Those who are unable to work, physically disabled or are sick are considered vulnerable because vulnerability is circumstantial but to be poor can change” (GS, Public, Limbe)

Table 7.8. Defining poor and vulnerable; themes from respondents

Responses from participants in defining and categorising poor and vulnerable

Poor	Vulnerable
Income	Age
Household characteristics	Disability(physical)
Expenditures	Disease exposure/status e.g HIV
Social networks	Population group (internally displaced persons)
Occupation	Accident (for example road)
	Conflict setting

Given that this study was conducted in a conflict setting, most internally displaced people who used the health facilities for specific services could be classified as PAV at the health facility. However, in the context of PBF, a circumstantially vulnerable person could also be PAV, for example, due to an accident leaving the person vulnerable, irrespective of their income status. In such a situation, the individual is treated in the health facility as PAV. All health facilities are expected to classify the PAV in the register for specific maternal health services separately from the NPAV. This classification is further verified and

validated by the PBF verification and validation team before the assigned PBF incentives can be attributed to the indicator.

5.3 Actors in the Identification and Referral of PAV

The process is implemented through referral from CHW as assigned by health facilities or through the social service department as explained in health facilities that have social service workers. However, this is not limited to the above procedure as all patients can be considered a potential PAV at the point of care depending on how the patient present their situation upon making payments.

Health facilities work in collaboration with the CHWs and quarter heads because they know most of those who live in the community. With PBF, CHWs are becoming more active in some health facilities. CHWs are given a referral slip, which allows them to refer patients to the health facility, and each successful referral is an incentive. Health facilities conduct a quarterly meeting with the CHW, and they are instructed that if they identify that someone meets the conditions for PAV during the referral procedure and referral process, they must indicate this in the referral slip and ask the quarter head to endorse it. A general supervisor explains:

“We usually have meetings with these community health workers every three months and we brief them on who they are supposed to refer to the hospitals as PAV...during the briefing, we tell the community workers to also find out why that person is a pauper, because if they are not, they can lost the incentives” (GS, Limbe)

5.4 Steps in the Identification of PAV

Of the three approaches initial listed above to identify poor people from the PBF manual [1,3], the two most used approaches in this region were community-level targeting and identifying circumstantially vulnerable people by health facilities and social service workers.

5.4.1 Community-Level Targeting

Health facilities are expected to recruit community health workers in their health areas according to the health facility’s needs. Health facilities sign contracts with CHWs for referral and follow up during home visits, which are sometimes conducted together with nurses or during community random spot checks. Once a CHW identifies a potential PAV individual in the community, the CHW is expected to validate

this with the quarter head, who then endorses their signature, and the CHW refers the PAV person to the health facility for treatment. At the health facility, another validation process is conducted by the general supervisor or other administrator assigned to this task. At this phase, the General Supervisor or assigned administrator conducts another assessment of the patient to ensure they meet the criteria mostly based on the factors listed in Tables 7.7 & 7.8. Depending on the assessment outcome, the GS decides whether the patient will be considered as PAV and whether they qualify for free or subsidized services.

5.4.2 Health Facility

Besides referrals from a CHWs, health facilities also identify PAV as circumstantially vulnerable people—this may include road accidents, internally displaced people, and those with physical disabilities. This is at the discretion of the provider or health facility administrator based on the presentation of the patient at the point of care; it could also result from circumstantial factors such as inability to make payment; an accident, which does not necessarily relate to the level of income or employment; and other types of assessment conducted as listed above in table 7.8. Additionally, during consultation at the point of care, health providers may refer a patient to the GS for validation as PAV based on a combination of the factors listed above.

5.4.3 Social Service Workers

Regional social welfare services are run by the government before PBF to support poor patients who could not pay their bills; this was at a minimal scale and only at the regional health facilities. With the introduction of PAV, health facilities that initially had a designated person for this service use the same service to assess PAV individuals and then refer the patient to the GS for approval. Individuals from other government health facilities can be referred to the regional health facilities to benefit from this service; however, this was reported to be more theoretical than practical, given the limited resources. Nevertheless, with the introduction of PBF all health facilities are obliged to provide services for PAV with the assumption that this is a context that has more PAV and there is no way a facility would say that

they do not have PAV individual. This has helped to increase the number of patients benefitting from the services as reported by the social service department.

The social service team does not work with the CHWs. The team only identifies PAV people at the level of the health facility providing care, and they can follow up at home after treatment to ensure they adhere to treatment and provide psychosocial support when needed. As two of the social workers stated:

“We have our techniques and observation from your presentation and talking and some try to tell lies so we go further even to their homes to verify if they have a family member who can support their bills and we educate some on family responsibility” (Social service worker)

“With PBF the difference is that PBF has made us to be smart in identifying some of the PAV because before we had challenges with the administrator in identifying but with PBF we go further and we have the strength to explore and even go to the facility for example before if we have 5 paupers we will present to the administrator and they will only support like 2 but with PBF when we present 5 the administrator will cover all the five because PBF will pay part of the bill”.(Social service worker)

5.5 Actors in the Verification and Validation for PAV for the PBF Equity Incentives

During the verification process, the PBF verifier explained to us that since the inception of PBF in these districts, the PAV list was designated to quarter heads, but the PBF team realized that quarter heads were listing the names of their families and household members. This was changed, and PBF transferred the assignment to the health facilities for management committees to identify and validate the PAV. Each health facility has a management committee that provides a focal point for the community and contains a CHW and the GS of the facility. The chief of the center or any board management team member must endorse the PAV cases treated at each health facility for PBF verification. Any case not signed by the administrator (chief of center or committee board member) is not considered PAV or cannot be validated, which may result in an error margin and eventual cancellation of the indicator if the error margin exceeds 10%.

All facilities are expected to declare a PAV person for each indicator in the registers; otherwise, an explanation must be provided, or they may face sanctions, given that most people cannot pay bills in

Cameroon. It is not practical to report no PAV. Therefore, health facilities are compelled to report PAV cases for specific indicators.

The home visit register gives a reliable picture of the quarter and PAV; for each family visited, all the names of the family or household are listed. All home visits and quantities declared must be validated and justified before PBF buys, for example, if a home visit is on family planning and the registers indicate that more family planning services were bought and aligns with the timing of the home visits, or campaigns for community awareness. However, if vice versa, home visits are related to something else, or registers do not align with the issue, further justification is required for validation.

5.6 Challenges in the Identification and Validation of PAV

5.6.1 Health Providers' Challenges

Some GSs reported that some people pretend to be PAV, and during the assessment process, they later realize they can pay their bills. Some providers reported challenges with how CHWs identify the PAV and that some CHWs are not well-trained and assume everyone referred to the health facility is automatically considered PAV or will be given the services under that category. According to the provider, there are criteria that must be evaluated at the health facility at the point of care before confirming a PAV individual, and they also have quotas. An individual is not always given care under this category even if they are referred by a CHW. Referral by a CHW to a health facility under PAV does not necessarily imply that the individual will be considered PAV at the point of care by the facility. This poor understanding or communication between the facility and CHW was reported by both parties and sometimes caused friction.

5.6.2 Community Health Workers' Challenges

Some CHWs reported challenges when referring individuals, where these individuals did not meet the administrators on arriving at the health facility and became frustrated when they were not given the services. However, not all those referred by CHWs are considered PAV at the point of care. Some CHWs reported challenges in the referral; when they referred potential PAV candidates to health facilities, they

were not given the services, and this miscommunication on both sides sometimes resulted in conflict. As one of them stated:

“Management gives instructions to inform pregnant woman that haven't started antenatal to come for consultations, promising to offer them reduction in their bills., but these promises are not respected. The bills are the same, I haven't seen any differences in the reduction of amount with respect to the bills, because when you bring those woman and what they expect, it is not the same set up as earlier promised, they start blaming me why I didn't inform them before hand to prepare themselves before coming, instead telling them something else and coming here, they are telling them something else....(FGD;CHW Tiko)

Community health workers also reported challenges with quarter heads. CHWs reported times when the quarter head could not identify or know all the people living in that area; thus, regarding the PAV, when CHWs notice someone is sick, they approach the quarter head, explain the situation to him, and plead with him to identify whether the person can afford the bills before taking them to the health center. If the quarter head cannot do this, he must ask his assistant to help him perform that task. One of the CHW shared the following experience:

“Yes in my own quarter when you go to see the quarter head, the quarter head will tell us to go, because the health center doesn't see them as anything” (FGD;Buea CHW)

Interestingly, conflicting perspectives were offered by quarter heads. Some were unaware of the PAV referral process in their quarter and did not understand how the CHWs operated. Conversely, some quarter heads had different opinions, and some had not heard about PBF and the CHW referral system for the PAV. As one of the quarter heads stated:

“I have heard about CHW as they mention them sometimes during the meetings at the health facility, but I have not seen or worked with PBF or have community health workers come to me. The CHW don't come to me and we would like to work with them so we can identify paupers in the community” (quarter head Buea)

“I think PBF publicity aspect is very dormant, they haven't really mobilized people in a way that they could be aware that there's some help available. They could do it on the radio, but not everyone really listens to the radio. So I don't know if they could come to the community, meet up the various quarter heads so they could work together so as to show they are really out to provide help. Because as for now it's just a few of us who even know about PBF, so this shows their publicity is really slow”. (Quarter head Buea)

5.6.3 PBF Manager's Challenge

From the perspective of PBF managers, it was apparent that services were provided to people (considered PAV) once they were in the health facility, even if they did not have the finances to pay; however, this was not well-implemented or managed in certain health facilities, as expected. We further explored this aspect amongst providers, and a key relationship was identified between the delay in PBF equity bonus payment and the delivery of services to the PAV, which could impact access and the use of maternal services.

Concerns were expressed regarding poor management of the PAV by most facilities, as they did not meet the 10% threshold for equity services. This implied potential underuse of the services by the PAV, as expected, due to implementation challenges for some health facilities. Issues were reported regarding some facilities not meeting their maximum 10% threshold for PAV, yet these facilities had enormous unpaid bills by women who had delivered and could not explain why the unpaid bills were not treated as PAV given that the facility had not reached its maximum 10% threshold.

Questions were asked to determine what caused health facilities' inability to meet the threshold to manage the PAV effectively. These were answered by some health facilities.

“The thing is that their payments are not regular, you are expected to present a business plan, provide services to poor and vulnerable and pay staff, when the payment do not come on time you start asking if you are there to pay staff or to take care of the poor and vulnerable” (Provider; private facility).

5.7 The Role of the PBF Equity Strategy in Improving Access to and Utilization of

Antenatal Care and Skilled Birth Delivery

Despite the challenges reported by health care providers in the identification and validation process of PAV, some women considered as PAV expressed positive experiences with access to services, especially not being asked for payment before treatment, which helped reduce barriers to financial inaccessibility for them. Some expressed their experiences with the support they received from the health facility after delivery, which was not the case before PBF.

5.8 Home Visits

The use of home visits as introduced in the PBF program was reported as an important mechanism in reaching out to the PAV by all the actors involved. This was not a practice before PBF as reported by health facilities. Providers reported an influx of women in their clinics or health facilities due to the introduction of home visits. Providers saw PBF home visits as a mechanism helping increase access and use of services by the poor by breaking information and social barriers through using CHWs for home visits. During a home visit, a health facility team is accompanied by a CHW. They educate and sensitize households regarding specific health-related conditions, including women who avoid using the health services due to cost and prefer to stay at home. This approach, reported by providers, helps identify women who would otherwise be unable to access the services due to cost.

“With PBF we have the integrated outreach home visits that we do every month we have 18 communities, and we target each per month ...this activity is very good because with PBF there is money that you can pay the staff and CHW and the staff are willing to go for home visits and we are also evaluated by that services and beside the activity also create an impact in the community because some community does not know our facility and also an opportunity for us to advertise our activities when we go like that they get to know that public facilities are also cheaper and we also see the reality of the population and we see the state and feel sympathy for some... (Provider, Limbe &Buea)

we get to see the reality during home visits, I remember one time what we saw there I really felt pity we met three children from the same mother with serious wounds on very risky positions on their body and we felt so bad and we saw them being expose to potential infection and we had to invite the family to the health facility and treated them and follow up on their wounds until they got treated and this is because of the PBF support. Now the woman comes to the health facility for treatment.....Without PBF it will not have been possible at all because who will go out to the community without any motivation, no one will do that, the outreach and the home visits would not have been possible, the staff will not go out without motivation” (Provider, Limbe &Buea)

Community health workers also reported the importance of home visits but had a contrary view of how they were treated during them. They believed that without them, the nurses would be unable to conduct the home visits effectively as required by the PBF indicator because it is the CHWs who understand the community and the quarters, and providers acknowledged that without the CHWs, they would be unable to effectively implement the home visit. However, some CHWs expressed dissatisfaction regarding how they were paid for the home visits.

“last year home visit we were not being paid so we were paid only when we refer people and after that when they call I just told them I can't be taking a nurse for a home visit she is the only one that was being paid and me taking her to the houses is not being paid so I refuse working for the home visit but with this new contract they have agreed to pay me and I have decided to go for the home visit” (FGD:CHW, Tiko)

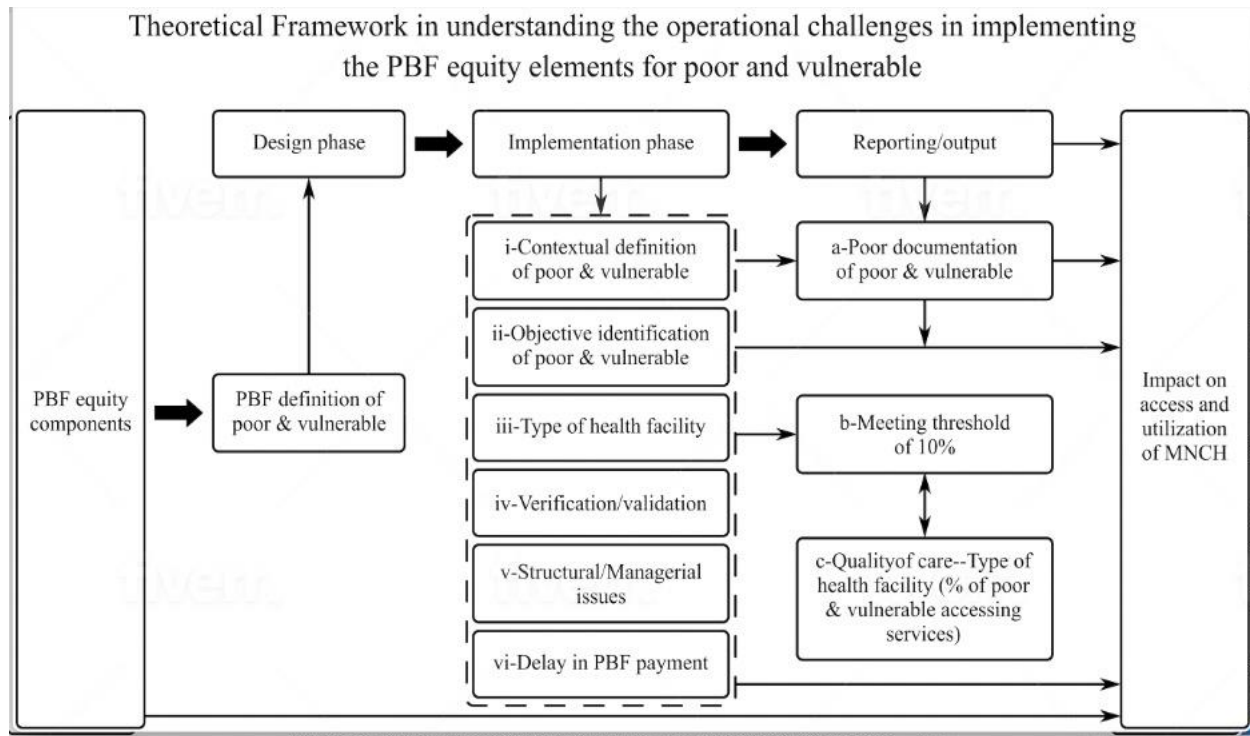
The non-poor and vulnerable had a different perspective; they saw the cost of services as extremely high and expected a reduction from PBF. Meanwhile, one private for-profit facilities reported that they have instituted some policies due to the PBF equity strategy to support transportation for women, feeding, and delivery of supplies.

5.9 Understanding the Implementation and Challenges of the PBF Equity Strategies at the Health Facility and Community Levels

5.9.1 Design Phase

Definition of PAV: Based on the design of the PBF equity elements, the identification of PAV is at the discretion of the health facility or the use of community health workers. This process of definition and identification of PAV at the point of care are highly subjective. The study found two separate concepts being used: “poor” and “vulnerable.” These had the same meaning but were defined and measured differently. PAV is defined in PBF as extreme poverty, which applies to providing services to those considered within the lowest income quintile. It is noteworthy that “poor” could mean anything to anyone at the point of care at the health facility. Alternatively, the definition of “vulnerable” in the context of PBF is circumstantial; it could relate to how the patient presents themselves at the point of care (accident, lack of money, and internally displaced people) but does not necessarily mean someone is poor based on the extreme poverty consistent with the scale used to categorize income quintile.

Figure 7.1. Framework of the challenges of implementing PBF equity elements for poor



5.9.2 Implementation Phase

i) Contextual Definition of PAV: PAV is mainly defined at the level of the facility, and it is at the discretion of the health provider or health administrator to categorize who is PAV to be eligible for subsidies or free services. This could introduce a potential problem regarding whether people are classified correctly to reflect extreme poverty related to the lowest income quintile. These are potential implementation issues, and health facilities are applying this classification differently based on their expectations and in different situations and scenarios.

Therefore, the PBF rationale for a 10% threshold in providing services for the PAV is not only based on targeting the lowest income quintile, given that most of the criteria used at the health facility relate to vulnerability. This vulnerability is a concern because, according to PBF, situations exist where

even the senior divisional officer or regional delegate may be considered as vulnerable at the point of care, perhaps due to circumstantial factors, but this does not necessarily mean that they fall within the lowest income quintile. Therefore, circumstantial criteria relate to the ease of accessing services at the point of care without creating any financial inaccessibility, but this does not mean it has an impact or it makes a difference in the poorest income group. It may instead increase the use of services amongst the richest quintiles. This may also explain some of the findings in other countries where PBF was seen as a pro-rich policy [6,7]. The advantage of vulnerability is that it can be more objective than subjective because it depends more on the circumstances in which the patient presents themselves; however, this does not imply that they are poor based on the lowest income quintile. Moreover, the definition of poor varies from one context to another, and different culture, people and place may define poor differently.

ii) Objective Identification of PAV

The limitation of using the facility to identify the poor relates to the fact that household income or expenses-related data that usually quantifies the household income quintile is not collected at the facility level. Therefore, data obtained from approaches such as interviewing or conducting social inquiries at the facility to identify who is poor at the facility level contradicts the household survey data used to categorize the wealth index for poor incomes; this may instead apply to vulnerability. Secondly, the poor can be perceived and defined differently by individuals and their community, and this may be applied differently. Facilities mainly used the circumstantial approach and each facility applied different approaches. This is at the discretion of health facilities to identify the poor as most of them were internally displaced, and before PBF, the focus was more on orphanages, as some facilities reported. Thus, continuing identification of the poor using the facility at the discretion of providers may result in missed classification and even fraud. These factors should be considered, and those considered in classifying households into low-income quintiles for the use of maternal services should be considered in identifying the PAV since they consider various changes over time and space.

iii) Type of Health Facility:

Considering that Cameroon delivers care through the public and private sectors and the private sector comprises both confessionnal health facilities and private for-profit, the private sector provides up to 50% of the population's care. This is important in designing and implementing all policies and interventions. Some confessionnal and private for-profit health facilities not meeting the threshold value for PAV requires additional enforcement strategies. There appears to be an organizational culture of not paying more to health workers; especially on confessionnal facilities, however, this is based on payment delays. Although participants embraced the innovative approach of the PBF equity package, challenges remain since the provision of PAV services strongly depends on the health facility. For example, based on previous findings (chapter 4), the cost of antenatal care and skilled birth delivery increased with the introduction of PBF quality indicators in some health facilities [31]. The PBF equity strategies may be viewed as an alternative mechanism to partially offset this increased in cost by reducing out-of-pocket expenses for the poor, who are more responsive to changes in cost [8,]. Given the increase in cost specifically for the first ANC visit and skilled birth delivery in some health facilities, objective identification and classification of the PAV are required to produce potential changes in the use of ANC and skilled birth delivery by the poorest quintile.

iv) Verification/Validation

Providers reported some challenges in relation to the peer review verification process. They reported that reviewers have different judgment and interpretations of the indicators, and they are not sure if it is bias or misunderstanding. Moreover, some indicators need to be revised because some of the indicators were listed in line with some of the old practices in the previous system and those practices have been abolished with PBF. They believed there is a need to discuss the quality checklist together with them to agree and make recommendations to ensure both parties are on the same page.

“The issues with the indicators can even be serious than I am able to present. I know the verifiers on the field are trained but somehow a clinician judges something differently from just a verifier on the field who is working strictly on those indicators and there are areas we really do not agree on. Clinically, you have reasons, but because they have to work as per their indicators it becomes difficult. For example, PBF has a definition for sexually transmitted

infections. They want you to show that you had a positive chlamydia test, or a positive syphilis test but a clinician has the right to make the clinical diagnoses even if there is no laboratory confirmation. If a man has ureteral discharge, it's an STI until proven otherwise; even if he cannot prove from a laboratory point of view to confirm that it's an STI. In that case it counted but the criteria are not met, it is an over-reporting for which you will be penalised. And we lose money from the penalty". (Provider, Buea)

v) Structural and Managerial Issues

Many actors are involved in identifying and validating the PAV. This makes the process more cumbersome, and the actors misunderstand the criteria for eligibility. However, some CHWs reported that they were asked to refer patients to the health facility and indicate when they saw a need for the PAV classification. CHWs must also validate this process with the quarter head; however, some quarter heads are not versed with the community and households, and some require motivation. Health facility staff reported that some CHWs do not understand that not all referrals imply validation or approval; they are coached to ensure they do not make promises to the patient upon referral, and this causes tension between the health facility and CHWs, as the CHWs report losing their income. Additionally, health facilities also lose income during PAV validation, which could result from errors in identification and documentation.

Some facilities reported that the cost to treat a pauper is not equivalent to what is received in return to offset this cost. Some proposed an increase in the pay package and number of paupers considered because if the health facility continues to pay more than what PBF reimburses for pauper cases, it may affect the finances of the health facility in the long term, and this may not help its support of the PAV.

Issues were raised in some health facilities regarding readmitting a pauper and making them repeat the same procedure. Some PAV are followed up with their social network to educate them on family responsibility, and changes were reported, as much negligence was attributed to ignorance. Therefore, some facilities reported that they continued to educate families on how to take care of loved ones when they were alive rather than focusing on a culture of taking care of their deaths.

vi) Delay in Payment and Impact on PAV

This was a common theme across all levels and has been documented in the literature in other countries. This was reported to be the main challenge, and it was related to the expectation of providing services to the PAV, especially in the private sector. For example, providers reported that PBF has empowered them to be able to hire staff, and they have to pay the staff s from PBF incentives, it becomes challenging to manage such staff with delay in payments and sometimes there is transfer aggression on the patient *“Before PBF we had private practice where the staff get something from what patients pay but with the coming of PBF, it is no more because PBF took up the motivation of staff. So now we can have private practice when PBF does not meet up. So, the delayed payment is one of our major challenges”* (Provider, Tiko)

5.9.3 Reporting/Output Stage

a) Poor Documentation of PAV

The PBF team reported poor registration of data due to a lack of collaboration among staff and poor supervision. Initially, there was a focal point; responsible for entering data however, this was not feasible since it failed if one person could not work, it was challenging to get someone for replacement and who understand how to enter the data. The data are verified before the verifier arrives. It is noteworthy that some facilities fail to manage the PAV well and they have abandoned files because of inability for patients to pay bills. Some health facilities would not include the names from the abandoned files as PAV even when the facility is unable to meet the threshold for the PAV because they hope the families will eventually pay at some point.

b) Meeting the 10% Threshold Value

Some facilities are not meeting the 10% threshold required for the PAV; this was attributed mainly to payment delays and was mainly common in private facilities. Management continues to provide implementation strategies to encourage each health facility to create a pauper committee in their respective areas with opinion leaders, religious leaders, and even representatives from the centers, such as the chief of the center from this committee. This committee can decide based on their context who is

considered poor or define poor based on their context. They can easily identify the poor because, in each community, they know who cannot afford basic needs. Instituting paupers' committees in all the health areas, where lists of the poor are compiled, will improve the management of the PAV; however, this must be considered alongside constant payment of the PBF equity bonus to achieve smooth implementation. Developing a paupers' community is essential alongside using CHWs to identify new and eligible members who can be referred to join the committee based on specific criteria considered fair and agreed within each context.

One important observation at this stage is to assess if all health facilities declared up to 10% of PAV as required, and the percentage of facilities not meeting the threshold and the rationale for this—though delay in payment was reported, but there may be other aspects related to organizational culture and structure of the health facility.

c) Type of Health Facility in Improving Access to Services and Quality of Care

Participants have long appreciated the quality of care in confessional facilities that encouraged them to use these services despite the high cost compared to public facilities. Quality of care, specifically regarding provider communication strategy, is important because the influx of patients in confessional facilities is likely to affect the volume of services offered to PAV. More patients in such health facilities with delays in payment may have a negative impact on the support to the PAV. Women reported that they preferred to attend the confessional health facilities because they understood their payment mechanism. Due to the attitude of health providers in public facilities, they prefer to attend confessional facilities. Finally, this influx of patients in confessional facilities may also affect confessional facilities in meeting the 10% threshold.

5.10 Impact on Access to and Use of Antenatal Care and Skilled Birth Delivery

The PBF design elements for equity may not apply in all contexts in terms of implementation as designed due to various contextual factors. In Cameroon, the heterogenous nature of the health system can influence the way some of these elements are implemented within and across sectors.

Most of the health facilities reported similar characteristics in defining poor and vulnerable, there were still important differences in the way each sector would consider categorizing poor and vulnerable and this had an impact on access and utilization amongst the poor. For example, private facilities reported that this was like the first time they are providing services to the poor for free or subsidized because they are for profit, and some of the facilities have dropped down their prices with the aim to motivate and stimulate demand but the prices are still high compared to the other sectors, while confessionnal facilities would provide option for those who cannot pay their bills to pay in instalment over time.

In addition to the limitations discussed above in terms of PBF definitions and identifying and classifying the PAV, the PBF equity strategy also has limitations regarding the provision of services because it is not expected that all the PAV will be provided services at the point of care given its subjective nature. Secondly, there is a cap of 10%, so if a facility is receiving an influx of PAV patients, this may skew the results in one direction, especially as participants prefer to attend ANC in public services, for example, due to cost and obtain services in private facilities during delivery due to quality. Private facilities are hesitant to provide services under the category of PAV for several reasons relating to payment delays. Table 7.9 below indicates findings triangulated from chapters three to six.

Table 7.9. Using study findings to understand the PBF design elements and anticipated effect on equity for ANC and skilled birth delivery in Cameroon

Design Elements	Effect on equity and financial protection	Target /Potential Beneficiaries	Context of Implementation /Assessment	Level of assessment Health Facility (based on study findings)	Individual level (based on study findings)	Policy Implications from Findings
1.choose services that are underused by the poor	Increased use of selected services by the poor.	Pregnant women, Households, adolescent girls, and women, health facilities, health providers	For ANC, skilled birth delivery-home visits and community health worker referrals	Health facilities reported an observed influx of patient and potential increase in utilization in some health facilities but no evidence on the poor. However, facility reported provision of services to the poor which was not existing before PBF	Some women experienced increased in OOP expenses for first ANC and C-section after PBF due to introduction of quality indicators. Women would love to reuse services for skilled birth delivery based on the quality and cost	Introduction of quality indicators for first ANC and skilled birth delivery is relevant for content quality but has a cost implication which needs to be taken into consideration in a system with existing high OOP expenses [31]
2. Pay providers more for reaching a poor person than a non-poor person	Increased use by the poor more than the non-poor	Pregnant women, members of households, health providers	CHW referral, health facility assessment PBF pays equity incentive for each indicator served to the poor 4x for that indicator	Objective identification of poor and vulnerable is required to ensure the 4x payment for indicator is targeted to the “poor”.	Criteria for identification of poor and vulnerable can be bias and may result in miss classification	Meeting the 10% threshold for some health facilities is a challenge with the delay in the payment of PBF incentives. Delay in payment may hinder health facilities to continually provide care to poor and vulnerable and

						impact on quality.
3. Pay providers more for services delivered in poor areas	Increased use by people in poor areas more than by people in non poor areas; more resources pushed to poor areas	Health areas, health facilities, Pregnant women	The district/regional equity incentive is based on equity scores which is assumed to have a trickle-down effect as areas with high equity scores should get more bonus than those with low equity scores	Incentives provided to providers can stimulate demand but delay in payment of the PBF incentives can potentially affect the provision of services to the poor and vulnerable	Change in cost and incentives provided can stimulate demand but attitude of health providers (quality) is an important factor in determining utilization amongst the poor, especially their choice for skilled birth delivery [32]	Utilization of services by the poor is not only determined by a change in cost, but also a function of quality and other factors including cultural. [32]
4. Subsidize user fees	Reduce out-of-pocket cost, thus enhancing financial protection and increasing use of services	Health areas, health facilities, Pregnant women	Cost for certain services like ANC, Skilled birth delivery, is subsidized for the poor and vulnerable and in some cases, the service is provided for free	Identification at health facility is subject to bias, no objective assessment to qualify patients. Mostly un expensive item that have been subsidized for example, iron medication,	Some women reported that they received free services and subsidized services especially internally displaced persons	Some observed changes in cost for family planning and medication, however, the cost increased for first ANC and skilled birth delivery due to increase in the quantity of test to enhance quality [31]
5. Incentivize community health workers	Overcoming information and social barriers for the poor	Community health workers, pregnant women, health facilities, households	The use of community health workers especially during home visits facilitate identification of poor and vulnerable individuals and women unable to	Health providers are frustrated with CHW's approach in the identification and referral process for poor and vulnerable	CHWs frustration in communication and understanding of the criteria for validating poor and vulnerable as provided by the health facility and the referral	Providers assumed the need for a reinforced training on CHW on the equity package and clearly define criteria for identification of poor and vulnerable based on context. CHW

			seek care are referred to health facilities		payment system	proposed proper communication and documented procedures and appreciation of circumstantial situations
6.Add complimentary demand side incentives	Overcoming financial barriers (such as transportation cost and related expenses	Health areas, health facilities, Pregnant women,	One private facility reported this	Rare practice in all health facilities and almost non existing in the context.	Internally displaced women reported received some baby support like napkins after delivery. Institutional policy implemented due to PBF by the lone private facility to support PAV women	Demand side financing is essential to balance supply side strategy especially in such context with existing high out of pocket expenses but important to consider universal and/or targeted approaches

Note: The first two columns are based on the World Bank data (as shown in table 1) and the remaining columns is based on research findings of the thesis

*Examples are based on context from health facility in the study setting

6. Discussion

The key findings of this study indicate that introducing PBF equity elements and strategies has positively impacted the overall motivation of health providers (doctors, nurses, midwives) in delivering care to those considered poor. It is also considered a mechanism to provide services to the PAV at the point of care. This study revealed experiences and perceptions from both the supply and demand sides. From a supply-side perspective, health care providers expressed positive experiences and saw PBF equity elements as a novel approach to reach the poor but with challenges concerning payment delays. This payment delays have been reported in literature [8,9,33]. From the demand side, some women reported changes in providers' attitudes concerning care quality which corroborates with an earlier study from Cameroon [34] and out of pocket expenses for specific maternal services, and some experienced the provision of free services for the first time in health facilities or a payment reduction, especially for C-sections. These reported changes by some women in relation to cost reflect some of the findings in Tanzania in the way PBF facilitating access to skilled birth delivery [33]

Health facilities are expected to meet a threshold value of 10% per indicator for PAV, but most facilities do not meet this expectation, especially confessional facilities. Health facilities with social service departments mainly use the social welfare unit and interview the patient to evaluate whether they meet the criteria; this is only conducted at the point of care. If a patient cannot pay their health bills, they are referred to the social welfare or the assigned administrator at the health facility, who determines whether the patient meets the criteria. This is solely at the discretion of the health facility or the assigned individual. Objective identification of the PAV is critical for proper classification and meeting the 10% threshold by health facilities is important in increasing the utilization of services by the poor. PBF equity strategy provides for the PAV, however, implementation challenges in identifying and classifying the PAV can affect the outcome.

The irregularity of the PBF payment mechanism shapes how providers engage in sustaining aspects of the PBF equity elements, and the motivation and quality of services are likely to decrease if the payment mechanism is not addressed.

7. Policy Implications

The World Bank published PBF tool proposes three options to identify poor and vulnerable within the PBF equity program [1]; however, it is evident that there is a lack of theoretical consensus in the definition of poor and vulnerable and this can be problematic as “poor” can be defined and interpreted differently from one context to another. This may not only apply in the context of the PBF equity elements, but in a broader perspective on how policies in place are defined to identify and categorize who is poor and vulnerable within a specific context to ensure appropriate identification and classification of individuals in addressing equity issues in maternal health services.

Quality of care is a strong indicator, drawing many women to private facilities, such as confessional facilities, which cannot meet the 10% threshold due to several factors such as payment delays. This affects the services they would have provided to the PAV due to limited finance to run the facility, fear of the unknown, risk of providing free services to the PAV, and precautionary measures these facilities are engaged in. Thus, improving quality in public settings with strict enforcement strategies will help enhance some of these limitations in the confessional facilities in providing services for the PAV. There should be policies in place to reduce the delays in payment.

A demand-side mechanism such as home visits is also an encouraging mechanism, but it is necessary to properly educate and train the community health workers on careful identification and the expectations of the equity program. This structure can help enhance health promotion activities for the community and health facility. The social service team can work with the CHW more closely to enhance the identification process of PAV. Research could further explore the impact of PBF equity program on the perceived health of individuals and inequality in accessing care.

8. Research Implications

This paper establishes the need for further research and directions regarding the data to be collected in assessing PBF equity elements in the context of maternal health services. It assumes that assessing the effect of PBF equity elements on maternal health services requires an understanding of how the PAV is defined, the implementation process and the challenges given the complexity of the concept. First, the use of grounded theory provides insight and explanations regarding providers' experiences and the processes and meaning they attribute to this policy. The findings also provide inputs or information for other countries implementing PBF equity strategies.

Methodological limitations may arise in assessing equity if data are only focused on demographic and health survey household data. This is because the definition of PAV and identification at facility level posed a significant challenge that could result in misclassification bias. It is necessary to develop adequate methodology to assess equity in PBF, considering the instruments, definition, and implementation of the equity package. The World Bank proposed relevant methodological approaches to measure and assess the effect of PBF on equity [1], but it is likely that these methods of using only household characteristics surveys may not be enough in the context of PBF without considering the definition and implementation process of the equity elements in each context. The use of CHWs only helps provide referrals or identify potentially vulnerable individuals who may not necessarily fall within the lowest income quintile and does not guarantee that they will be given care as a PAV patient on reaching the facility. Therefore, based on our findings and our theoretical framework, we have proposed the following approach in Table 7.10 to data collection for consideration when assessing the effect of PBF on equity on maternal health services.

Table 7.10 Proposed steps for data collection to assess effect of PBF on equity

Steps	Definition	Description
1. Definition of poor and vulnerable(contextual)	Consideration of how PAV is defined in the specific context within the PBF program and within the context in general	Poor is defined differently from one context to another, it is important to contextualize poor and vulnerable to guide data collection
2. Variable definition	Define the variables to be collected based on the characteristics in the definition of PAV, and consideration of the identification, and validation	Consideration of factors described in the framework in figure 7.1

	process of PAV	
3.Data collection stage 1	At health facility -identify those considered as PAV and non-PAV. Conduct exit survey using variables defined in step 2	Sample secondary data from health facility where PAV is validated to define the sample for PAV and non-PAV women
4.Data collection stage 2	Follow-up data collection at household for the same participants identified at health facility as PAV and non-PAV	Conduct household survey on the same participants for PAV and non-PAV to assess household characteristics and other relevant variables defined in step 2
5.Scale	Define the scale based on contextual definition of poor and vulnerable	Apply scale to assess differential effect on PAV and non-PAV
6.Analysis	Apply existing analysis approaches and quantify the effect on PAV and non-PAV using the defined scale	Compare differences and assess changes within and across groups using the contextual definition of PAV as defined in step 1

9. Study Strength and Limitations

A few studies have however focused on examining the differential effect of PBF on equity [7-9]. However, this study is one of the first to examine how the PBF equity elements are defined and implemented in a specific context. The findings suggest the need to understand how these elements how defined in order to guide data collection and the scale employed in assessing the effect of PBF on equity. The framework can help direct data collection for the effective study of equity and its various stages and indicate what to consider regarding data collection and potential bias. The framework can also be used to assess the PAV package to ensure it meets the context standard and not necessarily the facility perspective. It can also help monitor the future design of studies related to equity in defining PAV and methodological challenges regarding assessment since collecting data using a scale to quantify income when the contextual definition and classification of PAV was not based on the same scale or income classification is an important methodological error, and the results may likely not reflect the situation. Additionally, there may be some important differences in the definition of PAV in the context of the study given the ongoing conflict that included IDPs within the category of PAV. This definition may vary from regions that are not affected by conflict.

Limitations concerning saturation in the grounded theory approach arise because only the person analyzing the data can confirm that saturation has been reached, so it was necessary to ensure all questions were answered. However, the use of triangulation and member checking is a strength to minimize the bias and provide a broader perspective and validation in the interpretation of the data. The study is limited to the health facilities in the Southwest region which may differ from the French-speaking region—however, it provides an overview of the processes and challenges that may be common across sectors in all regions given the national scaled-up of PBF.

10. Conclusion

No single path may exist to achieve universal health coverage, but all journeys toward achieving UHC start with bold commitments toward equity and quality of care. Equity is actualized in UHC with the goal of ensuring that all people obtain the health services they need without exposing the users to financial hardship. There has been an increase in the number of programs and the way projects are designed with a focus on equity aimed at improving access and utilization of maternal services among the poor and vulnerable in sub-Saharan Africa. However, the concept of equity and the way poor and vulnerable is defined and applied in project implementation within specific contexts is not well known. The theory generated from our findings suggest that the impact of the PBF equity elements specific to maternal health depends on: i) shared understanding to the definition of PAV among different stakeholders, including providers and users, as well as how the PAV is operationalized (structure) and ii) the appropriate and timely payment of incentives to health facilities and health providers. The next step of this study is to assess the differential effect of PBF equity elements in accessing care using the proposed theoretical framework for data collection.

Contributions: MN conceived the study and design the methodology, data collection, analysis, investigation, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. CA assisted in coding and inter-rater assessment. CA, RD, RP and OA critically revised the manuscript and provided feedback. All authors reviewed and agreed on the final version of the manuscript.

Acknowledgements

We would like to thank Vivian Welch for her valuable feedback on this paper. Thanks to department of Epidemiology and Mobility bursary at Ottawa University and my supervisors for financial support to facilitate data collection. The research assistants for their great assistance in field activities and all the health administrators whose support made this research possible.

Patient and public involvement

This study involved pregnant women attending antenatal care or who have delivered at the time of data collection at a health facility.

Funding: This study received partial financial support from thesis supervisors to facilitate data collection

Competing Interest: None declared

Data Availability: Data relevant for the study is included and/or attached as supplementary material.

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Figure 7.2. Registers for PBF verification including poor and vulnerable and non-poor and vulnerable at a health facility



Photo credit: Miriam

Chapter 8

An In-Depth Qualitative Study of Health Care Providers' Experiences of a Performance-Based Financing Program as a Nation-Wide Policy in Cameroon

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1. Preface

This chapter reports on the fourth objective of my dissertation, which was to explore the experiences of health care providers and PBF managers in implementation of PBF. This chapter builds on a previous study to examine the experiences of health care providers before and after PBF. I designed the study and conducted interviews with key informant health care providers. I transcribed the interviews with the help of research assistants and performed the data analysis, interpretation, and writing. Drs Yaya and Little supervised the design and methodology and critically revised the manuscript. Drs Deonandan and Pongou critically reviewed the manuscript. All authors reviewed and approved of the final version of the manuscript.

Status of the Manuscript: Submitted PloS One Medicine

Ethics Approval: Required and approved

2. Abstract

Background: The introduction of PBF has led to substantial changes in the daily activities of healthcare providers in relation to documentation procedures, verification processes, quality checklists, participation, and autonomy. Following the adoption of PBF as a national strategy in Cameroon in 2017, health facilities have been expected to sign PBF contracts on a quarterly basis. Research on the experiences and opinions of service providers in the context of PBF is scarce, despite the policy aiming to boost motivation and improve performance. The experiences and challenges of healthcare providers and PBF implementers are central to the implementation, acceptability, and potential for sustainability of the policy, especially in Cameroon, where the policy has been adopted nationally

Objectives: The study explored providers' experiences before and after PBF, the challenges and facilitators in the implementation process. It explores the impact on their day-to-day activities in the process of care delivery.

Methods: The study is an in-depth qualitative study that strives to provide multiple descriptions of experiences and provides some insights of health providers experiences with PBF. Purposive sampling was used to identify the key characteristics of the participants relevant to the study. A snowballing technique was used to further identify eligible participants. Only healthcare providers who were exposed to the previous system were eligible and could reflect on and provide meaningful data that captured the everyday experiences before and after the implementation of PBF. Data were collected from three districts in the SW region of Cameroon from May 2021 to August 2021. Data were transcribed and analyzed using MaxQDA.

Results: A total of 18 interviews and 3 focus group discussions (14 participants) were conducted with health care providers and key stakeholders involved in PBF. The respondents described a range of changes that they had experienced since the introduction of PBF. Each of these changes was categorized as either positive or negative. Positive changes were framed into 14 dominant categories: motivation, negotiations, innovative, resource allocation, autonomy, decentralization, transparency, improved quality of care, separation of function, performance, equity considerations, opportunity to recruit, participation in

decision-making, and improved access to and utilization of maternal health services. The main challenges (negative experiences) reported were framed as nine categories: management of change, retention issues, conflict of interest, poor understanding of the PBF concept, resistance to change, verification challenges, delays in payment of PBF bonuses, data entry and documentation, and challenges in meeting the equity considerations of the poor and vulnerable.

Conclusion: PBF has brought about changes in the daily activities of health providers in Cameroon and despite the challenges, providers preferred the decentralized approach to the centralized system.

3. Introduction

Performance-based financing (PBF) is a supply-side strategy, with the primary objectives of improving quality, boosting motivation, and improving the performance of health workers [1-11]. Therefore, the health provider is the key client (agent). Health providers in Cameroon and across sub-Saharan Africa as a whole have long been inadequately paid and poorly motivated [2]. This—among other factors—has led to poor performance, staff absenteeism, substantial out-migration, and rural-urban migration, resulting in a great financial loss to the economy and weakening of the health systems [2]. The principal agent theory [1,14], has been used to explain PBF within the health sector, where the interest of the principal (in this context, the Ministry of Health) does not necessarily align with that of the agent (the health worker) [1,14]. Given the centralized nature of health systems, the interests of the principal and the agent are independent and there is usually information asymmetry between the two parties [14].

Some actors perceived PBF as an ongoing process of decentralization that involves tensions and continuous negotiations—thus, evidence generated in relation to its effectiveness is likely to vary by time and space [12].

The introduction of PBF has led to substantial changes in the daily activities of healthcare providers in relation to documentation procedures, verification processes, quality checklists, participation, and autonomy [13]. Following the adoption of PBF as a national strategy in Cameroon in 2017, health facilities have been expected to sign PBF contracts on a quarterly basis. These contracts describe the conditions required to obtain the PBF subsidies. The requirements include efforts to improve management, minimum quality levels, governance and financial inclusion, and clauses for termination of the contract; and there are verifications and sanctions, with detailed rules for quality. Health facilities are expected to present business plans on a quarterly basis; and if they are unable to meet this expectation, it is the responsibility of the regulatory body to intervene and ensures that measures are put in place. In addition, it is not sufficient for the health facility to simply present its business plan; these plans should also adhere to the regulations. For example, for routine renewal of a contract, a minimum quality

assessment score of above 70% is needed, However, for newly enrolled health facilities, there is a grace period of approximately three quarters, with the expectation that the health facility will meet the minimum quality standard in subsequent quarters. After such time, if a quality assessment is below 50%, the contract is unlikely to be renewed. Such facilities are then expected to reinforce their strategies to raise the quality to the minimum before the contract can be renewed; otherwise, they are sanctioned by the regulatory body.

Research on the experiences and opinions of service providers in the context of PBF is scarce, despite the policy aiming to boost motivation and improve performance. The experiences and challenges of healthcare providers and PBF implementers are central to the implementation, acceptability, and potential for sustainability of the policy, especially in Cameroon, where the policy has been adopted nationally. As PBF is a donor-driven policy, local governments struggle to sustain the policy after implementation [15-17]. For example, in West Africa, some countries—such as Benin, Sierra Leone and Mali—initially implemented PBF and then discontinued the programs with the withdrawal of donor funding [6-8]. Countries such as Cameroon, Rwanda, and Burundi have reached scaling at a national level with domestic support. However, in Cameroon, the aspects of implementation and providers experiences given that it is a new policy aimed at improving the quality and performance of health providers remain understudied.

This paper builds on an assessment of health workers' performance and quality of care delivery across sectors in rural and urban settings in northwest Cameroon at a time when Cameroon's health system was centralized and PBF had not yet been implemented (Nkangu, 2007). Most healthcare providers (from public and confessional sectors) reported low motivation, staff absenteeism, poor performance, and dissatisfaction with the health system and were looking for opportunities to either supplement their income or migrate to find better working conditions. A decade later, Cameroon has adopted PBF to strengthen its health system, improve quality of care, and address some of the issues faced by health workers. It is important to explore the experiences

and challenges of health providers, before and after PBF, and the impact on quality of care and performance of health providers.

This is an in-depth qualitative study that strives to provide multiple descriptions of experiences and provides some insights from a principal agent analysis perspective. In-depth interviews were used to explore health professionals' experiences and allow them to reflect on their experiences of changes to the previous structures and of the newly implemented approach, thus enabling previously silent voices to be heard. The study explored providers' experiences before and after PBF, the challenges and facilitators in the implementation process. It explores the impact on their day-to-day activities in the process of care delivery. We sought to identify the challenges in the implementation that could hinder the sustainability of the policy, and what mechanisms in place could be reinforced to ensure sustainability.

4. Methods

4.1 Context and Settings

Cameroon is an LMIC in sub-Saharan Africa, with a population of approximately 26 million as of 2020 [18]. Health care is delivered in the private, public, and para public sectors. The private sector is composed of for-profit and confessional health facilities. Based on a 2012 Ministry of Health assessment, the country has 1,888 publicly integrated health centers, 760 private health centers, 155 sub-divisional health centers, and 164 district hospitals [5]. The Ministry of Health defines the health policy, the regional level translates the health policy for operations, and the district level operationalizes the health policy into action. The proportion of GDP spent on healthcare was 3.6% in 2019 [18-20] and the operational level receives a small fraction of this health budget. Most resources are allocated to administration and infrastructure, rather than the operational level, where all activities are implemented [21].

There are ten administrative regions in Cameroon, two of which are English speaking, namely the Northwest (in which there was an assessment of HCW performance and quality of care in 2007) and the Southwest. There has been armed conflict in both regions since 2017, but the Southwest region was

relatively accessible at the time of the present study. Health districts from the Southwest region were included in the PBF pilot study in 2012 and the PBF impact evaluation assessment of 2017. We carried out the study in the Buea, Limbe, and Tiko districts within the Southwest region

4.2 Study Design

This study uses a qualitative research approach. It considers the principal-agent approach, which is documented among the essential issues underlying the health systems in most sub-Saharan Africa [1, 7,9-11], where the interests of the principal and agent are not necessarily aligned, given the centralized nature of health systems. Thus, PBF was viewed as a powerful tool to decentralize health systems, in principle addressing the principal-agent problem [7,7-11,14]. This study employs the principal agent approach to understand the experiences and challenges of health care providers moving from a centralized to a decentralized approach in their day-to-day practice. In depth interviews offers opportunity to capture rich and detailed information about respondent's point of view, experiences, feelings, and perspectives before and after the implementation of PBF [22-24].

4.3 Sampling and Participant Recruitment

A sampling frame was used to group the health facilities in each of the three districts by sector. The sample consisted of PBF managers from the national and regional levels, healthcare providers from across sectors, and district medical officers and the regional representatives in this context are the regulators. This was done to gain meaningful data on their similarities and variations. The sample size was determined by the depth of the data and the emergence of common themes, with a saturation point ultimately reached, at which point no new information was reported [22]. Purposive sampling was used to select participants based on their role and time period that they have worked in that role. Thus, we identified as potentially eligible participants who were health providers or administrators who had been working with the health system before the implementation of PBF. A snowballing technique was used to further identify eligible participants. The rationale for selecting participants within this time range was that PBF was implemented in this region in 2012 in a small number of facilities (in Buea and Limbe) and

only later, in 2017, scaled across all health facilities. Thus, only healthcare providers who were exposed to the previous system could reflect on and provide meaningful data that captured the everyday experiences before and after the implementation of PBF. In addition, the breadth and depth of their experience over time had enhanced their understanding of the health system, while their exposure to PBF (over a minimum of 4 years) provided valuable insights into potential sustainability mechanisms and approaches that could inform the PBF program in Cameroon.

4.4 Data Collection

The first draft of the interview guide was developed by the primary investigator and revised by the co-authors. The interview guide comprised six key questions in relation to their experiences, challenges, and potential for sustainability, with flexibility for probing as appropriate. The interviews commenced with warm-up questions that concerned the general overview of the discussion and provided a more comfortable environment for the participants. Warm-up questions were asked about PBF and the interviewee's role in the program or health facility. These were followed by specific questions and probes about their experiences with the newly implemented reform, as compared to the previous system of operation; their understanding of the PBF policy; the challenges and facilitators; and the policy's potential for sustainability [Appendix E]. Each interview ended with an opportunity for the interviewee to propose their own policy recommendations and suggest areas to be addressed. The same questions were put to administrators and PBF managers, with only slight changes to reflect the participants' respective roles. The data were collected between May 2021 and August 2021 and member checking was conducted in July 2022.

An in-depth semi-structured interview format was used to allow participants to freely express themselves. All the interviews were conducted by the lead researcher (MN) and recorded. The interviews were primarily conducted face-to-face in the offices of the interviewees. The interviews were audio recorded and varied in length, ranging from 30 to 45 minutes each. No relationships were established between the interviewer and participant before the start of the interview. The purpose of the study was explained to the participants before the interviews, and informed consent was obtained. Field notes were

collected during the interviews to record relevant non-verbal considerations or actions—for example, the tone, mood, and coherence of the respondents. Each participant's data were coded to ensure confidentiality and anonymity. Three focus groups were conducted at a convenient location with the community health workers (CHWs), with one group for each district, and each lasted for up to 1.5 hours.

4.5 Data Processing and Analysis

After the interviews, the audio-taped recordings were transcribed verbatim and compared with the recordings for accuracy. The transcription was done with the help of research assistants. The data were read several times, allowing the researcher to become immersed and to make notes and reflections. The data were exported into MaxQDA, and the initial codes were developed using free codes and “in-vivo” coding, with line-by-line coding using the participants' own words and the field notes, giving specific attention to statements that reflected their experiences and understanding, the challenges and facilitators, and sustainability. The lead author (MN) and a research assistant conducted the initial coding, then the initial codes were compared for consistency and to ensure the trustworthiness of the process, with attention given to experiences of the implementation processes, the challenges, and the individual's understanding of the PBF policy. Keywords and phrases were documented by the investigator and research assistant, as they engaged with the data. The notes were grouped into a coding scheme to create subcategories. These subcategories were then compared, contrasted, and revised by co-authors SY and JL. Finally, subcategories reflecting similar content, trends, and understandings were merged to produce main themes. Two independent coders (MN and a research assistant) independently analyzed the transcript and coded the data, using various themes to assess the inter-coder reliability and trustworthiness of the findings. Inter-coder reliability was discussed among the coders, who shared varied interpretations to enrich and finetune the analysis and, ultimately, to converge into a shared interpretation of the data. Member checking was conducted with key respondent to ensure the interpretation of the data reflected their responses and no major changes were made. The findings are reported using the criteria for reporting qualitative interviews (COREQ) [25].

4.6 Ethics

The Bruyère Research Institute at the University of Ottawa approved the study (# M16-18-057), and administrative clearance was obtained from the Faculty of Science, University of Ottawa (#H-02-19-2829). In Cameroon, we obtained ethical approval from the University of Buea Faculty of Health Sciences (Ref 2020/1342-02/UB/SG/IRB/FHS) and administrative clearance from the regional delegation of public health in the southwest region (Ref R11 MINSANTE/SWR/RDPH/PS864/715). We obtained informed consent from all participants. They were also informed that once they chose to participate, they could withdraw at any time or chose not to answer any questions, to which there would be no negative consequences. To ensure confidentiality, all personal information were not included in transcripts and quoted texts.

5. Results

5.1 Characteristics of Participants

A total of 18 interviews were conducted with key stakeholders involved in PBF: the national and regional technical PBF unit (3); Ministry of Health regulators (3); health providers, including nurses, midwives, and doctors (12); and three focus group discussions with CHW (14, table 8.2). The providers were from private, public, and confessional facilities (table 8.1).

Table 8.1. Characteristics of health providers and administrators for key informant interviews

	Tiko	Limbe	Buea
Health care providers			
Nurses	2	1	2
Midwives	1	0	2
Doctors	1	1	1
Administrators including regulators and PBF managers (referred in text as stakeholders)	2	1	3
Total	7	3	8

Table 8.2. Demographic characteristics of respondents, CHW focus group, Buea, Tiko and Limbe districts

Participants	Age	Level of education	Marital status	Employment status	District
CHW1 Male	39	High School	Married	Employed	Buea
CHW3 Woman	38	-	Married	Not working	Buea
CHW4 Woman	39	Primary	Married	Employed	Buea
CHW6 Woman	34	Secondary	Single	Employed	Buea
Participants					
CHW1Male	33	University	Married	Employed	Tiko
CHW2Male	41	High School	Married	Employed	Tiko
CHW3 Woman	42	High School	Married	Farming	Tiko
CHW4 Woman	43	Primary	Married	Employed	Tiko
CHW5 Woman	39	Secondary	-	Employed	Tiko
CHW8 Woman	40	Secondary	Single	Not working	Tiko
Participants					
CHW2 Male	43	Secondary	Single	Self employed	Limbe
CHW3 Male	49	Primary	Married	Employed	Limbe
CHW6 Woman	42	Secondary	Single	Farming	Limbe
CHW7 Woman	47	Secondary	Single	Farming	Limbe

Not working implies they do not have a contract with a health facility under the PBF program

The results were categorized into four primary themes, with subthemes that reflected the positive and negative experiences:

The respondents described a range of changes that they had experienced since the introduction of PBF. Each of these changes was categorized as either positive or negative. Positive changes were framed into 14 dominant categories: motivation, negotiations, innovative, resource allocation, autonomy, decentralization, transparency, improved quality of care, separation of function, performance, equity considerations, opportunity to recruit, participation in decision-making, and improved access to and utilization of maternal health services. The main challenges (negative experiences) reported were framed as nine categories: management of change, retention issues, conflict of interest, poor understanding of the PBF concept, resistance to change, verification challenges, delays in payment of PBF bonuses, data entry and documentation, and challenges in meeting the equity considerations of the poor and vulnerable (table 8.2).

Table 8.3 Themes from the data

Themes	Positive categories	Negative categories
1. Transition from centralized to decentralized system	Motivation, autonomy, decentralization, Negotiations, opportunity to recruit, transparency, separation of functions, participation in decision making	Conflict of interest, resistance to change
2. Quality of care	Performance, process of care, innovative, equipment, motivation	Proper documentation, data entry, verification challenges
3. Access to care	Home visits, equity considerations, resource allocation, subsidized cost	
4 Delays in payment		Meeting equity consideration, verifications, retention, conflict, performance

5.2 Transition from a Centralized to a Decentralized System

The process of change was characterized by enormous challenges at all levels. These challenges were not unexpected, as this was a new reform running parallel to the existing health system and involved a process of decentralizing a centralized system. The data revealed that these challenges persisted while the system underwent the process of adaptation. The changes experienced at the national level were accompanied by conflicts of interest, resistance, and sometimes threats, especially in relation to maintaining the status quo and an attempt to reverse the allocation of financial resources. Drawing from a principal agent theory analysis, these tensions are obvious and enables the process of negotiations and readaptation of strategies.

“As a new concept the key challenges was how to adequately adapt the principles within existing laws, rules ,regulations, habit, habits that have been developed over time that are even more than laws, so, those challenges are there and even to get those who are supposed to implement these principles to adhere correctly to the principles by shifting away from their old habits ,is a big challenge so they are not only challenges but also threatsthat one is clear and we are very conscious of that, that is why there is that component of constant sensitization, constant coaching, supervision, and re-adaption of strategies.” (Stakeholder)

“PBF is a reform coming in another context that have laws in place for example in Cameroon it is centralized system, all decisions are centralized, and you want to decentralize decisions, so it causes friction between PBF and the system up to now, and so, you have people rejecting PBF

saying that it is violating the law. For example, in PBF you have to manage participation of all personnel, and transparent, it is not usual with the directors in a centralized system to seat with their personnel to decide on how to spend the budget and take decisions, they want to decide alone and send to the personnel and that is not something easy to break through” (Stakeholder)

Participants explained the importance of aligning PBF to the national context, as well as adapting the principles of PBF to the realities of the country, because a policy cannot simply be transferred from one context to another. The key issues were around linking performance to financing and shifting away from financing inputs and processes that do not yield results to a process of buying results. One major challenge in the process of change was related to the limited budget that flowed to the operational level before PBF was introduced. As noted earlier, this limited budget flow had affected daily functioning on the operational level. However, with the adoption of PBF, some major process of reversing this budget allocation have been met with resistance.

“one of the issues is also that the operational level needs more money than the policy making level, so they needed to reverse the policy, and this was also a challenge in breaking through this process. This, however, has been taken care of and we have already changed the policy only the ministry of finance pays in cash now to health unit, and they paid in based on performance not just as they use to give and you decide how you use it, that is the key policy change we have been able to achieve, with a lot of resistance” (Administrator)

Before the coming of PBF source of funding all came from credit cards, motivations, like mission orders, fuel order. But now, the coming of PBF has come to open the eyes of every stakeholder concern to show that if you work , you benefit, if you don't work you don't benefit. I think you are getting it.... It has come to make us that ,if I have my job description, I'm called upon to give the financial management the data, the database, the dashboard of finances on personnel , I should be able to give it if I don't give they evaluate me ,money will not come and secondly we now know that we give proper management of the PBF forms”.(Administrator)

The transition from a centralized to a decentralized system had facilitated decision-making and participation among providers and promoted budget redistribution and improved motivation. Thus, it had brought positive changes, but some providers argued that it had increased their workload in relation to documentation, while others viewed the increased workload as part of their duties which they ignored in the previous system.

“Now, documentation has increased, we are like no longer nurses, everything has to be written, the registers keep increasing day in day out. Today they bring this one tomorrow they bring so

then you carry out a procedure you can enter that same procedure in about five different registers. So is like we are now secretaries and not nurses” (HCW)

“Yes, documentation is another challenge with the coming of PBF but I will not really say it is a challenge because those are activities we were supposed to carry out but because PBF was not in place we usually ignored those activities for example without the coming of PBF I can consult a patient and don’t enter that patient in my register and nobody will come and investigate but knowing fully well that there is this PBF scheme they will come and validate and pay for my services I am being forced to register those patients so it has increased our workload when it comes to documentation, for example there is a form here for validation, the whole of this table is filled with registers upon registers, but I think that is just the right thing to do but we ignore those activities over the past” (HCW)

“Actually, PBF has come to boost our motivation because on like the previous years before 2012, some health district administrators they will just even, there were so many lapses. So the district because there is what we called, motivation of personnel and motivation of personnel doesn’t mean only finance, except job satisfaction but PBF has come now to make you to know that you will be motivated if you work this and it has increased our performance (HCW)

5.3 Quality of Care

The providers reported positive changes in relation to quality of care, primarily in relation to performance, motivation, facility presentation, equipment, and the process of care. Most providers reported that PBF had helped the community that they served and had improved their own performance and quality of care delivery.

“The services have change compared to before, With PBF we are working with standard quality, before, we were just working. Also, education wise, PBF has help in improving knowledge like many things we did not see important what we neglected in healthcare practice before, PBF has made us understand that what we neglected before is actually important and can be paid more for that service PBF has made us extra miles to learn more skills and better manage such cases and produce quality” (HCW)

“The PBF system is excellent, in the previous system we were just working vague, nothing define, it has increase the level of consciousness of health personnel, patient data, statistics, increase small growing facilities to a mighty facility, we started as a small clinic to this structure and the other structure, if we were depended on the minimal profit we got, we would not have expended, but thanks to PBF we were able to increase and expand our services, in terms of equipment, infrastructures, inflow of patient and the motivation which facilitates the work”(HCW)

“I have been working before PBF was introduce and the difference is,....before PBF some nurses usually talk to patients rudely, but now with PBF all this is gradually changing because

when they realize you speak rudely to patients your name is being removed under the PBF with this all this have stop” (CHW).

“Even the patients can also attest that the quality of services is better than before. Now we pay more attention to our patients, we make sure we check their vital signs when it is necessary, when we check we chart it because our files are being monitored. This means that they go page by page to check what we are doing. They make sure that we are on our feet to make sure that we do our nursing care plan and write it down. Before you could imagine things in your mind and think that you can just carry on your functions without planning for them. But with the PBF we are forced, compelled to do it. If you don’t do it you lose marks and we know that you are paid for the services rendered. It is competitive so gives people the enthusiasm and motivation to give their best. I believe that the difference is so clear from the time we enrolled into PBF and before”. (HCW)

5.4 Access to Care

Most respondents reported an observed increased in access to care within their health facilities. This observed increase in utilization was also attributed to the introduction of equity aspects—which seemed to be a novel approach for providers—and to home visits. Home visits allow CHWs to reach out to poor and vulnerable individuals, especially those who may not have access to the system due to barriers of cost, social status, information, and vulnerability. The use of CHWs for home visits was reported by providers to have had a positive effect on access.

“Home visits for PBF have really improved access. We often see situations that are deplorable, that invokes the feeling of pity, for example, there was a woman that was poor and vulnerable. She had three beautiful boys but these children had terrible wounds which were in dangerous areas I do not know if it was due to rough play or not but we told her she could get treated for free and so she came and we treated them continuously, till the wounds were healed and even now when the children or she are sick she comes to the facility and can even pay at times. So, the home visits are really important for it is there we see those faced with challenges even kids who are malnourished and we are able to help. I really appreciate PBF for this” (HCW Limbe)

“I will say without PBF it would have been very challenging, without PBF I don’t think we would have had a building behind this consulting room. When the government gave us this structure, they told us our building will be the district. They would have been telling us to wait when the district will transfer. However, the coming of PBF has helped us to do a lot of things that normally we will not have been able because we will have still been depending on the government every time, we need something. But now that is not the case. It has really helped us to expand, unlike before this place used to be in cubicles, the hall was tiny but now the hall is big. Before, when you were working you could not have something substantial that you can invest. We were just working and consuming, now when we work PBF has a percentage, and we

have a percentage. It has really helped us. It has also helped to motivate workers. When you are motivated, it will improve your performance”. (HCW Buea)

“the PBF has really help our community as we are able to fetch out paupers in the community and also get contract which we did not have before” (FGD: CHW, Tiko)

Community health workers also reported the importance of home visits but had a contrary view of how they were treated during them. They believed that without them, the nurses would be unable to conduct the home visits effectively as required by the PBF indicator because it is the CHWs who understand the community and the quarters. Providers acknowledged that without the CHWs, they would be unable to effectively implement the home visit. However, some CHWs expressed dissatisfaction regarding how they were paid for the home visits.

“last year home visit we were not being paid so we were paid only when we refer people and after that when they call I just told them I can't be taking a nurse for a home visit she is the only one that was being paid and me taking her to the houses is not being paid so I refuse working for the home visit but with this new contract they have agreed to pay me and I have decided to go for the home visit” (FGD: CHW, Tiko)

The providers emphasized the importance of home visits and how it has helped to increase access to and utilization of maternal services in their communities. The providers reported that this initiative has positive effects on access, as they are better able to relate to patients, drop out cases of women, find poor and vulnerable individuals unable to access health facilities, nurses visiting during home visits, and receive feedback from the community to support quality improvement of the health facilities.

“Before PBF, there were no home visits and also, we only went out when the Ministry organized campaigns such as, children and action or mother and child birth week. It was held twice a year from April to June, for the first one and then November to December for the second one. The program entails going to the community and doing activities such as vaccinating the children with polio, vitamin A and deworm the children as well. This was from the instruction of the Ministry, because when they give instructions, they also provided funds, hence there was no autonomy but with PBF, the hospital was given autonomy, and it was an opportunity for the Community Health Workers to be engaged. In this facility, we have about 18 communities and we target a community per month during which we do free consultations, free lab tests, and even malaria treatment and HIV test, we also counsel women who want to do family planning and administer it to them and those who also want to start antenatal care. So, its really good because with PBF, there is money to do all these things unlike before where there will be complains of no money. It is another way of advertising our services to the community, more often, some don't know about the existence of a facility like ours. It really benefits the community more for it helps the people. (HCW, Limbe,Buea)

5.5 Delay in Payments

Delay in PBF payments was a dominant theme across all levels. This delay was affecting the implementation process at all levels, including the management of poor and vulnerable patients, especially in the private sectors. The providers' primary challenge was the irregular payments of subsidies, which made it difficult for them to carry out their activities because they did not know when they would be receiving payments and—in some cases—they did not have the funds to cover the activities themselves. They reported that this delay in the payment of incentives has effect on recruiting and retention of staff, effective implementation of the poor and vulnerable expectations and performance.

This also created challenges at the level of supervision, as it left supervisors unable to provide effective coaching. This was not because of the escalating violence at the time of the project, but because of staff demotivation, as the facilities were continually asking for money. However, PBF seemed to have improved the resilience and motivation of the health facilities in these regions, as the providers were aware of the policy's motivations (and knew that they would be paid someday, despite the delay), and there was an expectation that they would provide services during emergencies (e.g., internally displaced persons benefit under the category of "poor and vulnerable"). The providers' indicated that delays in payment had had a significant impact on the implementation process. However, despite the identified challenges, PBF was overall perceived as an innovative approach that was helping to revamp the centralized budget design of the health system in Cameroon.

With the delay in payment and other challenges reported by health providers and administration, we probed further to understand if they would prefer the old system to PBF. All providers responded that they would prefer the PBF system to the old system.

"If you were the one, what will you say, obviously we will prefer the PBF system to the old system" (HCW)

5.6 Implementation Challenges

In addition to the payment delays discussed above, the primary implementation challenges reported by participants were around quality, drugs, lack of documentation, verification, management of the poor and the vulnerable, and some contextual issues and the nature of private facilities.

5.6.1 Meeting Minimum Standards for Quality of Care

Participants expressed concerned with the way they are being assessed in relation to the minimum quality standards. Considering that not all health facilities enrolled into PBF at the same quality standard. Some health facilities begun at a very low level, such that it is very difficult for them to upgrade to the expected minimum within a short period. For example, some facilities go operation with limited staff, and some had poor quality adherence if a health facility were consulting 20 patients a month, the expectation would be for this facility to consult 50–100 patients. Thus, it was challenging for them to progress. Although some of these facilities are working to meet the quality standards, this remained a challenge. Facilities are continuously encouraged through coaching to raise their minimal quality measures to ensure they meet up the quality expectations.

5.6.2 Management of Change

Some participants noted that change process remained a significant challenge. This was reported primarily from some experienced nurses, who saw the project as unfeasible and were thus unwilling to meet expectations and sought to undermine coaching sessions. They were not comfortable with new graduates—those with qualifications but limited experience—taking over supervision and focusing on quality standards, especially in the maternity department. Some nurses were resistant to change, but those who saw the advantages of PBF—the social entrepreneurs—were benefiting from embracing change. There were also health facilities that had used PBF money to construct full health centers, extend their maternity ward (see figures 8.1 & 9.1), with recruits, and these were growing—whereas others remained unwilling to change their status quo.

5.6.3 Verification Process

The verification process considers the established criteria to validate a consultation. These criteria include the patient's name, sex, age, and localization. However, most providers were not routinely collecting these data, and the change process made it challenging for some. For example, some patients were documented without proper and detailed descriptions of their sex, age, locality, and so on. However, the verification agent requires these details to verify that this patient was the individual who visited the health facility. They obtain these details from the register to locate the patient in the field to assess customer satisfaction and feedback from patient. If they are unable to locate the patient at the specified address—or if the patient has not used the services in relation to the same visit as documented—this becomes an issue. This can create conflict between the verification agent and the health care provider.

The verification agent will review to ensure that what is declared in align with what is being verified. However, if there are any inconsistency in the reporting of up to 10% (known as error margin) for the specific indicator, the health facility is likely to lose the PBF bonus for that indicator for the reporting period. This is challenging for some health facilities, which have lost substantial sums of money because of this error margin. This error margin can be because of but not limited to a counting error, poor data entry for example, 100 consultations being counted as 80, or 100 registered as 120, and this has significant implications. It also results in a loss of data regarding the true workload, leaving poor quality data, and the verification process is costly. As some attempt to cheat the system, a rigorous verification mechanism was put in place. Some providers expressed concerns about the verification process, as they felt it might be affecting the quality scoring as they do not appreciate the random selection of patient for community feedback to evaluate the quality as they believed some of the patient can be biased in their reporting. In addition, before PBF, some facilities had only one register. They registered the numbers of beds, consultations, children, men, and rate of hospitalization, with everything documented in one register. With PBF, a register is needed for each activity, and some facilities find this obligation cumbersome.

5.6.4 Language Translation

Health providers reported challenges with the quality assessment checklist which was translated from the French language into English --and there were incorrect translations. This was related to some of the equipment, and they have been penalized for over two years until recently when one of the reviewers looked at it carefully and it was observed that the issue was related to the way the indicator was translated and not necessarily that the health facility did not have the equipment. This point was equally raised by community health workers during the focus group discussions.

5.6.5 Business Plans and Indices Tools

Business plans must be up to date, adhering to the regulations of the project, with a minimum quality assessment score of above 50% if the contract is to be renewed. The rules are particularly strict for facilities that have had PBF for some time, with newer facilities usually given some time to meet quality expectations. It is not sufficient for a health facility to simply bring a business plan and sign a contract. This presentation of the indices tool and the business plan make the health facility more transparent, and some facilities find this challenging because it exposes certain details that were previously kept private. If the health facilities are unable to provide their indices tools, this suggests that they are hiding something from the public and, as a result, there will be no contract. Some of the health facilities reported that there were delays in receiving feedback from the PBF team on their business plans, and without the business plans, they could not proceed implementation activities for the following quarters. Another great challenge is the development of the business plan, respondents suggested that the quarterly production is not effective and would be better to have it semiannually given the delay in reviewing the plan and expectations.

5.6.6 Escalating Conflict

Some verification agents have been attacked during their verification processes, with reports destroyed and some agents even threatened and held against their will for several hours. This general atmosphere has made verification very difficult. Even going into the field for coaching has become very challenging. It was also reported, from another perspective, that in the absence of PBF in this region—and due to the

war—some health facilities have been burnt down and some closed. With the escalating conflict the equity scores were adjusted to reflect the need and situation of the region. Internally displaced persons can get access to services under the poor and vulnerable category.

5.7 Decentralization Facilitates Implementation, as Reported by Respondents

5.7.1 Autonomy

One participant reported that,

“The inception of PBF was grounded in autonomy, which is at the center of decentralization. Therefore, power is devolved to the lowest level—that is, autonomy—thus PBF serves decentralization.” (Stakeholder)

This decentralization allows the health facilities to be autonomous, which facilitates their work. This was reported primarily in the context of recruitment, participation and decision making, including the right to recruit staff without going through the regional delegate. Facilities can use these protocols, or they can enlist the help of the district medical officer, if necessary, to ensure authentication of certificates. This was reported as a major benefit of the decentralization.

5.7.2 Equipment

The health facilities used funds generated locally to acquire equipment. They no longer needed to write to central administration to request a microscope and then wait for a year or two for the equipment to arrive. In the past, when equipment was broken, it was necessary to send a letter to central administration to arrange repairs; and before the new equipment arrived, a patient could get worse, or the health facility might become frustrated and choose to stop offering certain services. One participant responded that,

“There is a ministerial text giving the facility full authority to use funds generated locally to buy equipment and to renovate their buildings without bottlenecks in bureaucracy, as well as to buy drugs and other lab reagents. That is the decentralization already involved in the process.”

They reported that the only domain still facing problems is that of the management of drugs. The health facilities do not have the authority to buy drugs, sell them, and plow the profits back into their facilities where they are needed.

5.7.3 Community Health Workers and Home Visits

PBF has provided avenues for contracts with CHWs that were not previously available. CHWs work directly with the community, and their role is critical in care delivery. PBF contracts motivate CHWs in their work because they provide indicators to be met, putting them in an active position and creating financial motivation. In addition, women and the wider community can make their voices heard and share their expectations, using a feedback mechanism that promotes quality improvement. For example, women can press for the facilities to include family-planning issues in their business plans, insisting that they are incorporated into indicators for CHWs and health facilities. In this way, women are empowered. Underserved populations are identified and given a voice, and their needs can be more easily addressed when they are incorporated into business plans and developed into indicators.

5.7.4 Improved Quality Standards

There is increased competition amongst health facilities in improving quality standards to stimulate demand. Some health facility administrators are using this as a mechanism to caution against poor communication attitude towards patient:

“Before now, we did not have so many private facilities around as at now, so we can have about an average of 25 birth deliveries per month but there are some months that it could reach up to sixty. So, with the stiff competition now, I think I can say our average deliveries has reduced. But they are a lot of things we are doing now to stay on top. I cannot really say if it’s because of the PBF program that the competition has increased because I do not know but we have what we are doing to keep up with these private facilities. We caution the mid wives whenever there is a complaint against them that they risk losing their PBF motivation if they do not change their attitudes, another complain was about the limited private ward, so we are now working on that”
(HCW, public facility)

Finally, looking back before PBF, the providers experiences reveled that there are some remarkable and drastic changes. The health providers were very pleased that someone had come to interview them and to inquire about the challenges that they had been facing since the

introduction of the policy, as they believed that their voices needed to be heard to inform policy implementation challenges.

6. Discussion

The findings of this study revealed that PBF has played a role in the decentralization of the health sector and its budget. Based on providers experiences, PBF has improved on the quality of care, motivated providers, and helped with resource allocation. It also has the potential to reach the poor and vulnerable. However, delays in payment are an important factor that affects the smooth implementation of PBF. The delays reported by providers were very demotivating and likely to affect the care provided to the poor and vulnerable [13]. Based on information available at the national and district level in Cameroon, PBF has helped to improve some aspects of the health budget, with substantial funds now directed toward the operational level (districts), thereby increasing autonomy and empowering health facilities. This increased in autonomy reflect on improved governance arrangement.

Drawing from the PA theory, there were experiences of tension in the transitioning process between the principal and the agent(providers) as reported by administrators and this tension is still ongoing with bureaucratic bottleneck at the central level affecting the smooth implementation of some of the PBF practices.

There is some information asymmetry between the CHW in this context is the agent who receives a compensation for doing the task as assigned by the principal who is the health administrator. The situation between the CHW and the health administrators can be reflected in the PA theory on information asymmetric where the CHW understand the community better than the nurses and health team and they are the ones that will lead the nurses to get access to the households however, they are not satisfied with what they get and, in some instances, they refused to adhere to the task until their request was considered. Also, there may be potential for conflict between the verifying agent and the health facility.

6.1 Sustainability Considerations

Respondents perceived the introduction of PBF in the context of universal health coverage. They believe the government is making efforts and they see PBF as one of the front lines for universal health coverage. The Ministry of Public Health has established policies stating that PBF should be implemented in all health facilities (private, public, and confessional), without discrimination. The regulatory body is responsible for the accreditation of facilities after successful renewals of contracts over a period of three trimesters. This accreditation informs the public that the quality of health care offered by this facility is good. Therefore, facilities that work hard to improve their quality receive more clients and more money. Facilities that do not meet the quality standards will be penalized after coaching and re-coaching, and they will be given the option of restarting the PBF as a pilot study. A small number of health facilities have been through this process. Some were advised to benchmark with other facilities that were performing well to gain an understanding of how they could improve their performance. This benchmarking approach and option of restarting as a pilot has helped some facilities to re-enroll, after previously leaving the PBF scheme. Facilities that are unable to meet the quality score can undergo coaching. If this failure persists for a long period, it may lead to some regulatory sanctions.

Providers reported that the sustainability of PBF greatly depends on political will, and they perceived it not from limitation of budget, but the will to fully incorporate the policy at all levels. The first step is the re allocation of the budget to ensure a reasonable amount is allocated to the operational level. This was perceived as an important policy change to support sustainability. The respondents reported that the government is making gradual changes to the input reform budget, introducing the PBF budget to ensure the sustainability of the system toward achieving universal health coverage. This process was piloted in 2017 in the littoral and eastern regions which links to how the implementation was rolled out. There are still issues with the structures in place, given the corrupt nature of the system and some regions do not seem to have the capacity to meet expectations and may require some time to establish the necessary structures. Most especially, in the phase of the constant delay in payment which they perceived as an issue within the public financial management system at the central level. Providers believed that

regulators should be given their full autonomy and reduce administrative and/or financial bottlenecks which tends to distort the smooth implementation of activities.

7. Strengths and Limitations

This study was limited to the southwest region experiences of health care providers including focus group discussions with CHW. Though the previous master's thesis was conducted in the northwest region the responses provide useful information about the previous structures and previous experiences and the changes in relation to improved motivation and performance. As such, the findings may not reflect experiences in other regions. Instead, however, the findings provide an overview of the implementation challenges and perspectives of providers who have engaged with both the old system and the new PBF system which is strength as this is the first study to examine this aspect. The conflict is also a limitation in relation to accessing health facilities, but this did not have any effect on their experiences before and after PBF.

8. Conclusions

PBF is a national strategy for achieving universal health coverage in Cameroon, and the experiences of providers provide a vital guide for national policy. The introduction of PBF has provided positive changes to providers quality of care when compared to the previous system. The reallocation of budget is important, if well-managed. Addressing the delays in PBF payments will help to overcome the challenges to implementation and provide opportunities for health facilities to be more efficient and better improve on their performance.

Contributions: MN conceived the idea for the paper, conducted data collection, analysis, and wrote the original draft of the manuscript. SY and JL supervised the methodology, analysis and critically revised the manuscript. RD, RP, and RG critically revised the manuscript and provided feedback. All authors reviewed and agreed on the final version of the manuscript.

Acknowledgement: Thanks to School of Epidemiology and Public Health and Mobility bursary at Ottawa University and my supervisors for financial support to facilitate data collection. We would like to thank the district health team, health administrators from the participating districts, the PBF regional office for southwest region and research assistants who assisted in data collection.

Funding: This study received partial financial support from thesis supervisors to facilitate data collection

Competing Interest: None declared

Data Availability: Data relevant for the study is included and/or attached as supplementary material

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Figure 8.1. Maternity extension partially built with PBF bonus at public health facility, Buea



Photo credit: Miriam

Chapter 9

Discussion and Conclusions

1. Integrated Discussion

In this dissertation I have investigated the effect of performance-based financing in reducing out-of-pocket expenses intended to improve access to selected maternal health services in sub-Saharan Africa -- which constitutes one of the PBF equity elements. This enabled an overview of the global picture on this equity designed element and the potential effect in enhancing equitable access. Then, I assessed how the PBF equity elements is defined and implemented in Cameroon with a focus on selected maternal health services at the health facility and community level—and explored the experiences of health care providers with a new health reform -from a supply side perspective and the potential for sustainability.

Given the heterogenous nature of health care delivery in Cameroon and limitation in the consideration of this heterogeneity in the reporting of the PBF impact evaluation for Cameroon [1]. I designed a before-and-after studies to get a broader understanding from the outset on the interplay in the implementation of the equity elements from both a supply and demand side perspective, and across health sectors, taking into consideration the role of contextual and individual characteristics in improving access and utilization for maternal health services [2,3]. Thus, the components of the research reported in Chapters 2-6 was designed to build on one another to enable a cumulative understanding, broader perspectives and triangulation of findings taken into consideration individual and contextual characteristics from both demand and supply side across health sector and districts. The findings inform the data and interpretation of the implementation of equity elements at health facility and community levels (Chapter 7). Chapter 8 provides an overview of experiences of health professionals from a supply side perspective in implementing PBF and the potential implications on the sustainability of the equity elements [4].

In this final chapter, I present the major findings and their policy implications, summarizing the key findings of each chapter and challenges. I discuss how the PBF equity elements (presented in chapter

1) are reflected in the context of Cameroon with a focus on four overarching findings; (1) the role of decentralization in the implementation of the PBF equity strategies; (2) the major challenge of the delay in payment of PBF incentives and the impact on the equity elements; (3) the introduction of home visits and the potential impact in enhancing equitable access and utilization of maternal health services; and (4) the potential challenges in the sustainability of the PBF equity strategy towards achieving universal health coverage. I present the implications of the research findings on the implementation of the PBF equity strategies in Cameroon. I draw on this to consider methodological challenges and broader contributions to PBF and its equity policy.

2. Summary of Research Findings

Given the paucity of research studying how the PBF equity element is defined and implemented in various contexts [5], the goal of this study was to examine the PBF equity elements in improving access to maternal health services in Cameroon. Given that Cameroon has adopted PBF policy as a strategy for universal health coverage, there is limited information on how these equity elements are defined and implemented amongst the PBF community in general [5] and in Cameroon. Consistent with this policy adoption and the need for research on PBF equity elements, I developed the thesis objectives to examine the PBF equity strategies to gain a broader understanding of the approaches in implementing PBF equity elements, the system's gaps and failures in the context of antenatal care and skilled birth delivery with a focus on the poor and vulnerable population at the community and health facility level to inform national policies towards achieving universal health care coverage and the PBF community at large.

The ultimate goal of including equity elements in the PBF design is to ensure that the poorest populations can access services and are not left behind. Given that most of the PBF program is focused on maternal health services, from a global picture, one can say that the PBF equity elements are designed to focus on enhancing access and utilization of maternal services amongst the poor and the most vulnerable as defined in chapter 1 table 1-1. Thus, the overall goal of this study was to examine how these PBF

equity elements are implemented and defined at the facility and individual levels to enhance access and utilization of selected maternal health services amongst the poor and vulnerable in Cameroon.

Therefore, I first conducted a systematic review of the literature to investigate the effect of PBF on out-of-pocket expenses (OOP) as a mediator of change in improving access and the use of selected maternal health services in sub-Saharan Africa (protocol, Chapter 2; systematic review, Chapter 3) [6,7]. One of the PBF equity strategies listed in Table 1-1 (Chapter 1) is subsidizing user fees to reduce OOP expenses to stimulate demand and increase coverage and access [8]. Additionally, OOP expenses are an important equity indicator with a direct and indirect impact across the six equity strategies listed in Table 1-1. Moreover, the poor and vulnerable populations are assumed to be responsive to changes in cost which can stimulate demand for services amongst this group [9-11]. The key findings of the systematic review were mixed – indicating that PBF was a positive mediator in eliminating OOP expenses in improving access to skilled birth delivery in Tanzania amongst the poor, but not in Malawi, Burkina Faso, or Cameroon [7]. This systematic review also provides insights into the way in which PBF strategies can induced effects on OOP expenses as a mediator of change in the use of maternal services [7]. In addition, the findings indicate that poor implementation approaches and payment delays can potentially demotivate health providers from making additional efforts to reduce OOP expenses. This will probably not stimulate demand from the poor, impairing intended efforts to expand coverage and address inequities [7].

The main challenge in synthesizing the evidence was the poor reporting of effect estimates and the lack of data disaggregation and heterogeneity in the presentation of results. An important methodological issue is that none of the studies provided a definition of the poor in the context of PBF to guide an understanding of existing applications or definitions of the PBF implementation of the equity elements. This justifies the main objective of this dissertation and further established the need to understand how the equity elements is defined and implemented with a focus on Cameroon.

In order to obtain a broader and more comprehensive understanding of how the PBF equity elements is defined and implemented in Cameroon, I designed a before-and-after study to address some of the limitations of the results of the PBF impact evaluation (of 2017) and to gain a better picture of the

effect across sectors [2]. Considering PBF as a behavior change intervention, the before-and-after study aimed to examine whether PBF resulted in any change in cost across sectors, reveal the limitations of average effects generated by impact evaluation [12], and understand differences across sectors. The key findings of this component of my work (chapter 4) indicate that OOP expenses were reduced for X-ray laboratory test and medications during antenatal care visits and informal fees reduced significantly; this finding corroborates the results of the previous impact evaluation [1]. However, the findings indicates that as PBF strives to improve quality, there was an indirect effect on cost; the number of tests for the first ANC increased, inflating the cost [2]. Most private for-profit facilities tend to reduce their OOP prices to attract more patients in order to obtain equity incentives; however, the drop in prices by the private facilities did not make much difference in cost when compared across other facilities because private facilities had initially high prices [2]. Nevertheless, the motivation to lower prices was a step triggered by the PBF equity incentives, and for the first time, private for-profit facilities were providing services for free or at a subsidized rate for certain groups of the population considered poor and vulnerable to earn the equity incentives. But delays in the payment of PBF incentives were reported as a challenge in supporting services for the poor and vulnerable, especially in the private sector.

Considering that PBF aims at improving the quality of care which, in turn, has an effect on equity, I further explored, by means of a mixed methods study, whether there were any effects relating to the health-seeking behavior of women attending antenatal care and skilled birth delivery across sector. Considering that PBF is a behavior change mechanism, and improving quality and reducing cost can stimulate demand, especially amongst the poor, who are more responsive to price changes [9-11]. The key finding (Chapter 5) was that women reported some changes in the public facilities in relation to the quality of care, specifically in relation to communication and how the nurses interacted [3]. This experience was reported in comparison to the situation before PBF was implemented, and women reported that they would like to use the services again for delivery, although the quality of care was the most important factor in their choice of health facility for delivery followed by distance [3]. One of the key findings of this study reveal that reducing cost to stimulate demand without ensuring that health

providers attain minimum quality standards; this may not stimulate demand amongst the poor to use services as anticipated. For example, complexity regarding the issue of quality and distance was identified as a result of probing why shopping around for care, especially antenatal care, was an issue in Tiko district. This shopping around was reported to occur because poor practices of health providers in relation to privacy and confidentiality of patient's records [3] drove women to seek antenatal care outside their health area. Another noteworthy finding was that women who were using a health facility for ANC visits and traditional birth attendants during delivery reported that the length of stay in the health facility affected their health-seeking behavior in using traditional birth attendants during delivery [3].

I had planned to conduct an interrupted time series analysis to assess the trend of antenatal care use over time amongst poor and vulnerable and non-poor and vulnerable. However, due to poor data and record-keeping, this was infeasible as the quality of the data was poor and unreliable. Instead, due to this poor data availability, I collected data across the three data sources to assess the role of PBF in improving the quality and coverage of data and to report on the data gap observed in the field and the impact towards achieving UHC. The key observation was poor record-keeping across all health facilities, and despite the rigorous quality control for PBF, there were some limitations in how PBF collects data especially for ANC visits [13]. Chapter 6 also highlights the impact of civil conflict on data collection and reporting.

Chapter 7 then examines the definition of the equity elements and how they are implemented at the health facility and community in the context of ANC and skilled birth delivery [14]. In this chapter, I have developed a working framework informed by the findings from the work reported in Chapters 3, 4, and 5 and findings from the qualitative data. This framework (and table 7.7) serves as a guideline for research, especially to guide future data collection in examining the differential effect [14]. This chapter builds on the previous chapters [2,3,4], focusing on limitations and classifications in the findings concerning the definition of poor and vulnerable and potential heterogeneity in care across health sectors in Cameroon. Key findings of this chapter include the subjective definition of poor, which may not align with the scale used in defining income quintiles and may lead to missed classification, role of decentralization in the implementation of the equity elements, introduction of home visits and the impact

on access, structural and contextual challenges in the implementation process and delays in PBF payment of incentives which had a negative relationship in the provision of services for the poor and vulnerable especially in the private sector.

Last, I investigated health care providers' experiences before and after PBF (Chapter 8). This was based on the concept that PBF has been adopted as a national policy and the identification and validation of poor and vulnerable is mostly at the discretion of the health facility. In addition, the sustainability of the PBF equity elements also depends on the sustainability of the PBF program and understanding the experiences of the main actors and agent in the implementation process would provide a broader understanding and perspectives of ways to address potential gaps and limitations taking into consideration the perspectives of the main actors and stakeholders engaged in the process. In this light, I designed this component of work to align with my master's study which I conducted on providers' motivation in 2007 before the implementation of PBF. Ten years after, Cameroon adopted PBF as a national strategy and a mechanism to stimulate motivational behaviors of health care providers. Therefore, the chapter focused on the experiences of health providers and stakeholders who had work in the system before and after PBF to understand what the main actors thought and the potential sustainability of the program, especially as the sustainability of the PBF program will also determine that of the equity elements and strategies. The key findings indicate some important policy changes experienced by health care providers due to the decentralization process [4]. Despite their challenges and the delay in payment, which appeared to be the main challenge affecting most of the other implementation aspects, health providers preferred to stay within the PBF system rather than return to the old structures.

2.1 Understanding PBF Equity Strategies in Cameroon Towards Achieving Universal Health Coverage

PBF is a reform strategy with a package of reforms, including an allocation of resources mechanism, autonomy of health facilities, separation of functions, and decentralization of decision-making, with the aim to strengthen the health system and improve the quality of care and access to health care services

[15,16]. PBF has instruments to address equity in the health system by allocating resources for people with greater needs. To ensure the same level of performance, health facilities in rural and poor areas receive more resources than those in urban and less poor areas. This makes it possible for health facilities to reduce their costs but still make money from PBF to cover their services. There are indicators specifically for the poor. If the health facility provides those services to the poor free of charge, the reward is four times the amount usually paid for that service, helping the health facility care for the poorest in their region.

This equity incentive in the PBF system also reinforces administrative and managerial lines that regulate the efficiency of the facility's management by providing health facilities with the means to acquire and provide services for people at almost the same price as other facilities. Moreover, it is possible to increase the allocative efficiency of the facilities and institutions based on the cost of acquisition and minimize the effect of distance and the challenges involved in acquiring the commodity. This ensures health facilities do not transfer the extra cost incurred to the consumers.

Out-of-pocket payment is a risk in that it increases maternal morbidity and mortality in Cameroon and other sub-Saharan African countries. Women are exposed to death not because their lives cannot be saved but because they cannot afford the services when they need them most. The innovative approach of PBF equity policies for reducing OOP expenses eases access and use of services in certain contexts by eliminating institutional and operational barriers at the health facility level. However, access to and use of maternal health services depends on many factors, as described in the Andersen behavioral model [17], which can be considered as demand side characteristics.

From a supply perspective, with the primary objective of improving quality of care, the PBF equity elements are designed to incentivize providers to stimulate demand with a focus on the poor and vulnerable population, assumed to be more responsive to changes in cost and quality. However, access to maternal health services goes beyond improving quality or reducing cost. There are other underlying social determinants of health characteristics, which in the context of the Andersen behavioral model can be summarized as individual and contextual characteristics [17]. These contextual and individual

characteristics interplay to determine access, especially for the poor and vulnerable. However, an important limitation of the PBF equity design is the focus on incentives for user fees to create demand without considering other important contextual social determinants of health that stimulate demand.

2.1.1 The Role of Decentralization and PBF Equity Strategies Towards Achieving UHC

PBF has introduced important policy changes in the decentralization of the health system in Cameroon, as reported by health providers. However, most importantly, providers perceived PBF as motivational, although payment delays hinder smooth implementation. Providers prefer the PBF system to the centralized system. It is noteworthy that the inclusion of the poor and vulnerable, as reported by providers and some women, is an innovative strategy in Cameroon [4]. As reported across all health facilities, this did not exist before PBF, which has led to the provision of services to certain groups of the population that would otherwise not have benefitted from the services given the previous structures. Additionally, the classification of internally displaced people within the category of poor and vulnerable provides opportunities for displaced people to obtain coverage for certain services. All these benefits would have been impossible in the previous system, as reported by participants. Home visits were specifically noted; they have expanded coverage since the identification of the poor and vulnerable [4].

This decentralization process has facilitated the provision of services to the poor and vulnerable, which existed previously in theory at regional hospitals [4,14]. However, with bureaucratic bottlenecks, the poor and vulnerable are still the ones to suffer; health facilities and administrators reported the delay in payment to have an impact on the way care is delivered to this population because health facilities evaluate the cost and benefit over time given the existing financing mechanism that relies on OOP expenses. In addition, this delay in payment may encourage some facilities to engaged into private practice, which PBF incentives have reduced. Therefore, the delay in payment means health providers will engage in practices that the PBF scheme is intended to address. As noted by Renmans et al. 2016 in a P-A relationship, the breadth of governance arrangements also determines the success of a PBF scheme [16]. Despite decentralization, there are still bureaucratic bottlenecks that inhibit smooth implementation.

2.1.2 The Introduction of Home Visits and the Impact of Enhancing Equitable Access to Maternal Health Services

PBF introduced home visits, which had not previously been carried out. This strategy helps in identifying households that need services as a way of ensuring no one is left out, creating demand, and addressing information barriers [8]. The introduction of home visits has resulted in important changes at the community and health facility levels. At the community level, households are more engaged with the health system and are more aware of the services provided by the health facility to their community. At the health facility level, there is greater recognition of the community's need and an understanding of the community the facility serves [4,14]. In the previous system, regional hospitals were responsible for providing services to the poor, and health facilities could refer individuals to them. However, this was more theory than practice [14]. With the introduction of PBF equity strategies, all health facilities are expected to provide services to the poor and vulnerable as a way to expand coverage and use of maternal services among the poor. However, the subjective approach in identifying the poor and vulnerable and using an objective scale in the assessment can potentially generate misclassification [3,14]. There is a need for a contextual objective assessment for identifying the poor and vulnerable in order to provide an objective assessment of the effect of the equity element in making a difference in their lives and to enhance equity. This study did not assess whether this innovative strategy has a differential effect on the poor but established the groundwork for assessing this in future research and provided directions on the nature of data to be collected. Thus, as a follow up to this dissertation, I plan to conduct a quantitative study to assess the differential effect on the poor informed by the findings of this dissertation.

2.1.3 Delay in Payment of PBF Incentives and the Impact on Equity Elements

Delay in payment is an important challenge that affects the implementation of PBF and its equity elements. For every challenge to the implementation of an intervention, the poor and vulnerable are the most affected. In Cameroon, the high OOP expenses impede the effective implementation of the equity elements. In addition, the heterogeneous nature of health care delivery in Cameroon is problematic. First,

health care is delivered by public, private, confessional, para-public and traditional sectors, all of which play an important role in the delivery of maternal health services, and the cost for maternal care services varies by these sectors. Second, the quality of care provided also varies by sector --technical, content quality, and other structural and contextual issues.

This heterogenous nature of health care is an important contextual element that requires consideration because the primary goal of PBF is to improve quality of care. These health sectors perceive or approach quality of care differently and are not at the same quality standard. For example, this aspect of the quality of care has long been an issue in the public sector vis-à-vis the private and confessional sectors. Women reported some practice changes by nurses and midwives working in public facilities, but women are still attracted more to private and confessional facilities. This limits the way private and confessional facilities provide services for the poor and vulnerable especially with the regular delay in payment, which is a detriment in expanding coverage. Second, cost is an issue in confessional and private facilities despite the effort to reduce costs through PBF incentives. The cost is still high relative to their purchasing power because of high OOP expenses, and most importantly, improvement in quality indicators inflates the cost for the first ANC visit. Though cost was not reported as having a greater impact on women's choice of skilled birth delivery at a health facility, as opposed to quality of care, OOP expenses for maternal health services remains an important policy question in Cameroon's health system if the country wants to achieve UHC.

2.1.4 The Challenge of Sustaining the PBF Equity Strategy

Sustaining equity strategies greatly depend on sustaining the PBF program in general. Based on the stages in the scaling up of evidence from the generation of evidence to the pilot project, adoption when the pilot project is transformed into a programme and institutionalization when the program becomes part of the policy for example financial strategies, existing legislations, and public financial management and then expansion to extend coverage within the system at all levels that is central regional and district level [21]. It is evident that Cameroon is at the institutionalized stage. However, important challenges exist with payment delays, which relate to the public financial management system and the central administration

not ensuring best practices and effective implementation of the policy. Important questions beyond PBF are how to move from passive to strategic purchasing to achieve UHC and how to design PBF programs that support strategic purchasing that link with other key reforms like decentralization, provider and purchaser autonomy, and human resources [20].

2.2 Policy Implications of PBF Equity Strategies in Cameroon and Sub-Saharan Africa

PBF is intended to stimulate a fundamental shift toward strengthening health systems and improving health care in the most vulnerable populations in LMIC, with a focus on maternal and child health services [15,16]. PBF is continuously changing in response to methodological challenges and the experiences of an increasing number of countries engaged in PBF [8,16]. These changes and methodological issues include the design, implementation, quality approaches, equity, and demand-side interventions and extend to the secondary care level [8].

PBF is part of a mixed system of incentives, that is, PBF does not constitute the base payment for health providers but is an add-on incentive. For this reason, we should be thoughtful about what a payment add-on method will achieve. PBF comes with other health-system strengthening designs and should be aligned with the rest of the payment system [20]. It is important to consider PBF as an add-on and evaluate how the broader system works rather than looking at PBF in isolation. For example, in this dissertation, while examining the equity design elements, it was reported that PBF has strengthened the existing program for subsidizing the poor and vulnerable—and the program has extended to all health facilities, which was initially implemented only at the regional health facilities. However, delays in PBF payment hamper the effective implementation of this strategy.

PBF includes indicators of health-system benefits and has shifted the focus from budget for inputs to data-driven output, which is very important. This can change a system culture in relation to data collection, but we cannot underestimate what an add-on can change in the system culture [20]. If PBF is seen as an add-on payment, then we have to recognize that a successful PBF should be accompanied by other interventions to strengthen the health system.

PBF was not designed for fragile states, but it appears to be working in fragile states. PBF programs do not provide enough funding to run the entire health system so other sources of funding are needed.

The focus on measuring quality and linking payment to data can promote investment in the health management information system in Cameroon and other sub-Saharan African countries in the area of maternal mortality and lead to accurate and actionable data [20]. The findings of chapter 6 strongly point in this direction, taking into consideration that PBF data currently serve as the most reliable data when compared with the way the DHIS2 data are collected and the record keeping mechanism at health facilities (see Fig. 6.9 and Appendix T). Moreover, considering that verification is an important component in the PBF system, achieving UHC requires reliable, relevant, timely and actionable data that are highly disaggregated. The current DHIS2 platform may not effectively address this data issue, and there is a need for countries to invest in their health management information systems for maternal health services so that reliable and consistent data can be collected. This will help reduce some of the challenges in the verification process, minimize the cost incurred in the verification process, reduce delay in payments, improve data transparency and help identify areas for intervention.

An important component is this gradual transformation of mindsets and the financing flow into the health facility in Cameroon. PBF can be seen as a behavior change mechanism as health providers gradually shift their mindsets about the way they deliver care. For example, some nurses reported that the workload has increased but was reported by most nurses as a task that they normally should do but previously ignored. Hence, they viewed it as a workload.

In some sub-Saharan Africa, based on the systematic review, PBF facilitated the removal of operational barriers to enhance access [11], but it was not able to improve access for the poor in most countries [1,9,10] despite user fee exemptions and subsidizing OOP expenses—the effect on the poorest quintile was not substantial. It may be argued that other direct facility financing approaches may be cost effective than PBF in terms of the value of money. However, this has not been well studied, and based on providers' responses in Cameroon, most of the resources are concentrated centrally where it is not

needed. It could also be argued that the scale used to define poor in the various countries does not align with the way PBF defines poor and vulnerable, which likely introduces misclassification [3]. On the other hand, it is evident that subsidizing user fees to reduce the cost of maternal services benefits those in the middle-income group because the cost becomes much more affordable for them [9–11].

Given the limited evidence of the impact of PBF on equity in sub-Saharan Africa), more research on how the implementation of the equity elements is influenced by contextual characteristics is needed. Improving quality of care with the goal of improving access to maternal services without considering the underlining social and cultural determinants of health will not effectively stimulate demand. PBF may not be the most suitable policy in certain contexts to enhance equity in access among the poor and vulnerable. It is important for each country to objectively assess the gaps in their health system and understand the needs of the population to be able to identify what aspects of PBF would work in their context.

2.3 Applying the PA Theory to the PBF Equity Strategies in Cameroon

This dissertation identifies various levels of PA relationships, including hospital administrator/health providers, verification/health facility, health facility/patient, and health facility/CHW [16]. There are several actors involved in PBF and these are interlinked in PA theory [16] as seen in the CHW/provider relationship. In this dissertation, I consider poor and vulnerable patients as important because they are not only the beneficiaries but also the impact of the above actors in PA relationships can be evaluated based on the differences that their various tasks make in improving the lives of patients and the poor and vulnerable [16].

The design and implementation of PBF schemes differ depending on their contextual implementation. Therefore, it is important to assess a PBF scheme based on its context [15]. This dissertation presents an assessment of PBF equity elements in the context of Cameroon, drawing on a PA relationship. This following paragraph is discussed in line with the principles of PBF as defined in the introduction with a focus on four components: i) separation of functions, which is considered a part of governance, ii) matrix of indicators and quality measures, iii) monitoring arrangements, and iv) financial incentives and time schedules [12].

2.4 Governance Arrangement

Achieving UHC requires strong institutions, and PBF aims to improve institutional governance. Given that PBF is a supplement to an existing payment mechanism, an important policy change is the decentralization component where the operational level now receives more finances than previously. When power is devolved, lower management contributes to decision-making in the establishment. One principle of PBF is the segregation of functions. Everyone has their own function, and when everyone fulfills their function in a timely and in the expected manner, the entire system runs smoothly. Regulators are responsible for regulating health facilities, ensuring that the facilities have the appropriate documents and structure to guarantee quality care.

In Cameroon, PBF is marked by autonomy and decentralization, meaning power is devolved to the lowest level, making health facilities autonomous. Health facilities have the right to recruit staff locally. Additionally, health facilities use funds they generate locally to acquire equipment, for example, they do not need to request a microscope from central administration and wait a year for the equipment to arrive. A ministerial text gives the facility full authority to use funds generated locally to buy equipment and renovate buildings without bureaucracy bottlenecks, as well as buy drugs and other laboratory reagents. However, in managing drugs, health facilities do not have the authority to buy and sell drugs and reinvest the profits in their facilities as needed.

In a PA relationship, it is assumed that the health providers (agents) are better informed and giving them autonomy will increase their creativity and improve their strategies in achieving their predefined targets [16]. As reported in chapter 8, some facilities have improved their quality of care and increased the funds they raise. These facilities see PBF as icing on the cake. Some of these health facilities have taken advantages of PBF, which makes them social entrepreneurs. They see the benefits of embracing change and have used PBF incentives to construct and expand their health centers (see Fig. 8.1 and Appendix T) with recruits, whereas other facilities still face challenges regardless of what is provided. Making the necessary changes is challenging because the goal is to help change the engrained mindset concerning how health care is offered to the population.

2.5 Financial Incentive Payments and Time Schedules

This financial incentive is one of the most important components that requires careful consideration because it forms the basis of the PA theory [16]. Payment delays are an issue affecting specific functions in the implementation of PBF equity elements and the PBF program at large. When payments are made promptly, health facilities are motivated in their supervision and coaching sessions. Verification agents can verify data on time and send reports in promptly to initiate payments and ensure that payments are made on time. This segregation of functions—if well-managed, with everyone completing their tasks as expected—will have an impact on Cameroon’s health system. However, with the current delay in payments, demotivation exists, and this affects the way care is delivered to the poor and vulnerable. For example, in line with the PA relationship, CHWs reported a delay or no payment from their health facility. This effected home visits, given that the community will not receive the nurses without CHWs, CHW refused to accompany the nurses for home visit until an agreement was reached and their payment were guaranteed. On another note, facilities that have expanded their maternity facilities are unable to complete the construction in a timely manner (see Fig. 9.1). Some facilities had engaged in creative strategies to improve their care delivery, but these strategies are hampered by payment delays.

This delay was reported to be an issue in relation to the finance management structures, which reflects the fact that centrally, the principles of PBF have not been accepted. This explain how the health system was initially structured, which is why I employ the PA theory in this dissertation. Therefore, the extent of decentralization is limited [16], and this has implications for implementation. Financial incentive is central to the PA theory, and delays or unfairness in the distribution of incentives can jeopardize the PBF program in Cameroon [16, 19].

2.5 Matrix of Indicators and Quality Measures

The PBF team reported more than 39 indicators, with complementary registers for the poor and vulnerable for specific indicators (see Fig. 6.9 and Appendix T). The way the indicators are reported is problematic for intervention and to inform policy. For example, as reported in detail in chapter 6, PBF

does not disaggregate the number of ANC visits. The gap in reporting ANC doesn't provide information to help guide intervention strategies. It is important to monitor each ANC visit and identify the rationale for not attending up to four ANC visits, this will help direct implementation of the WHO-recommended eight ANC visits for a positive pregnancy [19]. Therefore, PBF team need to improve their strategy for identifying and reporting the indicators. Each ANC visit is important, and it is not clear if PBF is improving quality of ANC care by buying visits based on the timing of the ANC visit or on the number of ANC visits.

The PBF registers include claimed and verified columns for PAV and non-PAV, which is also an issue in assessing access because it does not provide a complete assessment. For example, the number of ANC that is reported by the health facility is recorded as claimed and the number that is confirmed based on a pre-defined criteria for verification for the incentive payments is recorded as validated. However, in the register, it is not clear if the difference between the claimed and verified data was due to poor documentation, counting error, or incomplete reporting to assess actual utilization of the specific indicators, and to provide directions on the specific intervention strategy to inform policy and practice. Therefore, it is important for the PBF team to document where the error is coming from to inform relevant intervention, if the error is based on counting, then the intervention is different, from poor data entry, etc. This is also relevant for skilled birth delivery. There may be a lack of understanding or differentiation in the variables—and the definition of indicators are not clear to those who enter the data and those who verify the records.

At a minimum, PBF has made some remarkable changes in the quality of care that is delivered both at the individual and health facility level. Women reported some changes in the way care was delivered though not all health providers have improved their attitude towards care delivery. At health facilities, providers' responses indicated gradual changes in their mindset especially in the way they perceived data and workload. The quality of data generated for indicators of maternal health has improved relative to the other sources of data, DHIS2, and the health facility register. The attitude of health

providers is gradually changing, and some of the health facilities are using this to motivate their staff to deliver quality care.

2.6 Monitoring Arrangements

From a management perspective, some health facilities enrolled into PBF and had limited staff which affected their workload, especially documentation, and registration of data was poor because collaboration among staff was lacking, and supervision was poor.

Operationally, supervision is subjective because indicators have not been mastered since most of the reviewers are not formally trained. Inadequate clinical decision making and inconsistency in how PBF verifiers are trained pose a substantial challenge. Some health facilities reported bias in the verification process, which is consistent with the PA relationship in line with conflict between health facilities and the verifiers [16].

An important issue is that indicators in the southwest and northwest regions are in French, and sometimes direct translation hinders proper implementation. Most of the indicators remain in French, hindering the smooth implementation of activities in the English region. This also creates conflict in interpretation and verification between the facility and the verifiers and supervision is subjective because some of the reviewers, who are not trained, have not mastered the indicators and sometimes change in the verifiers who are not yet experienced results in conflict.

This miscommunication in the verification of the indicators sometimes introduces conflict between the verifiers and the health facility, as reported in chapter 8. It is not clear if the problem is the lack of formal training of the clinical verifiers, poor documentation, interpretation of the indicators by the health facility, or poorly defined expectations in the indicators. Further research is needed to understand the nature of the training that is provided to PBF verifiers, the characteristics of the verifiers and observation of the verification process. Therefore, as suggested by the health providers, there is a need to engage health providers for a consensus discussion on the definition and interpretation of the indicators prior to validation because clinical definitions of diagnosis may not align with the way PBF has defined the indicators and trained its verifiers. Though I observed the verification process at two health facilities, it

was not sufficient to capture important nuances and challenges as my objective was not to focus on the verifiers.

2.7 Perverse Outcomes of PA Theories

There were several negative points reported in the literature that were also reported in the study in relation to rent seeking behaviors [16], which I discuss in this section in relation to Cameroon.

Gaming: It can be argued that PBF has huge administrative costs, and decentralization is not the only approach that could effectively institute change. However, it is also noteworthy that every system is different, and Cameroon is a typical centralized and corrupt system where most of the PBF perverse effects reported in the literature, such as gaming and increased work overload existed even in Cameroon even before PBF.

Cherry picking: The identification of PAV was initially assigned to quarter heads in the community. However, at the community level, the PBF verification team reported quarter heads who listed the names of their family members as PAV, therefore, ensuring services for them. This is a form of cherry picking and a manipulation of information. However, this was later addressed by the PBF team using other strategies, as discussed in chapter 7.

Task tradeoffs: The PBF verifiers also reported that facilities preferred to register only the new cases and not follow-up cases; facilities prefer to document follow-up cases only in the patient record notebook and not in the register. This is because PBF buys only new cases in the registers. Therefore, if a patient is diagnosed for a consultation and any follow-up consultation for the same diagnosis is not incentivized. However, if the patient is re-diagnosed for another issue, it is considered a new diagnosis. Thus, PBF buys diagnoses during consultation and not follow-up cases of previous diagnoses. However, PBF encourages facilities to document all cases both new and old, even if it does not buy the old cases.

From a behavioral change perspective, the literature has reported the above behaviors of PBF as a possible negative aspect of the policy in some contexts [19]. It should be noted that these attitudes existed in Cameroon and in other sub-Saharan African countries prior to PBF's implementation. In other words, PBF may exacerbate the behaviors but not necessarily introduce the behavior. In such context, PBF

programs should carefully investigate how the health system is structured to ensure when designing strategies that these perverse behaviors are minimized.

2.8 Socio-Political and Contextual Influences on the Study

The conflict situation in the SW region has affected the PBF implementation in various ways. Health facilities have been forced to close and some facilities in this process lost registers and some get burnt. PBF verifiers are facing challenging in implementing their task and they sometime get ambush, kidnapped and in the process, they also loose records. This has an impact on the data that is generated and also increased the equity incentives for this region by activating the emergency components of the PBF program, facilities get higher incentives due to the political situation. This civil conflict and the impact on data is an area that requires further research. This thesis could not assess this but an area of interest for further analysis using some of the available data gathered during the study.

Moving around, I saw many army and machine gun vehicles, indicating a war. On some days, I could not visit some health facilities due to gunshots and interruptions by armed groups and separatists. Nevertheless, I faced some challenges accessing some of the facilities; on some days, we had scheduled to visit some of the facilities with the research assistant, and this was not possible due to gunshots and unplanned interruptions. Any official visit from a top government official was an avenue for interruption of both parties. Movement was normal, but the atmosphere differed from that in Yaoundé, where I landed. I could deduce the difference, especially with the presence of armies, and, worse, on some days, I saw machine gun vehicles, suggesting a war environment, but activities continued as usual.

3. Limitations

The study was conducted in three districts of the 18 districts in the Southwest. This likely represents a limitation in generalizing the results to the entire Southwest region; however, based on the nature of the PBF equity elements, the findings may not differ much from other districts, although heterogeneity across sectors is observed.

Although not all health facilities were accessed due to the ongoing conflict, some of the facilities from which we could not collect secondary and primary data were low-performing facilities and usually in equity categories 1 and 2. However, the DHIS2 and PBF provided secondary data for all health facilities—this helps minimize this aspect. This study did not assess the differential effect of the PBF equity elements in accessing care but provides the direction for data collection, which is the next step of my research.

4. Methodological Challenges

The before-and-after study design was employed across objectives. Given that PBF has been implemented across all facilities, there was no control; however, it was challenging to identify women for the survey, especially in Buea and Limbe, where PBF was implemented in 2012. In attempting to obtain a broader in-depth perspective over time regarding exposure to the policy, there is also the challenge of identifying eligible participants, especially with the poor record-keeping. Specifically, Chapter 6 was designed for an interrupted time series analysis to gain an understanding of the utilization trend; however, due to poor record-keeping across health facilities, it was infeasible to conduct such an analysis. A few health facilities could not be accessed due to the ongoing conflict. These are extremely low-receiving health facilities, but this does not affect the generalization in each district. The systematic review was planned to include a meta-analysis; however, poor reporting of effect estimates was a limitation in achieving this objective.

5. Observations on Data Collection in the Field and Challenges

Some facilities had been affected by the conflict, and some had to transfer, so some of the files were missing. Some hospitals requested items before data collection, such as a ream of paper or soap. Some health facilities repeatedly postponed the data collection while others refused. In the Buea district, we (including the RAs) visited some facilities on several occasions, the conflict affected our movement on

some days, and we had to return from the health facility without collecting data due to gunshots, but we later succeeded on another day. This also increased the cost.

5.1 Exit Survey

Given that PBF was implemented in Buea and Limbe in 2012, it was slightly challenging to find women who gave birth before PBF and were either pregnant or had recently given birth. Therefore, it was easier to find such women who fitted the criteria in Tiko district because the district enrolled in PBF in 2018. However, there were many health facilities in Buea that enrolled in PBF in 2018, which would have provided an opportunity to obtain more eligible women. However, I observed that most of these facilities that enrolled in PBF in 2018 in Buea district were low-performing facilities, and their intake of women for antenatal care and skilled birth delivery was too low to meet the sample size given the limited time for data collection. Thus, more women were sampled from some health facilities than others. Thus, it was observed that while the impact evaluation randomized facilities into intervention and control, most of the health facilities included in the randomization for the PBF pilot study were the most used health facilities which are easily accessible (with category 4 and 5). The few facilities that were not included in the pilot studies (that enrolled in PBF in 2018) were either new health facilities or very low-performing facilities in terms of utilization. Therefore, some health facilities could not meet the required number of women for the survey and due to the current COVID-19 situation and their capacity. We recruited and matched by sector from health facilities with more women attending ANC and skilled birth delivery.

5.2 Interviews and FGD

Generally, data collection in the field involved challenges, such as visiting an office to interview a key informant on two occasions (scheduled) and not meeting them. A major difficulty encountered during the interviews and FGD was the refusal of the women who do not use health facility for delivery to be recorded on tape. The two women among those not using the facilities who finally agreed to speak with us was after I had sought permission from their husbands. Considering that they refused to be recorded, it

was a little challenging jotting down the responses and time consuming as we had to conduct member checking with them to ensure what we jotted reflected what they responded.

5.3 DHIS2

The district health information system DHIS2 data were also an issue, especially as the health facility data indicated poor quality and incompleteness, and these data were entered into DHIS2. Thus, PBF data appear to be the only reliable data to generate graphs or demonstrate utilization over time. Health facilities could not find their registers for some years; sometimes, they did not complete the data for several months.

5.4 Data Collection from Health Facilities

During this activity, we realized that most of the facilities across all the three districts faced serious challenges in record-keeping and lacked mastery in this. All the facilities across the four sectors, public, private for-profit, confessional, and para-public, lacked appropriate record storage facilities. This made it extremely challenging to obtain records and, consequently, data for some years. In some facilities in Tiko district, we could only obtain some maternity data due to the janitor having refused to obey orders to discard the records. The janitor had simply stored them neatly in one room at the health facility. Unfortunately, rats and frost destroyed much of the data.

Generally, all health facilities lacked appropriate storage spaces for their records. At the maternity department, for instance, we could find some records, but when we enquired where we could obtain those of the past 10 years, no one could give us a clear answer. The general response we received from most of the staff of the different facilities was that they were newly transferred to the facilities and had no idea where previous records were kept. However, one facility in Tiko district stood out in record-keeping – we could trace delivery records as far back as 2010. In Limbe district, most of the facilities only had records from 2015.

5.5 Data Entry

During data collection, we also noticed that most of the facilities had not mastered the data entry procedures. In some instances, the monthly number of clients was entered in the column for the yearly number of clients, making it challenging for the research team to determine the exact number of clients for the year. To overcome this challenge, we painstakingly counted the number of deliveries and ANC's page by page. We also realized that in most of the facilities across the three districts, monthly statistics were not recorded at the end of the month. For instance, the total number of normal deliveries, births before arrival, stillbirths, and skilled deliveries by cesarean section were not properly documented at the end of the month. In one of the facilities in Tiko, we realized that errors had been made at the end of the recording period, and even the PBF verifier did not notice the error until we notified them.

5.6 PBF Data

We also observed flaws in the PBF registers. Some of the registers had no margin for the yearly client number. This caused confusion with the numbering process. Moreover, unlike previously, where the Ministry of Public Health provided a monthly summary, PBF registers do not provide this. This further hinders facilities from entering monthly statistics, especially regarding ANC. However, some facilities were still using the Ministries' books for their monthly statistics, which facilitated data collection in these facilities. Regarding ANC record-keeping, especially monthly statistics, one facility in Tiko district adopted a new approach in 2019, which differed from the PBF ANC register; they kept a small ledger where they recorded monthly statistics on the total number of ANC visits. This greatly facilitated data collection.

6. Challenges in Collecting Data During the COVID-19 Pandemic

Collecting data during the pandemic was extremely challenging. The pandemic adversely affected my thesis, beginning when I was about to proceed with data collection. I was unable to travel due to the measures in place, and my trip was delayed as I waited to obtain my first dose of vaccine. Traveling with a mask for up to 12 hours was an unusual feeling and not without consequences. Upon arriving in

Cameroon, my first feeling was freedom; I was free coming from Canada with strict lock down measures and limited movements and could feel the mental stress disappear, like being released from a cage. I observed that people were not wearing their masks, as was the case in Canada, despite the government measures in place; however, all the offices respected the COVID-19 measures. Nevertheless, after leaving the office, it was business as usual, and people performed their normal activities with no obstructions. Although some wore masks, it appeared to be a personal choice rather than a regulation.

Upon my return to Canada, the COVID-19 entry regulation had changed, and the expectation was for all travelers to stay in a government-approved hotel for three nights before traveling to their destination. I booked a moderate hotel about \$300 that I could afford as a student; however, at the port of entry in Toronto, I was asked to rebook into one of the government-approved hotels. I was asked to either pay a fine or rebook into a government-approved hotel, and the cheapest was approximately 1,000 dollars. Arriving from data collection on the field, I had no money as a student. I could not afford the hotel, and I had to borrow the money from my sister to make the payment, which I could only pay back after some months.

7. Overall Conclusion and Recommendations

Equity is central and essential to the delivery of services to achieve universal health coverage. Universal health coverage advocates for access to essential quality health services that do not expose the user to any form of financial hardship [22]. This ensures continuous accessibility and use of essential services, particularly by the poor.

The effect of PBF on equity is mixed and varies by context and the effect on the poorest quintile was not substantial. However, the scale used to define poor in the various countries does not align with the way PBF defines poor and vulnerable, which likely may introduce misclassification [3]. On the other hand, it is evident that subsidizing user fees to reduce the cost of maternal services benefits those in the middle-income group because the cost becomes much more affordable for them [9–11].

The adoption of PBF in Cameroon is a step toward achieving universal health coverage with the recognition that UHC cannot survive in an institution without good governance. The PBF initiative is viewed as an entry point for universal health coverage to evaluate the level of preparedness of health facilities to embrace UHC in terms of quality of health care, production, good managerial skills, and financial management. However, due to administrative bottlenecks, the government is still to accept some of the established principles of PBF, which is a gateway to implementing UHC.

PBF is a national policy, but the central level at the Ministry of Public Health is not playing its role effectively as best practices and theories remain to be fully implemented. This has an impact in the way care is provided to the poor and vulnerable to enhance equity.

Addressing the high out of pocket expenses and quality of care has an impact on health seeking behavior of women and uptake of maternal health services. Given the heterogenous nature of health care delivery in Cameroon, cost and quality varies by sector and has an impact on health seeking behavior of women for maternal health services. Policy design and intervention for maternal health services should carefully take into consideration this contextual heterogeneity as it may influence how the intervention is implemented, especially in a context that depend on out-of-pocket expenses as the main financing mechanism. Interventions that are geared towards targeting out of pocket expenses should consider this heterogeneity more carefully because poor women may not necessarily benefit from such interventions if not well designed, taking into consideration that poor women are seeking for quality of care at a cost.

Community health workers should be provided continuous training as well as the verifiers and ensure there is a better understanding of poor and vulnerable and the processes are clearly defined and documented. This extends to the clinical verifiers and the health providers especially in defining the indicators and a need for a consensus in the definition of the indicators amongst all stakeholders involved.

The government should invest on data governance, data collection and record keeping at all levels. The high maternal mortality rate in Cameroon requires reliable, complete, and actionable data to help identify specific needs and areas for intervention and how to strategize for the intervention towards reducing maternal mortality. In addition, duplicating the DHIS2 for programs like PBF that are running at

a national scale without a proper mechanism to integrate the verified data into the national DHIS2 to strengthen the overall health management information system is not efficient, but rather parallels the existing structure. After verification of PBF data, the government should introduce interoperability platforms to ensure that verified data from PBF data base are pushed into the national DHIS2 system. This can be introduced to other similar programs that are running at a national scale, especially programs that generate data that are relevant to the national health management information system. This will also help control health facilities in their effort to collect reliable data and record keeping and the government can better monitor areas where there is need for data intervention.

There is a need to focus on improving the content of information on quality of care for antenatal care and skilled birth delivery. This is something that the system has failed to manage, and appropriate measures are needed to improve quality, especially in primary health care. This may not only require a simple check list of quality indicators and verification process as employed by the PBF system, but also a more rigorous procedure that incorporates continuous training and strict supervision. If there is a need for additional reinforcement, this may require (if necessary) a review of the curricula of medical students (especially nurses and midwives) trained in Cameroon. This is important because emphasising quality in practice at the level of PBF indicators and verifications without ensuring it is also emphasised in the mindset from the onset and the training programmes would be much like treating the symptoms of a disease without considering the cause.

Finally, health providers should be reminded to maintain the ethics of their profession and understand the implication of improving quality of care in care delivery. Patients have right to know about their care and should be treated with respect. The practice of talking rudely to women during delivery is a common phenomenon especially amongst female nurses in the public sector. Additionally, this attitude has been reported as one of the main factors that drives patient especially poor women from using public facilities to seek care in the private and confessional facilities, thus exposing them to financial burden. There is a need for a proper enforcement mechanism to be implemented at health facilities as a quality measure and

the government should work closely with the PBF quality team to introduce indicators or mechanism to monitor this attitude. Given the heterogenous nature of care delivery, quality and cost are important component for the government to review across all health sectors as they mobilize strategies towards achieving universal health coverage.

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Figure 9.1. Uncompleted maternity building extension from PBF bonus, Tiko



Photo credit: Valentine

Appendix A

Supplemental File: Out-of-Pocket for Administrators at Health Facilities, Adapted from USAID

Code Facility type	

	Administrators	
1	Facility type	(A) Public (B) Private (C) Confessional (D) Para-Public
2	Year enrolled into PBF	
3	Questions After PBF How much is the cost for ANC1 at your health facility?	
4	How much is the cost for ANC2 at your health facility?	
5	How is the cost for ANC 3 at your health facility?	
6	How is the cost for ANC 4 at your health facility?	
7	How much is the cost for echography at your health facility at your health facility?	
8	How much is the cost for normal delivery at your health facility?	
9	How much is the cost for C-section at your health facility?	
10	How much is the cost for iron medication for ANC at your health facility?	
11	How much is the cost for malaria medication (IPTp) for ANC at your health facility?	

12	How much is the cost for general consultation at your health facility during ANC (if different from any ANC cost)	
	Questions before PBF	
13	How much was the cost for ANC1 at your health facility before PBF?	
14	How much was the cost for ANC2 at your health facility before PBF?	
15	How much was the cost for laboratory test at your health facility for ANC3 before PBF?	
16	How is the cost for ANC 4 at your health facility	
17	How much was the cost for echography at your health facility before PBF?	
18	How much was the cost for normal delivery at your health facility before PBF?	
19	How much was the cost for C-section at your health facility before PBF	
20	How much was the cost for ion medications during antenatal care at your health facility before PBF?	
21	How much was the cost for malaria pills during antenatal care at your health facility before PBF?	
22	How much was the cost for consultation fees (if different from ANC cost) at your health facility before PBF?	

THANK YOU

Appendix B

Exit Survey on Health Seeking Behavior, Adapted from Andersen Model

Codes for Poor and vulnerable	PAV
Codes for non-poor and vulnerable	NPAV

1	Facility type	(E) Public (F) Private (G) Confessional (H) Para-Public
2	Year enrolled into PBF	
	Survey for Women	
3	How old are you?	
4	What is your highest level of education?	(A) No formal education (B) Primary (C) Secondary (D) High school (E) University
5	What is your employment status?	A) Employed for salary B) Self-employed C) Housewife D) Student E) Not working
6	What is your estimated household income per month?	(A) No income (B) Less than 30,000 CFA (C) 30,001-50,000 CFA (D) 50,001-70,000 CFA (E) 70,001+
7	Marital status	A) Married B) Divorced C) Widowed D) Single, never married
8	What is your Religion?	A) Christian B) Muslim C) Presbyterian D) Baptist E) Other-specify.....
9	Equity status	A) Poor and vulnerable

		B) Non poor and vulnerable
	Questions adapted from Andersen model	
10	Where did you seek care for ANC1?	A) Public B) Private C) Confessional D) Para-Public
11	Where did you seek care for ANC2, ANC3, ANC4?	A) Public B) Private C) Confessional D) Para-Public
12	Where did you seek care for your echography?	A) Public B) Private C) Confessional D) Para-Public
13	Was your echography done in the same facility as your ANC?	(A) Yes (B) No
14	If No, any reason?	
15	Did you deliver in the same facility where you attended ANC?	(A) Yes (B) No (C) I don't know
16	Any reason for your choice?	
17	Was it easier for you to pay for your ANC 1	(A) Yes (B) No (C) I don't
18	Which was much easier to pay for ANC1 including laboratory test, the previous or current pregnancy?	A) Previous B) Current C) Can't remember
19	Any reason for your response?	
20	Was it easier to pay for your ANC2-4 for your current pregnancy compared to previous?	A) Yes B) No C) I don't know
21	Was it easier to pay for skilled delivery for your current pregnancy compared to previous?	(A) Yes (B) No (C) I don't know
22	Was it easier to pay for your C-section (if delivered via C-section)	(A) Yes (B) No (C) I don't know
	Contextual	(D)
23	What is the distance to your health facility where you seek care for ANC?	A) Trekking distance B) Far C) Near
24	Do you have any reason for your choice of health facility for ANC?	(A) Yes (B) No

		(C) Don't know
25	Reason?	(A) Distance (B) Cost (C) Quality of care provided (D) No reason
26	Is there any other health facility beside your house other than this facility?	(A) Yes (B) No (C) I don't know
	Outcome	(D)
27	Are you happy with the care you received for your ANC visit?	(A) Yes (B) No (C) I don't know
28	Are you happy with the care you received for your skilled birth delivery?	(A) Yes (B) No (C) I don't know
29	If you were pregnant again, would you use the same facility for ANC visits	(A) Yes (B) No (C) I don't know
30	Any reason for your response?	
31	If you were pregnant again, would you use the same facility for your skilled birth delivery?	(A) Yes (B) No (C) I don't know
32	Any reason for your response?	
33	Please rate the quality of care in your own words	(A) Excellent (B) Very good (C) Good (D) Fairly good (E) Poor

THANK YOU

Appendix C

**Secondary Data from Health Facilities: Questions on Out-of-Pocket Items Before PBF
from Facility Records**

Questions	
Year of enrolment into PBF	
Year PBF equity program was introduced	
Number of skilled birth delivery for each year 2010-2020	
Number of C-section for each year 2010-2020	
Number of normal deliveries for each year 2010-2020	
Number of ANC1 ,2,3,4from 2010-2020 for all health facilities	
Cost for each out-of-pocket item before PBF from each health facility	
Cost for each out-of-pocket item after PBF from each health facility	

Appendix D

Interview Questions for Health Providers and Administrators

Objective Three: Below are the guiding questions and probes

Warm up questions to allow a comfortable environment for the informant	Probing guides and target informants
1. Please tell me a little bit about your health facility. 2. Please tell me about your role in the health facility.	All informants
Turn on to specific questions (questions depend on respondents, some questions are only for administrators, some for providers and some for regulators and PBF actors at regional and national level)	
1. Can you tell me more about the PBF equity program and your understanding of the program?	All informants
2. Can you tell me how you define poor and vulnerable in PBF?	At health facility management level and PBF team How do you define poor and vulnerable in PBF? Do you have any predefined criteria that you follow, or any steps that you follow? Who is responsible for validating the poor and vulnerable? How often do you validate the poor and vulnerable
3. At your health facility, can you tell me more about the poor and vulnerable?	At facility level: health providers How do you define poor and vulnerable at your facility? Do you have any predefined criteria that you follow, or any steps that you follow? Who is

	responsible for validating the poor and vulnerable? how often do you validate the poor and vulnerable
4. Can you tell me who is considered poor and vulnerable in your community?	At community (CHW) Who is considered poor and vulnerable in your community? How do you identify them? Do you have any predefined criteria that you follow, or any steps that you follow? Who is responsible for validating the poor and vulnerable at your community? How often do you validate the poor and vulnerable? What are your challenges in identifying poor and vulnerable. What ease your identification process
5. Can you tell me the procedure or steps involved in the assessment of poor and vulnerable in your health facility?	At community and facility level: What do you think about the process? Does it reflect the poor and vulnerable in your community? Can you share any example? Can you share other ways that can be used to validate PAV, who is responsible for validating PAV? At PBF-how do you validate PAV for equity incentives—follow up observation during PBF validation process-probes with steps and validation during observations
Specific questions based on PBF equity desing elements as listed in table 1.1 (the questions in asterisk are only for specific administrators identified to be responsible for validating PBF equity elements	Target to specific health facility administrators and PBF
6. PBF pay more for reaching poor person than non-poor, Can you tell me more about	Who is considered poor at your facility? How do you identify them?

this strategy at your health facility?	How much does PBF pay for reaching a poor person for ANC services? For skilled birth delivery? How do you use the incentives? How often do you receive poor women? What are your challenges in identifying poor women? What ease the identification process?
7. PBF pay providers more for services that are delivered in poor health areas, can you tell me more about this strategy at your health facility? *	What does this mean to your health facility? How often do you get this payment, what are the criteria used? Does the incentives help improve on the services you delivered for ANC and skilled birth delivery? Does it improve on the number of women attending ANC at your facility?
8. Can you tell me more about the cost for antenatal care services at your health facility? *	ANC1? laboratory fees? and skilled birth delivery and family planning at your facility? Has the cost reduced or increased with PBF? for which services? does this affect the number of women attending ANC at your facility number of women using your facility for delivery?
9. Can you tell me more about the community health worker program in your health facility under the PBF equity program?	Who select the CHW, do you sign contract with them, how often do they perform their task?, what are their task? is it documented? do you have regular meetings with them? What are your challenges working with CHW?
10. Do you have any demand side intervention at your health facility to support women during ANC and skilled birth delivery? Examples-voucher program, transportation support,	Was it introduced by PBF? Non PBF? How does it work? can you explain more in relation to the use of services by women
11. Based on what you have explained, can you share with me your challenges in implementing the PBF equity strategies we have discussed above?	-Your facilitators? -Ease in your implementation

12. Has the conflict affected the way you deliver care at your health facility?	Do you think PBF has any role to play positively or negatively? Can you tell me more? Probe further regarding IDPs
13. Has the COVID 19 affected the way you deliver care at your health facility for ANC and skilled birth delivery?	Do you think PBF has any role to play positively or negatively? Can you tell me more? Probe further on COVID19 aspect
14. We are coming to the end of this interview; is there anything you would like to discuss with me that we have not discussed today regarding the topic in question or any recommendations?	At facility, community or individual level

Appendix E

Interview Questions for Health Providers and PBF Managers

Below are the guiding questions and probes

Warm up questions	Probes
1. Tell me a little bit about your health facility or health district?	
2. Tell me about your role in the health facility or district or in PBF	depending on the individual's position).
Specific questions	
3.Can you share your experiences with PBF since its introduction	Your personal involvement? What is it like to be involved with PBF system in general?
4. Please tell me your experience with the PBF equity program at your health facility	what does it mean to you? Does make any difference to you compared before the implementation of PBF?
5.Can you tell me your expectations of PBF equity program?	What is it like to have such a program in your facility? Compared to before?
What is it like delivering care within a PBF setting?	When compared to before PBF? probe on daily impact before and after PBF (if not mentioned in discussion) in terms of quality of care, performance, motivation, workload
What is it like, transitioning from the previous system to the current system?	Can you tell me your challenges and facilitators during this transition process? Challenges with PBF? PBF equity program? What ease the transition process?
Looking back before PBF, say 5-10 years ago when PBF was not yet implemented, how would you describe your motivational level and your performance in doing your work before and after PBF?	Probe with Performance, quality, workload, keeping the PBF system or returning to the previous system
What are the sustainability plans or	(Depending on respondent characteristics) probe on institutional

mechanisms in place for the PBF equity program, at your facility, and PBF reform in general?	sustainability, technical sustainability and financial sustainability at your district, regional or national level your perspective of the sustainability of the PBF?
We are coming to the end of this interview, is there anything you would like to discuss with me or recommend in relation to the PBF equity program and PBF reform in Cameroon in general?	At community, health facility, individual or health system level?

Appendix F
Expected Number of Deliveries

Districts	Included in Impact Evaluation?	Total number of facilities per district	Total included in impact evaluation	Present of a regional hospital (public)	Public facilities included in impact evaluation	Private for profit included in impact evaluation	Confessional included in impact evaluation	Estimated Pop for 2021*	Expected # of pregnancies 2021*	Total # of live births 2021*
Buea	Yes	35	23	1	13	9	0	180,843	5885	5747
Limbe	Yes	35	20	1	11	7	1	206,887	6733	6575
Tiko	No	20	N/A	None	N/A	N/A	N/A	157,784	5135	5015
Total		90	43	2	24	16	1		17753	

* Data generated by the Ministry of Public Health in 2021 from the District Health Information System, by districts). This source provides the most current data on demographics for Cameroon (in the absence of an updated data on national population census) and was established in response to the COVID19 pandemic. The estimated population includes both men and women
Source: district health service

Appendix G
Equity Categories Provided by the Districts

Category	Accessibility	Population density	Poverty level	Distance from main town
1st Cat	Difficult in all season	Very sparse	Very poor	Furthest
2nd Cat	Difficult in raining season	Moderately sparse	Poor	Further
3rd Cat	Accessible	Moderately sparse	Moderately poor	Far
4th Cat	Accessible	Populated	Average	Far
5th Cat	Very accessible	Populated	Rich	Near

Source: PBF team

Appendix H

Supplemental File: A Systematic Review of the Effect of Performance-Based Financing on Out-of-Pocket Expenses to Improve Access to and Use of Maternal Health Services in Sub-Saharan Africa

SR Search strategy for PBF

Ovid Technologies, Inc. Email Service

Search for: 14 and 24

Database: Ovid MEDLINE(R) ALL <1946 to November 13, 2020>

Search Strategy:

-
- 1 africa/ or exp "africa south of the sahara"/ (237719)
 - 2 (Afghanistan or Albania or Algeria or Angola or Argentina or Armenia or Armenian or Azerbaijan or Benin or Botswana or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Cote d'Ivoire or Ivory Coast or Djibouti or French Somaliland or East Timur or Egypt or United Arab Republic or Eritrea or Ethiopia or Gabon or Gabonese Republic or Gambia or Ghana or Guinea or Kenya or Lesotho or Liberia or Libya or Macedonia or Madagascar or Malaya or Malawi or Mali or Mauritania or Mauritius or Mozambique or Niger or Nigeria or Rwanda or Ruanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or Sudan or Swaziland or South Africa or Tanzania or Togo or Togolese Republic or Tonga or Uganda or western Sahara or West Bank or Zambia or Zimbabwe).ti,ab,kf. (379661)
 - 3 1 or 2 (469877)
 - 4 Reimbursement, Incentive/ or remuneration/ or "salaries and fringe benefits"/ (20260)
 - 5 reimbursement.ti,ab,kf. (23402)
 - 6 (pay* adj2 performance*).ti,ab,kf. (2510)
 - 7 ((incentiv* or compensat* or reimburs*) adj2 plan?).ti,ab,kf. (771)
 - 8 (conditional adj2 (pay* or transfer?)).ti,ab,kf. (432)
 - 9 ((result* or perform* or output* or out put*) adj2 (financ* or fund* or pay* or disburs* or fee?)).ti,ab,kf. (11692)
 - 10 ((pay* or monetar* or economic* or financ*) adj2 (compensation or incentive? or reward* or bonus or bonuses)).ti,ab,kf. (11182)
 - 11 (financial support* or remunerat* or salar* or earnings).ti,ab,kf. (22775)
 - 12 (performance adj2 financing*).ti,ab,kf. (213)
 - 13 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (81653)
 - 14 3 and 13 (2551)
-

Ovid Technologies, Inc. Email Service

Search for: 14 and 24

Results: 50

Database: Embase Classic+Embase <1947 to 2020 November 18>

Search Strategy:

-
- 1 africa/ or exp "africa south of the sahara"/ (320875)
 - 2 (Afghanistan or Albania or Algeria or Angola or Argentina or Armenia or Armenian or Azerbaijan or Benin or Botswana or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Cote d'Ivoire or Ivory Coast or Djibouti or French Somaliland or East Timur or Egypt or United Arab Republic or Eritrea or Ethiopia or Gabon or Gabonese Republic or Gambia or Ghana or Guinea or Kenya or Lesotho or Liberia or Libya or Macedonia or Madagascar or Malaya or Malawi or Mali or Mauritania or Mauritius or Mozambique or Niger or Nigeria or Rwanda or Ruanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or Sudan or Swaziland or South Africa or Tanzania or Togo or Togolese Republic or Tonga or Uganda or western Sahara or West Bank or Zambia or Zimbabwe).ti,ab,kw. (487843)
 - 3 1 or 2 (596125)
 - 4 reimbursement.mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword, floating subheading word, candidate term word] (70055)
 - 5 reimbursement.ti,ab,kw. (36836)
 - 6 (pay* adj2 performance*).ti,ab,kw. (3196)
 - 7 ((incentiv* or compensat* or reimburs*) adj2 plan?).ti,ab,kw. (972)
 - 8 (conditional adj2 (pay* or transfer?)).ti,ab,kw. (494)
 - 9 ((result* or perform* or output* or out put*) adj2 (financ* or fund* or pay* or disburs* or fee?)).ti,ab,kw. (18319)
 - 10 ((pay* or monetar* or economic* or financ*) adj2 (compensation or incentive? or reward* or bonus or bonuses)).ti,ab,kw. (14365)
 - 11 (financial support* or remunerat* or salar* or earnings).ti,ab,kw. (30230)
 - 12 (performance adj2 financing*).ti,ab,kw. (228)
 - 13 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (128033)
 - 14 3 and 13 (3204)

Ovid Technologies, Inc. Email Service

Search for: 3 and 13

Results: 100

Database: EBM Reviews - Cochrane Central Register of Controlled Trials <October 2020>, EBM Reviews - Cochrane Database of Systematic Reviews <2005 to November 19, 2020>

Search Strategy:

-
- 1 africa/ or exp "africa south of the sahara"/ (6669)
 - 2 (Afghanistan or Albania or Algeria or Angola or Argentina or Armenia or Armenian or Azerbaijan or Benin or Botswana or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Cote d'Ivoire or Ivory Coast or Djibouti or French Somaliland or East Timur or Egypt or United Arab Republic or Eritrea or Ethiopia or Gabon or Gabonese Republic or Gambia or Ghana or Guinea or Kenya or Lesotho or Liberia or Libya or

Macedonia or Madagascar or Malaya or Malawi or Mali or Mauritania or Mauritius or Mozambique or Niger or Nigeria or Rwanda or Ruanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or Sudan or Swaziland or South Africa or Tanzania or Togo or Togolese Republic or Tonga or Uganda or western Sahara or West Bank or Zambia or Zimbabwe).ti,ab,kw. (19650)

3 1 or 2 (21311)

4 reimbursement.mp. [mp=ti, ot, ab, sh, hw, kw, tx, ct] (1797)

5 reimbursement.ti,ab,kw. (1466)

6 (pay* adj2 performance*).ti,ab,kw. (154)

7 ((incentiv* or compensat* or reimburs*) adj2 plan?).ti,ab,kw. (30)

8 (conditional adj2 (pay* or transfer?)).ti,ab,kw. (179)

9 ((result* or perform* or output* or out put*) adj2 (financ* or fund* or pay* or disburs* or fee?)).ti,ab,kw. (1443)

10 ((pay* or monetar* or economic* or financ*) adj2 (compensation or incentive? or reward* or bonus or bonuses)).ti,ab,kw. (2010)

11 (financial support* or remunerat* or salar* or earnings).ti,ab,kw. (1105)

12 (performance adj2 financing*).ti,ab,kw. (21)

13 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 (6123)

14 3 and 13 (332)

CINAHL (EbscoHost)

#	Query	Limiters/Expanders	Results
S1	(MH "Africa South of the Sahara+")	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	69,364
S2	T1(Afghanistan or Albania or Algeria or Angola or Argentina or Armenia or Armenian or Azerbaijan or Benin or Botswana or Burkina Faso or Burkina Fasso or Upper Volta or Burundi or Urundi or Cameroon or Cameroons or Cameron or Camerons or Cape Verde or Central African Republic or Chad or Comoros or Comoro Islands or Comores or Mayotte or Congo or Zaire or Cote d'Ivoire or Ivory Coast or Djibouti or French Somaliland or East Timur or Egypt or United Arab Republic or Eritrea or Ethiopia or Gabon or Gabonese Republic or Gambia or Ghana or Guinea or Kenya or Lesotho or Liberia or Libya or Macedonia or Madagascar or Malaya or Malawi or Mali or Mauritania or Mauritius or Mozambique or Niger or Nigeria or Rwanda or Ruanda or Sao Tome or Senegal or Seychelles or Sierra Leone or Somalia or Sudan or Swaziland or South Africa or Tanzania or Togo or Togolese Republic or Tonga or Uganda or western Sahara or West Bank or Zambia or Zimbabwe)	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	4
S3	S1 OR S2	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	69,367
S4	(MH "Physician Incentive Plans") OR (MH "Salaries and Fringe Benefits")	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	27524
S5	(MH "Fee for Service Plans") OR (MH "Reimbursement, Incentive")	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	5203
S6	TI reimbursement OR AB reimbursement	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	13115
S7	TI pay* N2 performance* OR AB pay* N2 performance*	Expanders - Apply related words; Apply equivalent subjects Search modes -	2044

		Boolean/Phrase	
S8	TI (((incentiv* or compensat* or reimburs*) N2 plan?)) OR AB (((incentiv* or compensat* or reimburs*) N2 plan?)))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	324
S9	TI ((conditional N2 (pay* or transfer?))) OR AB ((conditional N2 (pay* or transfer?))))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	227
S10	TI (((result* or perform* or output* or "out put*") N2 (financ* or fund* or pay* or disburs* or fee?))) OR AB (((result* or perform* or output* or "out put*") N2 (financ* or fund* or pay* or disburs* or fee?))))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	6441
S11	TI (((pay* or monetar* or economic* or financ*) N2 (compensation or incentive? or reward* or bonus or bonuses))) OR AB (((pay* or monetar* or economic* or financ*) N2 (compensation or incentive? or reward* or bonus or bonuses))))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	5426
S12	TI (("financial support*" or remunerat* or salar* or earnings)) OR AB (("financial support*" or remunerat* or salar* or earnings)))	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	11173
S13	S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	61823
S14	S3 AND S13	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	1041
S15	S3 AND S13	Expanders - Apply related words; Apply equivalent subjects Search modes - Boolean/Phrase	1041

Appendix I

PRISMA Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pages 5-6
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 7
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 8
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 8
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Page 8, fig 1 & suppl. File 1
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 9
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 9
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 10
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 11
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 11
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Page 10
Synthesis	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention	Page 10

Section and Topic	Item #	Checklist item	Location where item is reported
methods		characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 10
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 11
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 11
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 10
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 11
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Page 11 & Table 3
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Pages 10 & 11
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Page 11 & Fig 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Page 11 & supplemental File 1
Study characteristics	17	Cite each included study and present its characteristics.	Tables 1&2
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Table 3
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pages 12-15 & Table 4
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Pages 12-15
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Table 4
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Pages 15-17 & Table 4
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Table 4
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Pages 15-17
Certainty of	22	Present assessments of certainty (or confidence) in the body of	Pages 12-15

Section and Topic	Item #	Checklist item	Location where item is reported
evidence		evidence for each outcome assessed.	& Table 4
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pages 17-18
	23b	Discuss any limitations of the evidence included in the review.	Page 20
	23c	Discuss any limitations of the review processes used.	Page 20
	23d	Discuss implications of the results for practice, policy, and future research.	Pages 19-20
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 7
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 7
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 7
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 21
Competing interests	26	Declare any competing interests of review authors.	Page 21
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 21

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: <http://www.prisma-statement.org/>

Appendix J
Supplemental File: Excluded Papers

Authors/Year/Country	Reasons for exclusion
1. Basinga et al., 2011, Rwanda	Did not provide sufficient information in relation to PBF on OOP to be included
2. Lannes et al.,2016, Rwanda	Did not provide sufficient information in relation to PBF on OOP to be included
3. Chansa et al., 2015, Zambia	Did not provide sufficient information in relation to PBF on OOP to be included
4. Chansa et al., 2020, Zambia	Did not provide sufficient information in relation to PBF on OOP to be included
5. Friedman et al 2016, Zambia	Did not provide sufficient information in relation to PBF on OOP to be included
6. Kreindrebeogoet al.,2015 Chad/Tchad	Did not provide sufficient information in relation to PBF on OOP to be included
7. Rudasingwa et al., 2017 Burundi	Did not provide sufficient information in relation to PBF on OOP to be included
8. Skiles et al.,2013, Rwanda	Did not provide sufficient information in relation to PBF on OOP to be included
9. Sato & Belel 2020 Nigeria-Adamawa state	Did not provide sufficient information in relation to PBF on OOP to be included
10. Steenland et al.,2017 Burkina Faso	Did not provide sufficient information in relation to PBF on OOP to be included
11. Zizen et al., 2019 Burkina Faso	Did not provide sufficient information in relation to PBF on OOP to be included
12. Zombre et al., 2020 Mali	Did not provide sufficient information in relation to PBF on OOP to be included
13. Zang et al2015, Cameroon	Did not provide sufficient information in relation to PBF on OOP to be included
14. Zeng et al., 2018 Republic of the Congo	Did not provide sufficient information in relation to PBF on OOP to be included
15. Basinga P,2009 Rwanda	Did not provide sufficient information in relation to PBF on OOP to be included
16 Soeters 2009	Did not meet PICO
17 Soeters et al.2005	Did not meet PICO
18 Shapira et al., 2018 Rwanda	Did not provide sufficient information in relation to PBF on OOP to be included
19 Vergeer 2008	Did not provide sufficient information in relation to PBF on OOP to be included
20 De Walque et al.,2018	Did not provide sufficient information in relation to PBF

Cameroon	on OOP to be included
21 Brennar et al., 2018 Malawi	Did not meet PICO criteria for outcome measure
22 Brennar et al., 2017	Did not provide sufficient information in relation to PBF on OOP to be included
23 Binyaruka & Anselmi,2020	Did not provide sufficient information in relation to PBF on OOP to be included
24 Chansa et al., 2020 Zambia	Did not provide sufficient information in relation to PBF on OOP to be included
25 Chinkhumba et al., 2020 Malawi	Did not meet PICO criteria for outcome measure, focus on cost measures
26 De Allegri et al.,2019, Malawi	Did not provide sufficient information in relation to PBF on OOP to be included
27 De Allegri et al.,2019, Burkina Faso	Did not provide sufficient information in relation to PBF on OOP to be included
28 Falisse et al., 2015 Burundi	Did not provide sufficient information in relation to PBF on OOP to be included
29 Gage & Bauhoff,2021	Did not meet PICO
30 Jacobs et al.,2020 CAR, Nigeria and DRC	Did not meet PICO
31 Kiendrébéogo et al.,2015 Chad	Did not provide sufficient information in relation to PBF on OOP to be included
32 Mussah et al., 2017 Liberia	Did not meet PICO
33 Nahimana et al., 2016 Rwanda	Did not provide sufficient information in relation to PBF on OOP to be included
34 Paul et al.,2017 Benin	Did not meet PICO
35 Rajkotia et al., 2017 Mozambique	Did not provide sufficient information in relation to PBF on OOP to be included
36 Rusa et al.,2009 Rwanda	Did not meet PICO
37 Rudasingwa et al.,2015 Burundi	Did not provide sufficient information in relation to PBF on OOP to be included
38 Rudasingwa et al., 2014 Burundi	Did not provide sufficient information in relation to PBF on OOP to be included
39 Shapira et al., 2018	Did not meet PICO
40 Soeters et al.,2011 DRC	Did not provide sufficient information in relation to PBF on OOP to be included
41 Turcotte-Tremblay et al.,2018 Burkina Faso	Did not meet PICO
42 Mofoka et al., 2017 Lesotho	Did not provide sufficient information in relation to PBF on OOP to be included
43 Chukwuma et al., 2017 Nigeria	Did not provide sufficient information in relation to PBF on OOP to be included

44 Zeng et al., 2018 Zambia	Did not meet PICO elements
45 Rudasingwa et al., 2017 Burundi	Did not provide sufficient information in relation to PBF on OOP to be included
46 Beauge et al 2020 Burkina Faso	Did not meet PICO
47 Kandpal et al., 2018 Nigeria	Did not provide sufficient information in relation to PBF on OOP to be included
48 Mofoka et al., 2017 Lesotho	Did not meet PICO
49 Brennar et al., 2014 Malawi	Did not meet PICO
50 Sieleunou et al., 2020 Cameroon	Did not meet PICO
51 Oyebola et al., 2014 Nigeria	Did not meet PICO
52 Chinkhumba et al., 2015 Malawi	Did not provide sufficient information in relation to PBF on OOP to be included
53 Sekabaraga et al., 2011 Rwanda	Did not meet PICO
54 Borghi et al., 2013 Tanzania	Did not meet PICO
55 Zambia impact evaluation 2014	Did not provide sufficient information in relation to PBF on OOP to be included
56 Manthulu et al., 2016 Malawi	Did not meet PICO
57 Maini et al., 2014 Congo	Did not meet PICO
58 Ntambue et al., 2018 Congo	Did not meet PICO
59 Zeng et al., 2018 Zimbabwe	Did not meet PICO
60 Manzi et al., 2019 Rwanda	Did not meet PICO
61 Binyaruka et al., 2018 Tanzania	Did not provide sufficient information in relation to PBF on OOP to be included
62 Gotto et al., 2017 Uganda	Did not provide sufficient information in relation to PBF on OOP to be included
63 Rajkotia et al., 2015 Mozambique	Did not provide sufficient information in relation to PBF on OOP to be included
64 Bezu et al., 2021 Tanzania	Did not provide sufficient information in relation to PBF on OOP to be included
65 Binyaruka et al., 2017 Tanzania	Did not provide sufficient information in relation to PBF on OOP to be included
66 McMahon et al., 2016 Malawi	Did not meet PICO
67 Ngo et al., 2017	Did not meet PICO
68 Fox et al., 2014	Did not meet PICO

69 Nimpagaritse et al., 2016	Did not meet PICO
70 Janssen et al., 2015	Did not meet PICO
71 Grittner 2013	Did not meet PICO
72 Gergen et al., 2018	Did not meet PICO

Appendix K

Supplemental Material for Chapter 5

STROBE Statement—Checklist of items that should be included in reports of *cross-sectional studies*

	Item No	Recommendation	Page No
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	1&2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1&2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4&5
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	7&8
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	7
Bias	9	Describe any efforts to address potential sources of bias	7&8
Study size	10	Explain how the study size was arrived at	8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	9
		(b) Describe any methods used to examine subgroups and interactions	9
		(c) Explain how missing data were addressed	9
		(d) If applicable, describe analytical methods taking account of sampling strategy	
		(e) Describe any sensitivity analyses	9
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9&10
		(b) Give reasons for non-participation at each stage	
		(c) Consider use of a flow diagram	Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	9
Outcome data	15*	Report numbers of outcome events or summary measures	9&10

Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	10-18 Tables 1-6
		(b) Report category boundaries when continuous variables were categorized	
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	19-21
Discussion			
Key results	18	Summarise key results with reference to study objectives	21-22
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	23-25
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	22-23
Generalisability	21	Discuss the generalisability (external validity) of the study results	23&24
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	26

Appendix L

Supplemental Table for COREG Check List for Chapter 7

COREG (CONSOLIDATED criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	244
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	244
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	243
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	245
Domain 2: Study design			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	240
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	241
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	242-243
Sample size	12	How many participants were in the study?	243 & 247
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	243
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	243
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	244
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	243-244
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	No
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	243
Field notes	20	Were field notes made during and/or after the interview or focus group?	244
Duration	21	What was the duration of the interviews or focus group?	243
Data saturation	22	Was data saturation discussed?	241 & 243
Transcripts returned	23	Were transcripts returned to participants for comment and/or	245

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	245-246
Description of the coding tree	25	Did authors provide a description of the coding tree?	245-246
Derivation of themes	26	Were themes identified in advance or derived from the data?	245-246
Software	27	What software, if applicable, was used to manage the data?	245
Participant checking	28	Did participants provide feedback on the findings?	245
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	255-264
Data and findings consistent	30	Was there consistency between the data presented and the findings?	265-275
Clarity of major themes	31	Were major themes clearly presented in the findings?	265-275
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	265-275

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

Appendix M

Supplemental Table for COREG Check List for Chapter 8

COREG (CONsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	295
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	295
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	295
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	292
Domain 2: Study design			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	294
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	294
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	295
Sample size	12	How many participants were in the study?	294
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	295
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	295
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	298
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	295
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	No
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	295
Field notes	20	Were field notes made during and/or after the interview or focus group?	295
Duration	21	What was the duration of the interviews or focus group?	295-296
Data saturation	22	Was data saturation discussed?	294
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	296
Description of the coding tree	25	Did authors provide a description of the coding tree?	299
Derivation of themes	26	Were themes identified in advance or derived from the data?	296 & 298
Software	27	What software, if applicable, was used to manage the data?	296
Participant checking	28	Did participants provide feedback on the findings?	295
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	299-303
Data and findings consistent	30	Was there consistency between the data presented and the findings?	304-309
Clarity of major themes	31	Were major themes clearly presented in the findings?	296-308
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	304-309

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

Appendix N

Focus Group Discussion Guide

Focus group discussion was held separately for women who are PAV and those who are not PAV. The FGD guide

Focus Group Discussion Guide and Questions

Check: date and venue, tape recording (by permission). Informed Consent (Can postpone or withdrawn at any time) Make sure the anonymous of the participants is discuss and the fact that participants can refuse to answer any question. Discuss the fact that the question can be reworded if it is not clear to participant. Participants: women who are PAV and those who are not PAV and have given birth and identified to have used the facility before and after PBF.

Focus Group Discussion guide (adapted from Dr. Krentel's guide)

Introduce the following to the group:

Go around table: participant will introduce themselves....

- Who we are and what we're trying to do
- What will be done with this information
- Why we asked you to participate

Thank you for agreeing to participate in this topic. We are very interested to hear your valuable opinion on your knowledge, experiences, challenges, and motivation (facilitators) to access and use antenatal care and skilled delivery in your health area. The purpose of this study is to explore your experiences and opinions on accessing antenatal care and skilled birth delivery services in your health area. The result of the study will inform policy that is directly related to PBF and policy that is complementary to PBF. The results can be used to monitor the effects of PBF programs over time and to provide input into the way PBF programs are designed and implemented. The information you give us is completely confidential, and we will not associate your name with anything you say in the focus group.

- We would like to tape the focus groups so that we can make sure to capture the thoughts, opinions, and ideas we hear from the group. No names will be attached to the focus groups and the tapes will be destroyed at the end of the study.
- You may refuse to answer any question or withdraw from the study at any time at no risk to yourself or access to health services.
- We understand how important it is that this information is kept private and confidential. We will ask participants to respect each other's confidentiality.
- If you have any questions now or after you have completed the questionnaire, you can always contact the project investigator, or the research assistant or a REB member whose names and phone numbers are on the consent form.
- Please read the information sheet and if you have any questions or concerns, please do not hesitate to ask. Then, check and sign to show you agree to participate in this focus group.
- As a reminder, please note that focus group is not the time to give health information, if you have any questions related to health please stick around and we will listen to you and refer you to the appropriate department to answer your questions
- Demographic characteristics and health area of participants is taken at the end.

Introduction

1. Welcome

Introduce myself and the note taker, and send the Sign-In Sheet

Explanation of the process

Ask the group if anyone has participated in a focus group before. Explain that focus groups are being used more and more often in health and health services research.

About focus groups

- We learn from you (positive and negative)
- Not trying to achieve consensus, we're gathering information
- No virtue in long lists: we're looking for priorities
- In this project, we are doing questionnaires, in-depth interviews, and focus group discussions. The reason for using both tools is that we can get more in-depth information from a smaller group of people in focus groups. This allows us to understand the context behind the answers given in the written survey and helps us explore topics in more detail than we can do in a written survey.
- Remember not to allow any other person to join after the consent process has been completed

Logistics

- Focus group will last about 1-max 1.5hr
- Feel free to move around
- You can step out if you need to use the bathroom
- Help yourself to refreshments

2. Ground Rules

Will ask the group to suggest some ground rules. After they brainstorm some, will make sure the following are on the list.

- Everyone should participate one at a time
- Information provided in the focus group must be kept confidential
- Stay with the group and please don't have side conversations
- Turn off cell phones if possible
- Assign number to each participant for identification during discussion

3. Turn on Tape Recorder

4. Ask the group if there are any questions before we get started and address those questions.

Assign the numbers at the beginning to them as their names

Discussion begins, make sure to give people time to think before answering the questions and don't move too quickly. Use the probes to make sure that all issues are addressed, but move on when you feel you are starting to hear repetitive information

Questions

The questions are the same as the questions in the survey—using an open-ended format.

General Probes: Tell me what you mean by.... Can you explain little bit more about that? What happened next? Are there any reasons for that?

We are coming to the close of our interview is there anything you will like to tell me or recommend about care at the following;

- Health facility level
- Community level
- District level

At the end of the discussion thank the members for coming and sharing their thoughts and opinions with us. We have a short evaluation form that we would like you to fill out if you have time. If you have additional information that you did not get to say in the focus group, please feel free to write it on this evaluation form.

Materials and supplies for focus groups

- Sign-in sheet
- Consent forms (one copy for participants, one copy for the investigator)
- Evaluation sheets, one for each participant or verbal evaluation
- Assign number to participant
- Recording device
- Notebook for note-taking
- Refreshments
- tissues

Appendix O

Informed Consent Form for Interviews and Focus Groups for Women

Title of Project: Examining the role of performance-based financing equity program to increase access and utilization of maternal and child health services in Cameroon.

Principal Investigator: Miriam N. Nkangu, School of Epidemiology and Public Health, University of Ottawa, Canada. 451 Smyth Road,

Version date October 2020

Supervisors

Dr. Sanni Yaya, University of Ottawa, School of International Development and Global Studies, Faculty of social sciences, social sciences building, 120 University, Room 8006

Dr Julian Little, University of Ottawa, School of Epidemiology and Public Health

Purpose of the study: This study is to examine the PBF equity program and how it is defined and implemented in your health area and health system at large. To understand the challenges and facilitators in the implementation process, and to explore if the PBF equity program can help close the equity gap in the use of maternal and child health services when there are no specific provisions to target the poorest in the population. The result of the study will inform policy that is directly related to PBF equity elements and policy that is complementary to PBF. The results can be used to monitor the effects of PBF programs over time and to provide input into the way PBF programs are designed and implemented. In addition, the research will complement the impact evaluation report by exploring some policy questions raised in the impact evaluation report. The exit survey will last for 25 minutes, and the focus group discussions will last between 1 to maximum of 1.5 hours.

Funding: This study received partial financial support from supervisors and the student mobility bursary to facilitate data collection in the field

Participation: You have been selected to participate in this research study because you are at least 21 years of age to maximum 49 years and currently pregnant attending antenatal care clinic or you have given birth at a health facility at the time of this study. Your participation will consist of a survey with a research assistant or research investigator. You may be invited to participate in a focus group discussion. You may be requested to refer anyone whom you know can best provide relevant information related to the conversation. However, their consent will be required before participation. You may be requested to take photographs which may be used in publications and presentation of the research findings. The orientation and focus group discussion will both take place at a convenient location in the community. This will likely be in the afternoon or out of normal business hours and will depend upon your schedule and that of other participants. The focus group will be audio-recorded in order to accurately capture what is said. You may request that the recording be paused at any time, and you may decide how much or how little you wish to speak during the discussion. The focus group discussion may last for up to 1.5 hours. All information that you will share will be kept confidential and strictly used for the purpose of the project only.

Risk: During your participation in this project, you may discuss personal challenges and experiences with the health services, access, affordability, availability and utilization of reproductive, maternal and child

health services within my community. If sharing negative experiences, could cause emotional discomfort, stress anxiety or later regret. you have the assurance from the project investigator that every effort will be made to minimize these risks by attempting to establish a respectful and comfortable environment for all during the research project.

Benefits: Your participation in this project will help to inform intervention strategies for the health facilities, the district health services, the PBF community, stakeholders, and the outcome of the project will inform policy and provision of health services in your community.

Compensation/Cost: You will not incur any extra cost to participate in this study nor receive any payment for participation. However, during the focus group discussion session, you MAY (depending on the distance and method of transportation to the venue), receive compensation for transportation to and from your home to the location depending on the distance from your place of residence. You will be remunerated directly by the project investigator through CEREDRUP Cameroon at the end of the focus group discussion, and you will be required to sign a form acknowledging receipt of transport payment. In the case where you are unable to sign, you will provide a copy of any form of identification to CEREDRUP upon receipt of transport remuneration. In addition, you will be provided refreshment during the focus group session.

Confidentiality: You have the assurance from the project investigator and research assistant that the information you will share is confidential in nature. However, during focus group discussion, information shared is exposed to other participants and may have limits to confidentiality due to the inability to control the actions of others. The project investigator will maintain anonymity of all participants and will invite all participants to keep everything shared in the focus group discussion confidential and invite all members to respect the integrity of each participant.

Conservation of data: The data that will be collected (both hard copies and electronic) for example, consent form will be kept in a secure manner. Electronic data will be stored with secured access on a server. A backup copy of the data will be encrypted and stored on two password protected external hard drives which will be accessible only by the project investigator. Data will be destroyed after 10 years by the project investigator.

Voluntary participation: You are under no obligation to agree to participate, and your decision will have no effect on your standard of care treatment within the community or health facility. You can withdraw your consent from the study at any time or refuse to answer any question, without suffering any negative consequences. If you choose to withdraw at any point in time, you will still be entitled to any benefit assigned to you (if any). However, you understand that any individual contribution made during the focus group discussion cannot be withdrawn due to the interdependence nature of focus group data. Also, the data that is collected by health providers will remain in the system at the health facility, but the research team will not use the data for the study.

Voluntary photo or video image: You are under no obligation to agree to have your image published in any of the project activities (this image includes photos or short videos taken during focus group discussions, key informant interview, during antenatal care or process of delivery, and/or a photo of me with my baby). If you decide not to have your image published, it will not have any effect to your care and If you choose to withdraw your consent for video or photo image any point in time, you will still be entitled to any benefit assigned to you, if any.

Acceptance: You----- agree to participate in the above research project conducted by the principal investigator, Miriam Nkangu, under the supervision of Dr. Sanni Yaya and Dr Julian Little of University of Ottawa.

By your signature below/or verbal agreement, you agree to comply with all the research activities as outlined above.

If you have any questions about the research project, you may contact the project investigator at the local number :

If you have any question regarding the ethical conduct of this research project, you may contact the Research Ethics Board at

There are two copies of the consent form, one of which is yours to keep.

For oral acceptance-participant will repeat acceptance statement after the interviewer

Signature

Participant ----- Witness-----

Date ----- Time-----

Project investigator-----Time-----Date

For written acceptance

Signature

Participant -----Witness

Date----- Time.....

Project investigator-----Time-----Date

Optional Image Release

I, -----, give the project leads permission to use my photographs in which I appear for any of the project related publications and presentation where relevant.

Signature----- Date-----

If you have any questions about this, please contact the principal investigator as stated above.

You can reach the Research Ethics board if you have any concerns or questions at

*****Before any data collection occurs the approved English form of this form may be translated (if needed) and adjusted to the “tone” of Pidgin English (the local language in this region of Cameroon**

Assent form

Principal Investigator: Miriam N. Nkangu, School of Epidemiology and Public Health, University of Ottawa, Canada. 451 Smyth Road,

Version date October 2020

Supervisors

Dr. Sanni Yaya, University of Ottawa, School of International Development and Global Studies, Faculty of social sciences, Social sciences building, 120 University, Room 8006

Co Supervisor: Dr Julian Little School of Epidemiology and Public Health University of Ottawa Canada

I am a PhD student from University of Ottawa collaborating with CEREDRUP, Cameroon in conducting research as part of my PhD thesis. I am conducting research for women who are currently pregnant or who have given birth within the past two years in your health area to understand the effects of out-of-pocket expenditures on access and utilization of maternal health services in your community and to explore opinions. This will help inform policy and funding bodies on health interventions. I will read a statement explaining the study and you are under no obligation to accept to participate in the study. You have the right to accept or refuse to participate.

You can ask question about this study any time. If you decide at any time not to finish, you can ask me to stop.

This form is for the guardians to provide consent if you choose to participant and/or if your guardians accept and provide consent for participation. If you choose to sign this form, it means that your guardian have read this and that you can participate in the interview, if you do not want to participate in the

interview, you do not sign this form. It is up to you to choose if you want to be interviewed and no one will be upset if you chose not to be interviewed.

I will also require consent from your guardian if you decide to participate.

Signature

Participant ----- Witness-----

Date ----- Time-----

Project Investigator-----Time-----Date

For written acceptance

Signature

Participant ----- Witness

Date----- Time.....

Project Investigator-----Time-----Date

Recruitment Text

Title of Project: Examining the role of performance-based financing equity program to increase access and utilization of maternal and child health services in Cameroon.

Principal investigator

Miriam N. Nkangu, School of Epidemiology and Public Health, University of Ottawa, Canada. 451 Smyth Road,

Supervisors

Dr. Sanni Yaya, University of Ottawa, School of International Development and Global Studies, Faculty of social sciences, Social sciences building, 120 University, Room 8006

Dr Julian Little, University of Ottawa, School of Epidemiology and Public Health

Good day! My name is _____. I am a PhD candidate from University of Ottawa collaborating with local NGO, CEREDRUP Cameroon in conducting research as part of my PhD thesis. We are conducting research for women who are currently pregnant or who have given birth at a health facility in your health area to understand the effects of out-of-pockets expenditures on access and utilization of maternal health services in your community. This will help inform policy and funding bodies on health interventions. I will read a statement explaining the study and you are under no obligation to accept to participate in the study. You have the right to accept or refuse to participate. If you wish to participate in the study, I will read a statement to get your informed consent, if you choose not to participate in the research, it will not have any effect on your standard of care.

Your health area has been selected to participate in this study and the data collection will last for up to 4months from April 2021 to August 2021. We will be asking you questions on out-of-pocket expenditures and quality of care in relation to access and utilization of maternal and child health services in your area. The information may be used by the ministry of health (and district health services), organizations supporting PBF services in your facility, and researchers, for planning service improvement or for conducting further studies on health services.

Neither your name nor that of any other health worker respondents participating in this study will be included in the dataset or in any report. You may refuse to answer any question or choose to stop the interview at any time. If there are questions for which someone else is the most appropriate person to provide the information, we would appreciate if you introduced us to that person to help us collect that information.

I would like to know if you have any questions about the research?

Would you be interested in participating in the research?

If Yes, proceed to read informed consent form.

If No, thank you for your time and in case you change your mind you can contact the project investigator at the number

Appendix P

Informed Consent Form for Interviews with Health Providers, Administrators and Focus Group with CHW

Title of Project: Examining the role of performance-based financing equity program to increase access and utilization of maternal and child health services in Cameroon.

Principal Investigator: Miriam N. Nkangu, School of Epidemiology and Public Health, University of Ottawa, Canada. 451 Symth Road,
Version date October 2020

Supervisors

Dr. Sanni Yaya, University of Ottawa, School of International Development and Global Studies, Faculty of social sciences, social sciences building, 120 University, Room 8006
Dr Julian Little, University of Ottawa, School of Epidemiology and Public Health

Purpose of the study: This study is to examine the PBF equity program and how it is defined and implemented in your health area and health system at large. To understand the challenges and facilitators in the implementation process and explore ways it can help close the equity gap in the use of maternal and child health services when there are no specific provisions to target the poorest in the population. The result of the study will inform policy that is directly related to PBF equity elements and policy that is complementary to PBF. The results can be used to monitor the effects of PBF programs over time and to provide input into the way PBF programs are designed and implemented. In addition, the research will complement the impact evaluation report by exploring some policy questions raised in the impact evaluation report. The interview will last for about 30minutes, and the focus group discussions (for community health workers ONLY) will last between 1 to maximum of 1.5 hours.

Funding: This study received partial financial support from supervisors and the student mobility bursary to facilitate data collection in the field.

Participation: You have been selected to participate in this research study because you are at least 21 years of age and you are a health provider or community health worker at a health facility or health area and living in Tiko, Limbe or Buea at the time of this study. Your participation will consist of an interview with the research investigator or focus group discussion. You may be requested to refer anyone whom you know can best provide relevant information related to the conversation. However, their consent will be required before participation. You may be requested to take photographs which may be used in publications and presentation of the research findings.

For the focus group, the orientation and focus group discussion will both take place at a convenient location in the community. This will likely be in the afternoon or out of normal business hours and will depend upon your schedule and that of other participants. The focus group will be audio-recorded in order to accurately captured what is said. You may request that the recording be paused at any time, and you may decide how much or how little you wish to speak during the discussion. The focus group discussion may last for up to 1.5 hours. All information that I will shared will be kept confidential and strictly used for the purpose of the project only.

Risk: During your participation in this project, you may discuss personal challenges and experiences with the health services, access, affordability, availability and utilization of reproductive, maternal and child health services within your health facility or community. If sharing negative experiences, could cause emotional discomfort, stress anxiety or later regret. you have the assurance from the project investigator that every effort will be made to minimize these risks by attempting to establish a respectful and comfortable environment for all during the research project.

Benefits: Your participation in this project will help to inform the district health services, the PBF community, stakeholders, the outcome of the project to inform policy and provision of health services in your community.

Compensation/Cost: You will not incur any extra cost to participate in this study nor receive any payment for participation. However, if you are invited for focus group discussion, during the focus group discussion session, you MAY (depending on the distance and method of transportation to the venue), receive compensation for transportation to and from your home to the location depending on the distance from your place of resident. You will be remunerated directly by the project investigator through CEREDRUP Cameroon at the end of the focus group discussion, and you will be required to sign a form acknowledging receipt of transport payment. In the case where you are unable to sign, you will provide a copy of any form of identification to CEREDRUP upon receipt of transport remuneration. In addition, you will be provided refreshment during the focus group session.

Confidentiality: you have the assurance from the project investigator and research assistant that the information you will share is confidential in nature. However, during focus group discussion, information shared is exposed to other participants and may have limits to confidentiality due to the inability to control the actions of others. The project investigator will maintain anonymity of all participants and will invite all participants to keep everything shared in the focus group discussion confidential and invite all members to respect the integrity of each participant.

Conservation of data: The data that will be collected (both hard copies and electronic) for example, consent form will be kept in a secure manner. Electronic data will be stored with secured access on a server. A backup copy of the data will be encrypted and stored on two password protected external hard drives which will be accessible only by the project investigator. Data will be destroyed after 10years by the project investigator.

Voluntary participation: You are under no obligation to agree to participate, and your decision will have no effect on your standard of care treatment within the community or health system. You can withdraw your consent from the study at any time or refuse to answer any question, without suffering any negative consequences. If you choose to withdraw at any point in time, you will still be entitled to any benefit assigned to you (if any). However, you understand that any individual contribution made during the focus group discussion cannot be withdrawn due to the interdependence nature of focus group data. Also, the data that is collected by health providers will remain in the system at the health facility, but the research team will not use the data for the study.

Voluntary photo or video image: You are under no obligation to agree to have my image published in any of the project activities(this image includes photos or short videos taken during focus group discussions, key informant interview, during antenatal care or process of delivery, and/or a photo of me with my baby).If you decide not to have my image published, it will not have any effect to your care and If you choose to withdraw your consent for video or photo image any point in time, you will still be entitled to any benefit assigned to you if any.

Acceptance: You----- agree to participate in the above research project conducted by the principal investigator, Miriam Nkangu, under the supervision of Dr. Sanni Yaya and Dr Julian Little of University of Ottawa.

By your signature below/or verbal agreement, you agree to comply with all the research activities as outlined above.

If you have any questions about the research project, you may contact the project investigator at the local number:

If you have any question regarding the ethical conduct of this research project, you may contact the Research Ethics Board at

There are two copies of the consent form, one of which is yours to keep.

For oral acceptance-participant will repeat acceptance statement after the interviewer

Signature

Participant ----- Witness-----

Date ----- Time-----

Project investigator-----Time-----Date

For written acceptance

Signature

Participant -----Witness

Date----- Time.....

Project investigator-----Time-----Date

Appendix Q

Ethical Approval and Administrative Clearances

Université d'Ottawa Bureau d'éthique et d'intégrité de la recherche	29/04/2020 University of Ottawa Office of Research Ethics and Integrity												
CERTIFICAT D'APPROBATION ÉTHIQUE CERTIFICATE OF ETHICS APPROVAL													
Numéro du dossier / Ethics File Number Titre du projet / Project Title Type de projet / Project Type Statut du projet / Project Status Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy) Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)	H-02-19-2829 Examining the effect of performance-based financing on equity in maternal and child health services in Cameroon Thèse de doctorat / Doctoral thesis Renouvelé / Renewed 29/04/2020 15/01/2021												
Équipe de recherche / Research Team													
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 20%;">Chercheur / Researcher</th> <th style="text-align: left; width: 60%;">Affiliation</th> <th style="text-align: left; width: 20%;">Role</th> </tr> </thead> <tbody> <tr> <td>Miriam Nkangu NGUILEFEM</td> <td>Département d'épidémiologie et santé publique / Department of Epidemiology and Public Health</td> <td>Chercheur Principal / Principal Investigator</td> </tr> <tr> <td>Melissa BROUWERS</td> <td>Département d'épidémiologie et santé publique / Department of Epidemiology and Public Health</td> <td>Superviseur / Supervisor</td> </tr> <tr> <td>Sanni YAYA</td> <td>École de développement international et mondialisation / School of International Development and Global Studies</td> <td>Co-superviseur / Co-supervisor</td> </tr> </tbody> </table>	Chercheur / Researcher	Affiliation	Role	Miriam Nkangu NGUILEFEM	Département d'épidémiologie et santé publique / Department of Epidemiology and Public Health	Chercheur Principal / Principal Investigator	Melissa BROUWERS	Département d'épidémiologie et santé publique / Department of Epidemiology and Public Health	Superviseur / Supervisor	Sanni YAYA	École de développement international et mondialisation / School of International Development and Global Studies	Co-superviseur / Co-supervisor	
Chercheur / Researcher	Affiliation	Role											
Miriam Nkangu NGUILEFEM	Département d'épidémiologie et santé publique / Department of Epidemiology and Public Health	Chercheur Principal / Principal Investigator											
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Sanni YAYA	École de développement international et mondialisation / School of International Development and Global Studies	Co-superviseur / Co-supervisor											
Conditions spéciales ou commentaires / Special conditions or comments													
550, rue Cumberland, pièce 154 550 Cumberland Street, Room 154 Ottawa (Ontario) K1N 6N5 Canada Ottawa, Ontario K1N 6N5 Canada 613-562-5387 • 613-562-5338 • ethique@uOttawa.ca / ethics@uOttawa.ca www.recherche.uottawa.ca/deontologie www.recherche.uottawa.ca/ethics													

CERTIFICAT D'APPROBATION ÉTHIQUE | CERTIFICATE OF ETHICS APPROVAL

Numéro du dossier / Ethics File Number

H-02-19-2829

Titre du projet / Project Title

Examining the effect of
performance-based financing on
equity in maternal and child
health services in Cameroon
Thèse de doctorat / Doctoral
thesis

Type de projet / Project Type

Renouvelé / Renewed

Statut du projet / Project Status

Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)

29/04/2020

Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)

15/01/2021

Équipe de recherche / Research Team

**Chercheur /
Researcher**

Affiliation

Role

Miriam Nkangu
NGUILEFEM
Melissa
BROUWERS
Sanni YAYA

Département d'épidémiologie et santé publique / Department of
Epidemiology and Public Health
Département d'épidémiologie et santé publique / Department of
Epidemiology and Public Health
École de développement international et mondialisation / School of
International Development and Global Studies

Chercheur Principal /
Principal Investigator
Superviseur / Supervisor
Co-superviseur /
Co-supervisor

Conditions spéciales ou commentaires / Special conditions or comments

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www.recherche.uottawa.ca/deontologie | www.recherche.uottawa.ca/ethics

Université d'Ottawa

Bureau d'éthique et d'intégrité de la recherche

University of Ottawa

Office of Research Ethics and Integrity

Le Comité d'éthique de la recherche (CÉR) de l'Université d'Ottawa, opérant conformément à l'*Énoncé de politique des Trois conseils* (2014) et toutes autres lois et tous règlements applicables, a examiné et approuvé la demande d'éthique du projet de recherche ci-nommé.

L'approbation est valide pour la durée indiquée plus haut et est sujette aux conditions énumérées dans la section intitulée "Conditions Spéciales ou Commentaires". Le formulaire « Renouvellement ou Fermeture de Projet » doit être complété quatre semaines avant la date d'échéance indiquée ci-haut afin de demander un renouvellement de cette approbation éthique ou afin de fermer le dossier.

Toutes modifications apportées au projet doivent être approuvées par le CÉR avant leur mise en place, sauf si le participant doit être retiré en raison d'un danger immédiat ou s'il s'agit d'un changement ayant trait à des éléments administratifs ou logistiques du projet. Les chercheurs doivent aviser le CÉR dans les plus brefs délais de tout changement pouvant augmenter le niveau de risque aux participants ou pouvant affecter considérablement le déroulement du projet, rapporter tout événement imprévu ou indésirable et soumettre toute nouvelle information pouvant nuire à la conduite du projet ou à la sécurité des participants.

The University of Ottawa Research Ethics Board, which operates in accordance with the *Tri-Council Policy Statement* (2014) and other applicable laws and regulations, has examined and approved the ethics application for the above-named research project.

Ethics approval is valid for the period indicated above and is subject to the conditions listed in the section entitled "Special Conditions or Comments". The "Renewal/Project Closure" form must be completed four weeks before the above-referenced expiry date to request a renewal of this ethics approval or closure of the file.

Any changes made to the project must be approved by the REB before being implemented, except when necessary to remove participants from immediate endangerment or when the modification(s) only pertain to administrative or logistical components of the project. Investigators must also promptly alert the REB of any changes that increase the risk to participant(s), any changes that considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project or the safety of the participant(s).

Marc Alain BONENFANT

Coordonnateur de l'éthique / Ethics Coordinator

Pour/For **Daniel LAGAREC** Président(e) du/ Chair of the **Comité d'éthique de la recherche en sciences de la santé et sciences / Health Sciences and Sciences Research Ethics Board**

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www.recherche.uottawa.ca/deontologie | www.recherche.uottawa.ca/ethics

Lettre d'approbation administrative | Letter of administrative approval
Numéro de dossier / Ethics File Number

H-02-19-2829

Titre du projet / Project Title

 Examining the effect of
performance-based financing on
equity in maternal and child
health services in Cameroon
Thèse de doctorat / Doctoral
thesis

Type de projet / Project Type

 Soins continus Bruyère / Bruyère
Continuing Care

CÉR primaire / Primary REB

Renouvelé / Renewed

Statut du projet / Project Status
Date d'approbation (jj/mm/aaaa) / Approval Date (dd/mm/yyyy)

08/02/2019

Date d'expiration (jj/mm/aaaa) / Expiry Date (dd/mm/yyyy)

15/01/2022

Équipe de recherche / Research Team
**Chercheur /
Researcher**
Affiliation
Role

 Miriam Nkangu
NGUILEFEM

 Département d'épidémiologie et santé publique / Department of
Epidemiology and Public Health

 Chercheur Principal /
Principal Investigator

Sanni YAYA

 École de développement international et mondialisation / School of
International Development and Global Studies

Superviseur / Supervisor

Conditions spéciales ou commentaires / Special conditions or comments:

Bruyère REB Protocol # M16-18-057

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REPUBLIC OF CAMEROON
PEACE, WORK, JUSTICE

FACULTY OF HEALTH SCIENCES- INSTITUTIONAL REVIEW BOARD
IRB0000017- US Office for Human Research Protection (OHRP) IRB0000017-026

Secretary

Professor. Halle Ekane Edie Gregory

Your Ref: _____

Our Ref: 2020/ 1342-02 /U/B/SG/IRB/FHS

Date: 23 MAR 2021

Notice of Ethical Approval

Application number: 1342-02

Principal Investigator: Miriam N. Nkanga

Study Title: Evidence and policy of performance based financing equity program on access and utilization of maternal and child health services towards achieving universal health coverage in Cameroon.

Application Type: Initial

Sponsor: Student

Review Type: Normal

Date of Approval: 23rd March 2021

Expiration Date: 23rd March 2022

Principal Investigator's responsibilities:

1. The study must be conducted in strict accordance with the protocol approved by the Board
2. Changes to the protocol or its related consent documents must be approved by the Board before implementation
3. Adverse events or unanticipated problems must be reported promptly to the Board
4. Participants must receive a copy of the consent document, if appropriate
5. The Principal Investigator is responsible for the on-going conduct of the study. The study must be implemented according to national and international guidelines for the ethical conduct of research on humans. She must collaborate with the IRB's monitoring of the study's implementation.
6. Any future correspondence must include the application number, and the PI's name in the subject line.
7. A renewal application or project closure report must be submitted at least one month prior to the expiration date indicated above. These must be done using the FHSIRB's secretariat AND an electronic copy sent to: irbfhs@gmail.com, making sure to reference the application number indicated above. This form is available at <http://www.healthresearchweb.org/cameroon/institution2139>

Professor Halle Ekane Edie Gregory
Secretary; Institutional Review Board
Faculty of Health Sciences University of Buea



REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie

MINISTERE DE LA SANTE PUBLIQUE

DELEGATION REGIONALE
DU SUD OUEST



REPUBLIC OF CAMEROON
Peace - Work - Fatherland

MINISTRY OF PUBLIC HEALTH

REGIONAL DELEGATION

Regional Delegation

Regional Fund

Buea

Buea the: 22 APR 2021

THE REGIONAL DELEGATE

Email: contact@swrdph.org

Ref: 1211 /MINSANTE/SWR/RDPH/PS

TO: MIRIAM N. NKANGU.
University of Ottawa, Canada
School of Epidemiology and Public Health

SUBJECT: Administrative Authorization to
Collect Research Data

After a careful review of this study presented to us by this student, we are sure that medical ethics will be respected as the collection of data will be overseen by trained personnel after the consent of the participant has been obtained.

With the clarity of her methodology and in view of the importance of this research in generating important information for the better management of patients, we have no objection to her carrying out her research on *"Evidence and policy of performance based financing equity program on access and utilization of maternal and child health services towards achieving universal health coverage in Cameroon."*

I therefore call on the health facilities concerned and the participants to give this student the necessary assistance needed to enable her carryout this study of scientific importance.

For the Regional Delegate of Public Health
And delegation



Appendix R

Knowledge Dissemination and Grants Received During the Course of my PhD Program

Knowledge dissemination activities relevant only to the thesis chapters	Location/year	duration	Role	Outcome
1.Attended International Public Policy workshop	Denver USA/2019	4days	Present thesis structure and policy discussion on thesis	Presented protocol from thesis to public policy audience and received feedback from a public policy perspective
2.International Public Policy Conference	Montreal 2019	2days	Presented ongoing methodology and data collected and co-moderator for a PBF session	Feedback received on components of thesis design and methodology
3.Geneva health Forum	Geneva 2022	3days	Presenter	Thesis systematic review
4.What works Global Summit	Online 2022	1day	Presenter	Thesis systematic review
5.Workshop Cologne	Cologne/2019	3days	Presenter	Workshop on PBF
6. PBF regional office Cameroon	Cameroon 2022	1day	Presenter	Member checking and overall dissemination of main findings from thesis to the PBF team
Grants acquired during the thesis/year	Funder	Country of implementation	Role	Duration and Outcome
Using e-vouchers and mobile phone to improve access to maternal health services in Cameroon 2018	Grand Challenges Canada Stars in Global health for RMNCH	Cameroon	Co-principal investigator and digital health innovator. Led the design and implementation	Implemented 2018-2019. Successfully completed proof of concept
BornFyne-PNMS project. Transition to scale grant based on the outcome of	Grand Challenges Canada Stars in Global Health transition-to-scale	Cameroon	Co -principal investigator. Led the design, acquisition of	Ongoing April 2022-Septemeber 2023

the proof of concept	grant for RMNCH		the grant and currently leading the implementation	
STROBE Equity project	CIHR	N/A	Co-investigator	Ongoing 2021-2024

Appendix S

Selected Publications During my PhD Studies

1. **Nkangu MN**, Olatunde OA, Yaya S. (2017). The perspective of gender on the Ebola virus disease using a risk management and population health framework: A scoping review. *Infect Disease Poverty* doi: 10.1186/s40249-017-0346-7 IDOP-D-16-00312.4). <https://doi.org/10.1186/s40249-017-0346-7>
2. **Nkangu MN**, Okwen PM., Mbuagbaw L. *et al.*(2020). A protocol for a pilot cluster randomized control trial of e-vouchers and mobile phone application to enhance access to maternal health services in Cameroon. *Pilot Feasibility Stud* **6**, 45. <https://doi.org/10.1186/s40814-020-00589-y>
3. Antequera A, Lawson DO, Noorduyn SG, Dewidar O, Avey M, Bhutta ZA, Chamberlain C, Ellingwood H, Francis D, Funnell S, Ghogomu E, Greer-Smith R, Horsley T, Juando-Prats C, Jull J, Kristjansson E, Little J, Nicholls SG, **Nkangu M**, et al. Improving Social Justice in COVID-19 Health Research: Interim Guidelines for Reporting Health Equity in Observational Studies. *International Journal of Environmental Research and Public Health*. 2021; 18(17):9357. <https://doi.org/10.3390/ijerph18179357>
4. Okwen P, **Nkangu M**, Rogoff, Z.(2018) Don't ignore health-care impact of internet shutdown. *Nature* 559, 477: doi: 10.1038/d41586-018-05797-4.
5. Rogers Van Katwyk S, Grimshaw JM, **Nkangu M**, Nagi R, Mendelson M, Taljaard M, et al. (2019). Government policy interventions to reduce human antimicrobial use: A systematic review and evidence map. *PLoS Med* 16(6): e1002819. <https://doi.org/10.1371/journal.pmed.1002819>
6. Venegas CL, **Nkangu MN**, Duffy MC, Fergusson DA, Spilg EG.(2019) Interventions to improve resilience in physicians who have completed training: A systematic review. *PLoS ONE* 14(1): e0210512. <https://doi.org/10.1371/journal.pone.0210512>
7. **Nkangu MN**, Mbuagbaw L, Mathew CM, Okwen P, Adams O, Niba LL, Hatcher Roberts J, Yaya S. (2019). The Effectiveness of Performance-Based Financing interventions across all levels of Health Systems and health sectors in Low-Middle-Income Countries: An evidence and gap map. Title registration published by Campbell Collaboration *September 2019*. DOI: 10.1002/cl2.1055 *Wiley Online Library*
8. Rogers Van Katwyk, S, Grimshaw JM, **Nkangu M**, Mendelson M, Taljaard M, Hoffman SJ.(2020). Study reporting quality among interventions to reduce antibiotic use is a barrier to evidence-informed policymaking on antimicrobial resistance: systematic review, *Journal of Antimicrobial Chemotherapy*, Volume 75, Issue 5, Pages 1091–1098, <https://doi.org/10.1093/jac/dkz540>
9. **Nkangu M**, Little J., Omonaiye, O., Yaya, S. The effect of performance-based financing interventions on out-of-pocket expenses intended to improve access to and utilization of maternal health services in sub-Saharan Africa: protocol for a systematic review and meta-analysis. (BMC Systematic Reviews-Accepted for publication, Manuscript ID SYSR-D-21-00144).

10. **Nkangu M**, Obegu P, Asahngwa C, Shiroya V, Gobina R, Agbaw-Ebai FP, Keboa M, Foretia D. Scoping review protocol to understand the conceptualization, implementation, and practices of health promotion within the context of primary healthcare in Africa. *BMJ Open*. 2021 Dec 2;11(12):e049084. doi: 10.1136/bmjopen-2021-049084. PMID: 34857559; PMCID: PMC8640629.

Knowledge dissemination activities related to the thesis topics

11. **Nkangu M.N.**, Mbuagbaw, L., Okwen, P., Weledji, D., Hatcher Roberts, J., Yaya, S. mhealth intervention to improve maternal and child health in Cameroon. Presented at the Health Technology Assessment Conference, June 19, 2019 Cologne, Germany (published on HTAi website)
12. Evidence Implementation in Performance Based Financing in Primary Healthcare at District Level. HTAi June 2, 2018, Vancouver, Canada. Co-moderator, **Miriam N. Nkangu**. <https://www.htai2018.org/workshops/>
13. Nkangu M, Little J, Omonaiye O, Pongou R, Deonandan R, Geneau R, Yaya S. A systematic review of the effect of performance-based financing interventions on out-of-pocket expenses to improve access to, and the utilization of, maternal health services across health sectors in sub-Saharan. Geneva health Forum May 2022.

Appendix T
Record Keeping: Antenatal Care and Skilled Birth Delivery Registers at a Public Health Facility, Buea



Appendix U

Car Breakdown During Project-Site Training of Health Care Providers on how to Use Digital Platform to Deliver Maternal Health Services, BornFyne-PNMS Project



Photo credit: Glen

Appendix V

List of Countries Implementing PBF in LMIC

No	Country	Population	Estimated current annual Budget 2019	Comment	Start	Phase	Coverage estimate	Phase	Population covered	Feasibility	Supported by
1	Afghanistan	36,300,000	\$ 22,400,000	Requires update	2004	5 years 2014-2018 \$ 112 million	100%	National 100%	36,300,000	High	MOH; WB;
2	Armenia	2,900,000	\$ 6,166,667	Requires update	2003	Piloted in Armenia in late 2003 and discontinued in 2005. Relunched in 2006 and nationwide implementation of RBF was achieved in 2011.	100%	National 100%	2,900,000	High	Government
3	Angola	29,700,000	\$ 5,000,000		2018	In pilot phase	3%	Pilot	800,000	Low	Government, World Bank
4	Benin	12,000,000	\$ 0	Requires update	2011	2011-2017. Pilot started in 2011. Upgraded to 100% in 2015 by combined financing of WB, Global Fund, GAVI and BTC. Reduced to 0% in 2018	0%	Stopped	0		MOH; WB; AEDES; GF; GAVI BTC; Local Firms
5	Burkina Faso	19,200,000	\$ 23,040,000		2013	Scale up covering 60% of the country	60%	Scaling up 60%	11,520,000	High	MOH; WB
6	Burundi	10,800,000	\$ 30,000,000		2006	Started in 2006 in 3 provinces - gradually expanded to national scale in April 2010.	100%	National 100%	10,800,000	High	WB; MOF/MOH; EC; Cordaid; Gavi; Some Bilaterals
7	Cambodia	16,000,000	\$ 10,000,000	Requires update	1998	First pilot started in 1998	100%	National 100%	16,000,000	Moderate	ADB - government
8	Cameroon	24,000,000	\$ 72,000,000		2008	In 2008 in East. 2011 in Littoral 2012 in 3 more regions. Scaled up to 78% of the country by 2018.	100%	National 100%	24,000,000	Very high	WB; Cordaid
9	Central African Republic	4,000,000	\$ 18,000,000	Requires update	2009	2009 1 Prefecture - 2010 6 Prefectures. WB PBF in 2016 40% To scale in 2019	50%	National 50%	2,000,000	Very high	EC; Cordaid; WB
10	Comoros	813,000	\$ 2,500,000	Requires update	2019		100%	National 100%	813,000	Not sure	French Cooperation, WB, government
11	Congo Brazzaville	5,000,000	\$ 8,600,000	Requires update	2012	Pilot started in 2012 with Cordaid	86%	National Restart	4,300,000	Reasonable	WB; Cordaid-Memisa
12	Djibouti	872,000	\$ 4,666,667		2013	Scaling up in 2014 with WB	100%	National 100%	872,000	Moderate	
13	DRC	81,400,000	\$ 70,000,000		2004	2004 South Kivu - 2005-2010 in 4 provinces - Since 2016 PBF started covering 25 million people	25%	National 20%	20,350,000	High	Cordaid - USAID; MSH; WB; EC; GIZ
14	Ethiopia	105,000,000	\$ 1,050,000	Requires update	2011	Started small pilot. Negotiations for set up underway with WB	0.5%	Preparation	525,000	84% according to feasibility study	Cordaid - WB
15	Gabon	2,000,000	\$ 5,000,000	Requires update	2016	Preparatory phase	50%	Preparation	1,000,000	High	GOG
16	Gambia	2,100,000	\$ 2,700,000	Requires update	2014	Implementation	40%	Scaling up 40%	840,000	High	MOH; WB
17	Ghana	28,800,000	\$ 14,600,000	Requires update	2015	PBF project started but with different design only for the community	10%	Preparation	2,880,000	Moderate	WB, Cordaid, SNV KIT
18	Guinea (Conakry)	12,700,000	\$ 8,000,000		2016	Pilot scaling up	20%	Scaling up 20%	2,540,000	High	MOH; WB, KfW, GIZ, Health Focus
19	Guinea Bissau	1,800,000	\$ 2,000,000		2018	Preparatory phase	0%	Preparation	0	Not tested	Govt - WB
20	Haiti	11,000,000	\$ 90,000,000	Requires update	2013	Will start a pilot in several districts	20%	Scale up 20%	2,200,000	High	MOH; USAID; WB
21	Indonesia	264,000,000	\$ 0		2009	Started pilot in 2009 in Flores island	0%	Stopped	0	High	Cordaid
22	Ivory Coast	24,000,000	\$ 6,000,000	Requires update	2012	Scale up phase	10%	Scale up 20%	2,400,000		
23	Kenya	49,700,000	\$ 24,850,000	Requires update	2011	Pilot started in Samburu District in 2011	25%	Pilot	12,425,000	High	MOH, WB, Population Council
24	Kyrgyz Rep	6,200,000	\$ 3,666,667		2013	Pre-pilot phase planned to start in 2nd Q 2013	33%	Pilot	2,046,000	High	MOH/MOF; WB
25	Lao PDR	6,800,000		Requires update	2013	Will start pilot in 5 provinces in 2013	0%	Preparation	0	Medium	MOH; WB
26	Lesotho	2,200,000	\$ 3,200,000		2013	Started in 2013, scaled up 6 district in 2016 and will go national in 2018	100%	National 100%	2,200,000	High	MOH/MOF; WB
27	Liberia	4,700,000	\$ 3,000,000	Requires update	2013	USAID financed PBC project since 2009	20%	Pilot	940,000	High	MOH; USAID ; MSH/JSI; WB
28	Madagascar	25,500,000	\$ 5,100,000	Requires update	2013		10%	Pilot	2,550,000		
29	Malawi	18,600,000	\$ 1,000,000	Requires update	2010	RBF type pilot targeting a limited number of activities	5%	Pilot	930,000		Options Cordaid
30	Mali	18,500,000	\$ 20,000,000		2009		50%	Scaling up	9,250,000		
31	Mauretania	4,200,000	\$ 4,750,000		2019	Pilot	15%	Pilot	620,000		
32	Mozambique	29,700,000	\$ 11,880,000	Requires update	2011	Pilot PBF programs started in 2 provinces in 2011	10%	Not sure	2,970,000	Moderate	USAID; EGPAF; Abt Assoc
33	Niger	21,500,000	\$ 15,400,000		2013		18%	Scaling up	3,850,000	68%	
34	Nigeria	191,000,000	\$ 34,380,000	Requires update	2011	Start end 2011 in three pre-pilot districts; scaling up to three states by 2nd Q 2013. More states gradually joined	6%	Scaling up	11,460,000	High	WB; States
35	Rwanda	12,200,000	\$ 24,400,000		2002	Started from 2002 onwards in three pilot areas, expanded to national level in 2006	100%	National 100%	12,200,000	Successful scaling up 60%	MOH/MOF - PEPFAR-USAID; GF; WB, Belgians and others
36	Senegal	15,800,000	\$ 7,433,333		2012	A USAID financed P4P project started in April 2012 in 3 districts	23%	Scaling up 23%	3,600,000	Reasonable	MOH; WB; USAID
37	Sierra Leone	7,500,000	\$ 6,000,000	Requires update	2011	Started a 'PBF light' program in April 2011 PBF Plus 2015 - Revised program 2018	25%	Not sure	1,875,000	Not sure	MOH/MOF; USAID; WB
38	South Sudan	12,500,000	\$ 0	Requires update	2013	In starting up phase - feasibility study end of 2011 had favorable outcome	0%	Preparation	0	Low	WB; Cordaid
39	Tanzania	57,300,000	\$ 1,146,000	Requires update	2008	Small pilots started since 2008	1%	Not sure	573,000	Moderate	Cordaid; Clinton Foundation
40	Tchad	14,900,000	\$ 0		2011	Pilot started in 2011	0%	Not sure	0	62%	MOH, WB, AEDES, CSSI
41	Togo	7,800,000			2018	PBF program to start	0%	Not sure	0	92%	WB
42	Uganda	42,800,000	\$ 51,360,000	Requires update	2003	Failed WB RBF pilot in 2006. New Cordaid financed pilot since 2009	60%	Scale up	25,680,000	42%	Cordaid - WB - USAID
43	Zambia	17,000,000	\$ 10,200,000		2010	Started in 2010 Cordaid and WB in 10 districts	20%	Scale up	3,400,000	Good	WB - Cordaid
44	Zanzibar	1,300,000	\$ 585,000	Requires update	2012	Start pilot 2013	15%	Not sure		High	MOH, Danida
45	Zimbabwe	16,500,000	\$ 46,200,000		2011	Pilot started in 2 districts	80%	National 86%	13,200,000	High	MOH/MOF WB; Cordaid
TOTALS		1,278,585,000	\$ 676,274,333				20%		252,809,000		

Source: SINA Health www.sina-health.com