Factors influencing the Public Private Partnership Program between International Clinical Laboratories and Public Hospitals in Ethiopia

By

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Declaration

I hereby declare that this thesis work entitled "Factors Influencing Public Private Partnership Program between International Clinical Laboratories and Public Hospitals in Ethiopia", is my personal work conducted with the guidance of my advisor. This work has not been previously submitted or presented to this or any other University or Institution.

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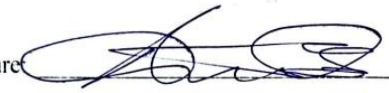
Signature  Date: 18-3-2025

Certification

This is to certify that this thesis entitled "Factors Influencing Public Private Partnership Program between International Clinical Laboratories and Public Hospitals in Ethiopia" submitted by Kirubel Eshetu for partial fulfillment of the requirements for Master of Business Administration degree at the College of Business and Economics, Addis Ababa University, is an authentic work and is appropriate for submission.

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Abbreviations and Acronyms

BOT: Build-Operate-Transfer

COVID-19: Coronavirus Disease 2019

DBFO: Design-Build-Finance-Operate

EPEC: European PPP Expertise Centre

ICL: International Clinical Laboratories

IT: Information Technology

IPMA: International Project Management Association

IBM SPSS: Statistical Package for the Social Sciences

LMIC: Low-and Middle-Income Countries

MD: Medical Doctor

MoH: Ministry of Health

NHIS: National Center for Health Statistics

NGO: Non-Governmental Organization

PPP: Public Partnership Program

TAT: Turnaround Time

UNECE: United Nations Economic Commission for Europe

WHO: World Health Organization

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Operational Definitions

Access to Service: refers to the ability of individuals to obtain healthcare services when needed, which includes geographical availability, affordability, and the absence of barriers such as discrimination or lack of information.

Affordability of Service: indicates the extent to which individuals can pay for healthcare services without financial hardship, often assessed by comparing costs to income levels and considering insurance coverage.

Application of Information Technology: This involves using digital tools and systems to enhance the delivery of services, improve patient outcomes, and streamline operations, including electronic health records and telemedicine.

Client Satisfaction: measures the degree to which patients are pleased with the healthcare services they receive, encompassing aspects such as service quality, provider interaction, and overall experience.

Diagnosis: is the process of identifying a disease or condition based on the evaluation of patient symptoms, medical history, and diagnostic tests.

Diagnostic Service: refers to the range of tests and procedures used to determine the presence or absence of a disease, including laboratory tests, imaging studies, and biopsies.

Effective Communication: is the clear and concise exchange of information between providers and patients, which is essential for understanding treatment options, patient needs, and ensuring adherence to medical advice.

Financial Viability: the ability of a healthcare organization to maintain operations and meet financial obligations over time, ensuring sustainability and the capacity to invest in quality improvements.

Health System: It encompasses all organizations, institutions, and resources that deliver healthcare services to meet the health needs of a population, including public and private entities.

Operational Flexibility: is the capacity of a healthcare organization to adapt to changing circumstances, such as fluctuating patient volumes or new regulations, while maintaining service quality.

Program Success: is defined by the achievement of specific objectives and outcomes set for a healthcare initiative, often measured through indicators such as patient outcomes, efficiency, and stakeholder satisfaction.

Public Health: is the science and practice of protecting and improving the health of populations through education, policy-making, and research for disease and injury prevention.

Public Private Partnership: A public-private partnership (PPP) in healthcare is a collaborative agreement between government entities and private sector organizations to finance, build, and operate healthcare facilities or services, aiming to improve efficiency and access.

Service Turnaround Time: Service turnaround time refers to the duration taken to complete a healthcare service, from the initial request to the delivery of results or treatment, which is critical for patient satisfaction and operational efficiency.

Specimen Referral: Specimen referral is the process of sending biological samples (e.g., blood, tissue) from one healthcare facility to another for further testing or analysis, ensuring accurate diagnosis and treatment.

Timely Payment of Services: Timely payment of services involves the prompt settlement of healthcare bills by patients or insurers, which is essential for the financial health of healthcare providers and the sustainability of services.

Abstract

The global health system faces unprecedented demands due to population growth, urban migration, aging, and chronic illnesses. Diagnosis is crucial for monitoring patients and preventing diseases. Low- and middle-income countries, such as Ethiopia, struggle with issues of affordability and quality in healthcare. Public-private partnerships aim to bridge these gaps by optimizing the resources of both the public and private sectors. This research aims to determine the success rate of the PPP program between International Clinical Laboratories and public hospitals, as well as the factors that influence this partnership.

A quantitative cross-sectional study design was employed to determine the success rate of the PPP program and identify factors influencing program success among clinicians and hospital managers working in public hospitals. A total of 185 participants were involved in this study. The collected data were analyzed to assess its internal consistency using Cronbach's Alpha, following Hair's (2014) recommendation that a value of .70 or higher indicates an acceptable level of consistency. Multi-variate logistics regression was applied to assess the relationship between the independent and dependent variables with a significance level set at P <0.05. Data analysis was conducted using IBM SPSS Version 22.0 for the analysis.

The overall proportion of public private partnership program success was 63.2% (95% Confidence interval (CI): 56.2–69.7). Female sex (AOR) = 2.9, 95% (CI) (1.1–7.8), p = 0.039), service accessibility (AOR = 3.6, 95% CI (0.98–13.5), p = 0.045), presence of operational flexibility (AOR = 2.7, 95% CI (1.1–6.8), p = 0.035), and application of Information technology in service delivery (AOR = 4.5, 95% CI (1.5–14.0), p = 0.009) were significantly associated with PPP program success (P<0.05).

The success of Public-Private Partnerships (PPPs) in the diagnostic business is influenced by gender dynamics, improved service accessibility, operational flexibility, and the use of information technology. Further studies are needed to complement quantitative findings with in-depth qualitative analyses involving key stakeholders to better understand additional potential hidden factors that may influence the success of PPP program.

Keywords

PPP Program, Service accessibility, Operational flexibility, Information Technology.

Chapter One

1. Introduction

1.1. Background of the study

The global health system faces unprecedented demands due to issues like the increasing population, mass migration to cities, a rapidly aging population, and the rise of chronic illnesses being the potential risks (WHO,2023). The desire to narrow the gap as well as the need to improve service sustainability, did grow the global health sectors explosively. Uncertainty in the economy and the impact of pandemics, like COVID -19, which showed inadequacies in health infrastructure and service delivery as well as inspiring innovation and cooperation, exacerbate these pressures even further (OEDC, 2022).

The manner in which health service is being revolutionized by technological developments notwithstanding these obstacles. To enhancing access for high-quality care digital health technology like artificial intelligence, tele medicine and mobile health apps are some examples and they became more important. Innovations in diagnoses which involve powered by AI examination, Molecular diagnosis, and testing at the point of care are radically improving both the accuracy and speed of disease detection and management (Smith et al.,2022). Countries with low and middle incomes, where an absence of financial resources frequently renders it challenging to improve High - quality health care, are going to benefit significantly though the advancement in technology.

Practical Health care systems is centered on diagnosis, that are vital to monitoring patients, preventing disease and implementing public health activities. Early identification of diseases, evidence-based treatment choices, and patient outcomes are better achieved through accurate diagnostic services. Also, they play an important role in the response to public health emergencies such as pandemics and epidemics in which prompt diagnosis is required for management and containment (WHO,2022).

Regardless of the globally recognized important is diagnosis service, many countries with LMCs including Ethiopia face difficulty to ensure the diagnosis accessibility affordability and quality.

These challenges are multifaceted and include shortage of human resources, financial limitation and poor infrastructure. In Ethiopia, one of the cases is that no modern diagnostic technology can be found because rural areas are often left out and no basic diagnostic facility is available in such situations. Aside from this, the bad scenarios are also made worse by the lack of screening professionals. The health system is therefore unable to offer quality and timely services. (Fekadu et al., 2023). This problem, are worse by a shortage of trained professionals, which restricts the health system's ability to provide prompt and accurate diagnosis service (Ruhangaza & Teshome, 2023).

One of the strategies of innovation that have earned acceptance for addressing the gap in this regard is the use of the public-private partnership. By resource sharing, identifying and mitigating risk, and the integration of technology with knowledge PPPs, provides the corporate framework which allows for the public and private sector to enjoy the benefits of both the public and private sectors (Abuzaineh et al., 2023). PPs have been shown to be effective worldwide in the improvement of health services or their provision, especially in diagnostics. In this case, private organizations frequently offer cutting-edge technology, operational efficiency and funding for investment (Donahue & Abebe, 2023).

In Ethiopia, the collaboration between public hospital and International Clinic Laboratories (ICL) offers an engaging demonstration of the potential effects of the PPP model. Though programs such as training programs, infrastructure expansions, technology integration, ICL, one of the leading suppliers of the diagnosis service, has partnered with public hospitals to increase access to diagnostic services. However, the disparities in pricing public options regarding the role of the privet sector and budgetary limitation in the public sector.

This study investigates the factors influencing in Public- private partnership models within the healthcare sector of Ethiopia with emphasis on the collaboration between ICL and Public Hospital. This research attempts to offer more insights for PPPs optimization by examining governance frameworks, finance processes, stakeholder participation, and service delivery outcome. The research finding expected can use us the guideline for policy maker, health care provider and private investors and address health care issues in settings with limited resource and guarantee fair and long-term access to diagnostic services.

1.2. Statement of the Problem

The foundation of any capable and reliable healthcare system is accessibility as well as reliability of the diagnostics services. On the contrary, in developing countries, this part of healthcare faces numerous barriers which impede due to the complexity of the problems, and it leads to the fact that the service cannot be administered fairly, and diseases are managed inefficiently. These troubles are very widespread in countries with limited possibilities, such as Ethiopia, which has the capacity to increase in the event of healthcare inequality.

One of the biggest challenges is the lack of quality infrastructure. Most countries of the third world, Ethiopia among them, lack laboratory diagnostic technology and medical equipment. These deficiencies inhibit the availability and accessibility of diagnostic services at almost any level of care, consequently excluding a large part of the population from life-saving healthcare (WHO, 2013). Besides, very few human resources present another problem. Ethiopia, on the same note as majority of low-income countries, is on the scarce side with the number of trained lab technicians, pathologists, and the workmen. This human resource gap also increases the inability to provide accurate timely diagnostic services (Assefa & Lakew, 2020).

Another standalone hurdle emerges with financial barriers. Diagnostic tests, equipment, and supplies with inflated prices impose a significant burden on both individuals and healthcare systems. In Ethiopia, which is characterized by a major part of its population living in poverty, the high costs of these procedures render the attainment of the services offered by the related companies an unachievable objective for many people (Peeling et al., 2014). However, regional imbalance also contributes to the problem as in rural and remote areas limited transportation infrastructure and the concentration of diagnostic facilities in urban centers make them bear most of the burden (Kebede et al., 2018).

Quality assurance is a persistent problem beyond the financial and infrastructure barriers. Thus, the diagnostic services cannot guarantee accuracy and reliability as there is no standard quality control programs and profiling of health care workers. The lack of standard patient handling procedures in one of the healthcare facilities is one of the reasons for the health crisis (Nkengasong et al., 2010). The situation is also worsened by the inadequate knowledge of the public through

poor health education about diagnostic services, so patients still underuse the available providers. A high proportion of people, especially those from rural areas do not get the benefits of doing diagnostic testing program or cannot accept it as one of the items to be done (Mboya & Massambu, 2018).

This kind of difficulty has severe consequences not only for individuals but also for the whole people of humanity and the health care systems in general. Insufficient accessibility to diagnostic services is the reason of delaying the disease detection period and the treatment starting, which often leads to the advanced disease stages and, consequently, worse health outcomes (WHO, 2016). Cancer and diabetes chronic diseases, and also infectious diseases with the advanced stage without treatment are a frequent reality which diminishes the force of therapy and system overload will be solved (Okeke et al., 2005). Moreover, misdiagnosis and improper treatments are quite prevalent as a consequence of the absence of reliable diagnostic services that, in turn, cause ineffective therapies and probable harm to the patients (Chanda-Kapata et al., 2018).

The consequences for the economy are also quite damaging. The costs of inadequate diagnostic services are inflated due to more extensive treatments, which may require longer hospitalizations and advanced disease stages to be managed. For low-income patients and healthcare systems by now pressured to the limits, these expenses are usually unbearable (Sodhi et al., 2015). In addition, the lack of diagnostic services has further implications for public health and thereby lessen disease surveillance, delay outbreak detection, and make preventive measures less effective (WHO, 2016).

In Ethiopia, these challenges are particular: it is difficult for a person to delay diagnosis and to begin treatment which is patient's rights, sometimes it can be very dangerous, a person owning livestock might develop diseases that endanger lions, when do we find out that this has expired of medicine or a medical supply that cannot be stored or transported under insufficient conditions, this is one of the ways the world is made worse due to poverty, (Assefa et al., 2018) witnesses that Chronic and infectious diseases usually develop into the life-threatening situations because of the insufficiency of diagnostic facilities. In this case, also, the chronic unemployment that they cause is terrible.

Chronic illness often becomes more severe when diagnostic services are inaccessible. Many people only seek hospital care in last or near the end stages of their illnesses, which makes the treatment not only more difficult and expensive but also causes the healthcare costs to shoot up and the time of sickness to become longer, adding to the pressure on the health system in Ethiopia (Berhanu et al., 2018; Tilahun et al., 2019). The government efforts in the area of healthcare services have been very much affected, in addition to the poor diagnostic services that compromise the surveillance of infectious diseases and the adequate implementation of the preventive measures. This in turn leads to the increase of disease infection rates which are a serious threat to the public health of Ethiopia (Fekadu et al., 2020; Beyene et al., 2017).

Addressing these common points means developing the best technology and system that makes the tone affordable as a major factor for defining the quality of treatment and services. Public-private partnerships (PPPs) promise to bridge these gaps effectively by making the best use of public and private sectors. This is the case for an initiative implemented by the International Clinical Laboratories (ICL) and public hospitals in Ethiopia. Through utilizing various resources, knowledge, and infrastructure, this collaboration can offer the help of patients' tests moving forward, it can also fill the existing gaps of healthcare system in Ethiopia.

The research was aimed to determine the success-rate of the PPP and factors that influenced the partnership between ICL and the Public hospitals. By analyzing the elements that ensure the effectiveness of the partnerships, the research provided recommendations, that would definitely bring the diagnosis closer to users, make it affordable, and improve quality of diagnosis within the overall patient care paradigm.

1.3. Research Questions

The aim of this study is to inspect out the dynamics, barriers, and facilitators in the public-private partnerships in Ethiopian healthcare center, particularly examining the collaboration between International Clinical Laboratories(s) and public hospitals. The research also wants to answer these critical questions:

A. What is the level of the public-private partnership model between International Clinical Laboratories and public hospitals?

B. What are the main factors that influence the public-private partnership (PPP)?

1.4. Objective of the study

1.4.1. General Objective

To analyze the public-private partnership business program success between the International Clinical Laboratories (ICL) and public hospitals on the diagnostic services in Ethiopia

1.4.2. Specific Objectives

- To evaluate the Public-Private Partnership program success level
- To determine factors influencing the Public Private Partnership program success

1.5. Significance of the study

Studying the public-private partnership (PPP) program in access to diagnostic services in Ethiopia is of great significance for multiple stakeholders. It offers opportunities to overcome challenges in accessing diagnostic services, especially in underserved areas, by exploring innovative approaches within the PPP framework.

Recognizing that significant resources flow in any PPP program, the end result is crucial to impact public needs in a sustainable manner. The success of the PPP program motivates both government as well as private service provider to pursue more engagement and drives towards universal access to healthcare. However, the success of PPP programs can be influenced by several factors, depending on the type of industry. This study identified key factors that determine the success of the existing PPP program between the International Clinical Laboratories and Public Hospitals in terms of providing advanced diagnostic services for communities which were underserved for several years.

As the government of Ethiopia seeks to further test the PPP program in accessing diagnostic services in different hospitals, the finding from this study will greatly benefit the strategic design and implementation of the program. Furthermore, local and foreign investors, researchers, or any other stakeholder with an interest in this area will definitely benefit from this study.

1.6. Scope of the study

The scope of this study focused on assessing the success rate of the Public Private Partnership Program and factors influencing the success of the program in accessing diagnostic services. The study specifically targeted the public hospitals and the partnered private diagnostic company, International Clinical Laboratories. The primary participants included clinicians, service coordinators, and hospital managers. By employing a quantitative method, the study gathered in-perceptions of users, as well as provided statistical evidence of the effectiveness of the PPP program implemented between the Public Hospitals and the International Clinical Laboratories.

Chapter Two:

Review of Related Literatures

This chapter provides a comprehensive review of existing literature relevant to the study, with a focus on public-private partnerships (PPPs) in healthcare system and settings. The purpose of this literature review is to synthesize current knowledge, identify gaps, and establish a foundation for examining the factors influencing PPP program in Ethiopia, specifically between International Clinical Laboratories (ICL) and public hospitals.

The scope of the review covers global and regional perspectives on PPPs, the role of diagnostic services within healthcare systems, and the challenges that low- and middle-income countries (LMIC) face while implementing PPPs. The review places the study in a broader context through an examination of theoretical foundations, practical applications, and comparative insights that form the basis for an understanding of the dynamics, barriers, and facilitators of PPP success in Ethiopia.

The structure of this chapter is such that, after setting a theoretical framework highlighting some of the important theories and models related to public-private partnerships (PPP) and health systems, which forms a foundation for understanding the conceptual basis of this study, a general overview of PPPs in health presented. Examples of successful PPPs in health for various countries are given, together with challenges usually associated with such collaborations.

The chapter thereafter discusses the importance of diagnostic services in healthcare systems and their role, challenges, and opportunities, especially in resource-poor settings. Further discussion on PPPs in Ethiopia's healthcare sector is also included, with a focus on the partnership between International Clinical Laboratories (ICL) and public hospitals. Accompanying this is the critical review of the success factors of PPPs by placing emphasis on enabling and hindering factors.

Moreover, analysis is done to match the Ethiopian PPP models against international models for lessons and insights for improvement to be drawn. The chapter further identifies the literature gaps in what exists, especially regarding effectiveness and sustainability issues in the Ethiopian healthcare sector. It concludes by providing insight into informing the design and methodology of the study, while laying the foundation for the subsequent chapters.

2.1 Theoretical Review

Public Private Partnership- General Concept

Public-Private Partnerships (PPPs) constitute a form of collaboration involving both the public and private sectors and are more so aimed at achieving mutual objectives, especially in the form of public goods and services. These ventures capitalize on the strong points of both sectors to overcome the challenge of resources, enhance service delivery, and further innovations. Hodge and Greve (2007) provided a detailed outline of the contractual arrangements that are part of PPPs, which make it easy for the partners to assess their roles and duties, risks, and rewards. In doing so, the contracts are not merely transnational, but their purpose is to align the objectives of both sectors, increase responsibility, and, accordingly, ensure the achievement of the objectives that have been agreed upon prior.

Hodge and Greve (2007) stress the importance of performance monitoring for the of PPPs. Unlike traditional public service models, PPPs require a multi-dimensional approach to monitoring including financial performance, service quality, timeliness, and stakeholder satisfaction. Thus, regular assessment and feedback systems ensure that both partners are on track with the given project's objectives, are well equipped to handle ranking, and can endeavor to find solutions for emerging challenges. This dynamic feature of performance management is a contributor to the partner's ability to the adaptability and sustainability of the partnership.

While PPPs do offer a number of very important advantages, they do raise some challenges like complex contract negotiation, at times too long and costly as well as public perception and issues of trust, as involvement by private operators may lead to skepticism on transparency, affordability, and accountability. Regulatory hurdles, such as inconsistencies in legal and regulatory frameworks, raise the complexity of project development and management. To counteract these aforementioned challenges, Hodge and Greve (2007) suggest a holistic approach should be used that embodies stakeholder consultation, regular performance reviews, and the pursuit of long-term value.

Public-Private Partnerships introduce a new approach to the challenges facing the public sector, bringing efficiency and innovation from the private sector on one hand and regulation and oversight provided by the public sector on the other. A sound contractual framework underpinning governance and performance monitoring are all key to successful and sustainable PPPs.

Benefits of Public-Private Partnership

Public-Private Partnerships (PPPs) have enormous leeway to deliver a broad range of benefits through the matching of complementary strengths of the public and private sectors. They are particularly beneficial in those situations where the public sector has resource constraints, operational inefficiencies, and difficulties in the delivery of basic services. From a TCE point of view, PPP helps to reduce high transaction costs most commonly related to public sector involvement by bringing into play efficiency, innovation, and management of risks developed in the private sector (Donahue & Zeckhauser, 2011).

The major advantage of PPPs is that they provide efficiency. In this regard, the partnership blends the operating experience, innovativeness, and ingenuity of the private sector players along with the governance, regulative oversight, and public accountability of public institutions. The resulting process yields efficiency, economy, and effectiveness. According to Osbor and Brown, "The very act of integrating and linking these resources can also provide opportunities for each sector beyond those available to it in isolation" (2005).

Another major advantage is access to resources of the private sector. Private partners bring in big financial capital, advanced technologies, and special skills not necessarily available in the public sector. Such contributions help in bridging gaps in funding, accelerating project implementation, and raising the capacity of infrastructure and public services' development. Yescombe (2007) and Koppenjan and Enserink (2009) stress that such partnerships allow the public sector to pursue projects that would otherwise be delayed or limited by budgetary constraints.

Other benefits of PPPs include the risk-sharing and -management aspect. By passing off certain risks, such as construction, operational, or demand risks, onto the private sector partner, the public sector decreases the financial burden while benefiting from the expertise in the private sector on how best to manage these risks. According to Grimsey and Lewis (2004), not only does this mitigate risks, but it also motivates the private partners to make sure the project works, hence raising efficiency and overall outcomes.

PPPs prove their distinct features through innovation and flexibility as they are distinguished from traditional models of public service delivery. When private sector partners are brought in, they are motivated to devise methods and strategies that will provide the necessary project outcomes on time and possibly add the least possible cost. An undertaking of this kind generally concludes with

a few important changes, the most obvious of which are new and originally designed infrastructure and better decisions stemming from process flow. Yescombe (2007) and Osborne and Brown (2005) claim that flexibility is the bedrock for PPPs to overcome changes in the environment and the rising needs of the public.

Moreover, PPPs prioritize service quality and performance that is sustainable through the establishment of contracts that incentivize the private partners to conduct their operations in accordance with high standards. Performance-based contracts and service level agreements containing clearly defined performance indicators, benchmarks, and monitoring mechanisms are put in place to ensure accountability. Koppenjan and Enserink (2009) and Yescombe (2007) pinpoint that the adoption of such performance-based metrics creates an enabling environment that ensures the consistent and constant delivery of high-quality services throughout the entire duration of the partnership.

These benefits cut across in several other areas, such as the health, education and infrastructural sectors. In the health sector, PPPs have played a big role in the accessibility of diagnostic services, hospital infrastructure and technology. These are top healthcare delivery methods that are a win-win-the environment of the quality of service as well as the population's health concerns are comfortably addressed in a multifaceted and sustainable way.

PPPs result in significant outsourced work being processed through private entity support, involving three areas: a quantum leap in efficiency, the mobilization of significant private sector resources and partnerships, as well as effective risk management and the promotion of the innovative climate at the same time. In one word, the quickly increasing sharing of roles between public and private actors - especially in areas with few resources - emerges as the most impactful of the PPP's multiplying effects on society. Still, at the same time, the existence of a clear contractual framework, good management, and constant observation will be major contributors, that they actually meet each other.

Public Private Partnership models

Public-Private Partnerships (PPPs) involve various forms that are chosen based on the nature of the project, private sector involvement, and the division of the risks and responsibilities between the partners. These forms make it possible to adjust partnerships with respect to the project mission and to deal with the existing structural and sectoral challenges. The choice of a suitable PPP model

is the most important factor in the success of the collaboration, which is the reason for the determination of the roles of each party and the mechanisms for achieving desired outcomes.

One widely used model is the concession agreement where private sector entities finance, design, build, operate, and maintain infrastructure or provide services for a specified period. Under this model, private partners recover their investments through user fees or government payments. Concession agreements are particularly effective in attracting private investment and transferring operational risks to the private sector. Nevertheless, they are also riddled with issues such as tariffs under the right level and management of long contracts as well as proper control or regulatory oversight will be the real complications for them. Grimsey and Lewis (2004) mention that although concession agreements can lead to efficiency development, they require good governance mechanisms that will protect public interest in this matter.

Another frequently utilized PPP model is the Build-Operate-Transfer (BOT) setup. In this model, the private sector designs, assembles, and manages a facility for a certain amount of time, after which the ownership is handed over to the public sector. Additionally, the use of BOT projects encourages initiation and risk transfer between the private and public sectors, which in turn ensures the use of the most effective methods to complete the project. The author argues that while it is a win for the public by having the private sector participate in the process, it is also a complex process that requires negotiation, clear revenue-sharing dealings and a supportive legal environment.

The Design-Build-Finance-Operate (DBFO) model consolidates various tasks into a single agreement. The private sector is given responsibility for, among other things, contracting, financing, and project maintenance. Generally, these arrangements are long-term in nature. This comprehensive approach, by its nature, fosters better coordination, reduces project delivery time, and takes advantage of private sector skills.. Nevertheless, there are challenges like the attainment of transparency, accountability and value of money in procurement processes that should be addressed. Hodge and Greve (2005) claim that DBFO models need stringent contractual agreements to curb the conflicts of interest that often arise in this type of business and to make sure that the project objectives of the parties are aligned.

Service agreements constitute another form of PPP, which involves the outsourcing of the private sector the provision of specific services such as Maintenance, cleaning, or the like information technology. These contracts consist of short-term agreements focused on the funnels of cost

savings and operational effectiveness. In addition to providing professional competence and becoming time-flexible, service contracts are pressed by the need for clear performance indicators and consistent service quality to be constantly increased through monitoring of performance (Grimsey & Lewis, 2004).

Joint ventures encompass the creation of a partnership between public and private firms to mo-core and develop one project. Resource sharing, distribution of risk, and collaborative decision-making can be facilitated by joint ventures. Koppenjan and Enserink (2009), argue, that these joint ventures can reinforce innovation and interests' convergence. However, there are challenges, such as the management of the conflict of interesting, integration of diverse organizational cultures, and establishment of the effective governance mechanisms.

The selection of the PPP model is a matter of the degree of project complexity, revenue generation potential, risk scenario, and the level of public sector control sought. Each model comes with its own weaknesses and strengths, hence one has to adjust the structure to the unique requirements and goals of the project. For example, the contract for concession and the BOT structure are the two models that are most suitable for revenue-generating projects, while the contracts for service and joint ventures are the ones that will work best for the projects that will be for creating the efficiency of operation and will foster the collaboration of different partners.

In the healthcare sector, PPP models have been adapted to solve the systemic challenges such as the lack of infrastructure, limited diagnostic services, and the allocation of resources in an ineffective way. For instance, the BOT and DBFO models were utilized in establishing a diagnostic facility, then, joint ventures facilitated the cooperative work between the healthcare service providers. These models allow governments to use the private sector resources and knowledge to improve access to the high-quality health care services, especially in settings that lack necessary resources.

PPP models supply a variety of techniques for planning public-private partnerships particularized for each project challenge and demands. Those models will be ful when the tender selection is performed wisely, the governance is strong and the contracts are balanced between the public and private sectors. Proper recognition of the benefits and liabilities of each model is what will guide the governments and the private sector in targeting their partnerships at attaining the sustainable and significant results.

Perspectives on Public-Private Partnership Programs

The implementation and of PPPs are based on several theoretical frameworks that provide explanation on the dynamics, challenges, and opportunities presented by such collaborations. These theories are intended to explain the inner driving mechanisms of PPPs that guide their design, implementation, and evaluation. As described by Klijn, E.H. (2022) and Williamson, 1985, Resource Dependency theory, Institutional theory, Public Value theory, Transaction Cost Economics theory, and Principal Agent theory are the major theories. Each one of these theories looks differently at the analysis of PPPs by putting a different emphasis on aspects of collaboration and governance.

Resource Dependency Theory focuses on the interdependence between the public and private sectors. This theory postulates that organizations form partnerships to obtain resources they lack but are important for organizational survival. These may be related to financial capital, technological expertise, and operational efficiency contributed by the private sector, while the regulatory frameworks, market access, and legitimacy emanate from the public sector in a typical PPP.

The focus of institutional theory revolves around formal and informal norms, rules, and regulations as the key determinant for designing and implementing the different shapes of PPP. Based on institutional theory, it could be said that legal, policy, and cultural settings influence the final destiny of a PPP. A properly fitted legal and regulatory regime might ensure confidence and reduce uncertainty in joining private sector entities to full participation in PPP projects (Wiliamson, 1985 and Eisenhardt, 1989)..

Public Value Theory provides an overall perspective, focusing on the outcomes regarding society as a whole through the PPPs. This theory maintains that any PPP should be basically committed to delivering public value by accessible and affordable high-quality services. In terms of accountability, transparency, and stakeholder engagement, Public Value Theory tends to a large extent to assure the alignment of PPP activities in accordance with societal goals. The theory, for instance, in the health sector, underlines that such PPPs should be developed on systemic challenges like inequities in health care, limited access to diagnostic services, and infrastructure, but with full consideration of the public health objectives.

Other theoretical perspectives include the transaction cost economics and principal-agent theory. Transaction Cost Economics looks into the costs of coordination and management of PPPs, including negotiation of contract, performance monitoring, and risk management. The theory helps in the identification of the most efficient governance structure by minimizing the transaction cost with project outcomes. Principal-Agent Theory (Rodrigues, 2023), in turn, looks into the relationship between the public sector as the principal and the private sector as the agent. It pinpoints problems such as information asymmetry, moral hazard, adverse selection, among others where interests of the two parties will not be aligned.

Furthermore, The Transaction Cost Economics theory, explores the relationship between a principal (public-sector) and an agent (the private-sector partner) and how this relationship can be structures to align their interests and maximize outcomes. It addresses issues such as information asymmetry, moral hazard, and adverse selection in the design and implementation of healthcare PPPs (Eisenhardt, 1989). These theories not only guide the design and implementation of PPPs but also inform their evaluation, ensuring that they deliver tangible benefits to all stakeholders. Putting together, these theoretical perspectives provide a comprehensive framework to explain the dynamics of PPPs.

Factors Influencing Public-Private Partnership programs

While the Public-Private Partnerships have several advantages, they still face critical barriers in their implementation and sustainability. These are political, financial, regulatory, and social dimensions that are generally exaggerated in resource-constrained settings. Knowing these barriers helps in formulating appropriate strategies aimed at overcoming them for enhanced potential.

Among the PPPs, political and regulatory challenges are widespread. The shifts in the government's priorities, political instability, and complicated regulatory conditions might entail risk and negatively affect the private sector from getting involved. Bureaucratic delays and red tape in the project approval processes often lead to inertia and financial costs. In their research, Grimsey and Lewis (2004) present inconsistency in regulatory environment as the major impediment for investors, and regular shifts in policy as the cause of halted or deserted projects. The solution to these problems involves stable policies, clear rules, and less transport-related

administration to provide the pre-competition stage of the private sector in the private sector with a predictable context.

Another crucial risk to PPPs involves finance and economy. The rare availability of long-term financing and high borrowing costs with its macroeconomic uncertainties keep private investors away from investing in big projects. This, however, is compounded by resource-limited settings where projects cannot usually be financially viable, particularly those with low revenue-generating potential. According to Yescombe (2007), the inadequacy of risk-sharing mechanisms is one of the factors contributing to these challenges in PPP, where one party bears high risks that may undermine the viability of the partnership. Novel financing models can be created for such risks, including blended finance or risk-sharing agreements.

The lack of institutional capacity in the public sector entities also has a dampening effect on the effectiveness of PPPs. The lack of proper expertise, resources, and project management capabilities affects the planning, negotiations, and implementation of PPP projects. Most public institutions struggle to cope with the complexities of managing PPP contracts, including performance monitoring, risk allocation, and conflict resolution. Grimsey and Lewis (2004) highlight that 'capacity building through training, knowledge, and collaboration with more mature partners' is required if PPPs are to achieve their promise.

Public resistances and stakeholder resistances are another level of bottlenecks. Private investments in the delivery of public services engender a fear of privatization whereby such services may not be as easily affordable, or their quality compromised as a result. This is partly because the opposition, coupled with distrust in the motives of the private sector, adversely affects project delivery and results in resistance to the implementation of projects. Koppenjan and Enserink (2009) illustrate that for this reason, communication over these issues among stakeholders will facilitate the building of support for PPP projects. Outreach to the communities for consultation on issues, decision-making inclusiveness, and involvement can create trust and congruence with what is publicly expected.

Legal and contractual challenges are yet other difficulties in the implementation of PPPs. The complexities associated with time-consuming contract negotiations, ambiguities in regulatory provisions, and inadequate dispute resolution processes make the transactions uncertain and costly. The complexity in legal frameworks and lack of standardization in PPP contracts often produce

inefficiencies and conflicts. According to Hodge and Greve (2005), clarity, enforceability, and specification of roles, responsibilities, and performance requirements underpin the contracts, besides having mechanisms for resolving disputes efficiently.

Other barriers include the complexity of structuring projects and the procurement process, which deters investors from the private sector. Developing robust project structures requires a lot of time and resources, just like other activities such as feasibility studies and preparation of procurement documentation. Limited transparency in processes of procurement and concerns over cost overruns and delays further erode confidence in PPPs. Furthermore, lack of long-term policy consistency and resistance from the public sector to change restrict consideration of new types of innovative PPP models. These challenges are indicative that what is important is strong leadership, effective governance, and consistent policy support in laying down the enabling environment for PPPs.

These multidimensional barriers to Public-Private Partnerships at all levels touch on political, financial, regulatory, institutional, and social spheres. It thus demands coordinated responses by policymakers, private sector partners, and other key stakeholders. By creating stable regulatory environments, improving institutional capacity, consulting stakeholders, and introducing innovative financing and governance mechanisms, PPPs can surmount these barriers and realize their full potential in the provision of sustainable public services.

Public-private partnership- User perspective factors

As this is a partnership that has a win-win approach, the user, which is the public sector, also observes the partnership from their primary interest perspective. They prioritize factors including reliability, safety, convenience, affordability, efficiency, and ease of access to the service. In a nutshell, ensuring accessibility and quality is critical for satisfying the needs of the service users (Grimsey & Lewis, 2004).

The users expect affordable and reasonable pricing structure for the services rendered to ensure that it remains accessible to all segments of the community. This results in equitably shared benefits of the PPP projects or prgrams (Yescombe, 2007).

Beyond the affordability of the services, the users also greatly value the continuity and reliability of the services throughout the time. They expect uninterrupted services and timely response when service fails due to different reasons. This is part of the performance review that the users

continuously tracks for them to be able to make informed decision for whether the contract to be renewed or not (Hodge & Greve, 2005).

Moreover, users also are concerned with the mechanism for expressing their opinions, raising concerns, and providing feedback on the quality of services. Such a system can enable them to actively engage and improve service delivery model and process, ultimately ensuring that their needs are met (Koppenjan & Enserink, 2009).

Thus, in general, the service users expect, accessible, quality, affordable services in the implementation of PPP projects or programs. The partnership cannot be effective without the continuity and reliability of services and mechanism to provide feedback and express satisfaction throughout the duration of project or programs.

Public Private partnership in health care services

Public-Private Partnerships in health have increasingly been considered a way to address the systemic issues that include, but are not limited to, inappropriate infrastructure, lack of access to diagnostic services, and ineffective resource allocation. A public-private partnership will enable governments to raise the quality, accessibility, and affordability of healthcare services, particularly in resource-poor settings, by leveraging comparative advantages on both sides (Joudyian, 2021).

Apart from the above-mentioned complexity, the healthcare sector thus uniquely and fundamentally offers a host of other opportunities and challenges to both the private and public entities taking part in a PPP agreement. This is the one sector that must always reconcile financial sustainability with the social objectives of health policies on equity and access. WHO, 2016, listed three major models for PPPs in health: health facility management, specialized clinical and diagnostic services, and integrated service delivery models. Each model answers different needs in healthcare and proves the flexibility of PPPs within this sector.

The WHO has three models of healthcare Public-Private Partnerships (PPPs): specialized clinical and diagnostic services, health facility, and integrated models. Model 1 involves private operators providing specialized services over a 4-10 year period, while in Model 2, private operators overseeing health facility design, construction, financing, and operation. Whereas, the integrated model, which involves private operators managing both clinical and non-clinical services (WHO, 2023).

Specialized clinical and diagnostic services aim to enhance access to highly specialized medical technologies and expertise. Special services may be provided by the private partner and could include laboratory diagnostics, imaging, and telemedicine, usually for a fixed contract period. These are especially valuable in low- and middle-income countries where, because of lack of finance, public healthcare systems cannot invest in modern diagnostic facilities. For example, BOT and DBFO models have been implemented to establish diagnostic centers with the latest technology that helps in early detection and management of diseases (Mialon, 2016).

Al-Mazrou et al provided their critique on the public-private partnership (PPP) model in hospitals. They highlighting the need for rigorous evaluations to assess its impact on healthcare quality and cost-effectiveness. The study highlights the potential benefits of PPPs, such as improved infrastructure and specialized services, but also acknowledges the challenges of managing partnerships, accountability, and potential conflicts of interest (Al-Mazrou et al, 2023).

Public Private Partnership (PPP) in Health care: sector-specific factors

There are several challenges to implementing public-private partnerships (PPPs) in healthcare services that can be categorized into legal impediments such as time-consuming processes and constant changes in laws, environmental factors that include lack of transparency and accountability, technological barriers like lack of qualified professionals, and stakeholder confusion from frequent changes in legal and regulatory frameworks (Al-Hanawi, 2020 and Rama, 2015).

Resource allocation remains one of the key challenges in PPP implementation as it can be difficult to allocate resources optimally between the public and private sectors. This is not easy because, as Pauline (2015) rightly point out, balancing tasks, risks and arguments financing is very difficult. Another challenge for is human resources management as the ability to manage skilled personnel and their alignment towards PPP goal is important (Basabih, 2022).

The important challenges in the implementation of PPP include human resources management, financial constraints and information system integration. Solution to ensure successful PPP in involve alignment of skill set and communication with stakeholders about their requirement in the PPPs, providing enough funding for full coverage, especially in remote areas and poorer

socioeconomic locations, as well as focusing on geographical inequalities (Beckers,2021). These challenges underscore the importance of careful planning, stakeholder engagement, and strong legal frameworks to enable ful PPPs in healthcare.

Public Private Partnership in access to diagnostic services

Public-private partnerships (PPPs) can improve healthcare access to diagnostic services by collaborating between public and private providers, facilitating infrastructure development, technology improvements, and service delivery models. They can also explore innovative financial models, improve data sharing, and support public health initiatives and disease surveillance (WHO, 2023).

Public-private partnerships for access to diagnostic services require appropriately tailored policies and procedures, robust governance structures, transparent management, and effective oversight to ensure that actions are taken transparent, accountable, and ful outcomes taking into account local conditions, health care priorities, and resources (Eldridge, 2021).

In general, public-private partnerships (PPPs) in health care have the potential to remove barriers and increase access to essential health services, especially in remote and underserved areas. Although there may be challenges along the way, it is important for governments to embrace the opportunities offered by PPPs and develop long-term plans and sustainable policies. It is equally important that decision makers prioritize local needs and consider each community in its unique context. By doing so, PPPs can be a powerful tool to ensure accessibility and standardization of health services (WHO, 2018).

Measuring success in Public-Private Partnership Programs

Measuring the success of Public-Private Partnership (PPP) models is important to the ful identification of appropriate paths, the attainment of the target level, and the protection of the project against unnecessary risks. assessment frameworks supply ready-made methods for the appraisal of the progress and the quality of PPP initiatives by virtue of many attributes viz. governance, legal frameworks, institutional capacity and stakeholder engagement. These directions are paramount for uncovering the stressed out over quality and supply chain-speed in some cases industries such as health care.

Several international frameworks have been developed to assess the success of the PPP models. For instance, the ADB PPP Maturity Model considers six critical dimensions: policy and strategy, legal and regulatory frameworks, institutional capacity, project identification and preparation, project management, and contract management (ADB, 2017). The model offers a broad-based tool for benchmarking the performance of PPPs and identifies specific points where changes need to be made in order to achieve the intended results.

Moreover, the World Bank's PPP Project Success Model pays attention to the project development lifecycle. This model evaluates maturity in five stages of the project: project identification, preparation, tendering, contract management, and implementation. It points out the preparations at each stage, and so is helpful to both governments and private partners, who are then able to identify the space and the order of the actions to be taken for better project results (World Bank, 2017). Along with the emphasis on the performance of the projects, by the consideration of the model on the project-specific measures, the mode leads to concrete solutions for the technological aspects of PPPs.

Another important contribution is the development of a PPP Success Model by the European PPP Expertise Centre, EPEC, which assesses seven dimensions: enabling environment, project identification, project preparation, procurement, contract management, asset management, and stakeholder engagement (EPEC, 2019). The model underlines the need for stakeholder involvement and gives emphasis to strong institutional and legal support for sustaining the PPP projects over time.

One of the most prominent frameworks is the United Nations Economic Commission for Europe (UNECE) PPP Maturity Model that appraises six stages of the PPP lifecycle: project initiation, procurement, contract management, implementation, operation, and handing over. This concept is a bottom-to-top approach that looks at both the operational and strategic dimensions of partnerships towards a full picture. The UNECE model also highlights the need for advanced planning and capacity building to make sure that PPPs create public benefits that are sustainable (UNECE, 2017).

In addition to these institutional frameworks, IPMA developed a PPP Success Model, which was focused on project management practices. It evaluates project maturity against five levels of initiation, definition, implementation, control, and closure. This model is very useful in assessing

project management competencies that are expected to deliver complex PPP projects fully (IPMA, 2015).

These success models offer a number of benefits to both governments and private partners in the following ways: they offer systematic assessment of the performance of PPPs, indicating those areas where improvement is necessary; benchmarking against best practices provides stakeholders with the avenue to adopt strategies that have already worked elsewhere in similar contexts; and they promote continuous improvement, giving a structured approach toward the monitoring of progress and challenges.

The assessment of the maturity of PPPs within the health sector is quite critical, given its complexity and criticality for service. Such an assessment will be helpful in finding out the gaps in governance, mechanisms for funding, and stakeholder engagement that can affect the effectiveness of healthcare PPPs. For example, frameworks like the ADB and World Bank models provide a guide for governments to address weaknesses in project preparation and contract management that will ensure that the partnerships deliver quality healthcare services.

The success levels of the PPP models continue to be an active area of development in Ethiopia. The partnership between International Clinical Laboratories and public hospitals presents a very interesting case study for examining the success of PPP. While the collaboration has recorded milestones such as expanding diagnostic services and integrating advanced technologies, challenges persist in areas like governance frameworks, stakeholder coordination, and financial sustainability. In this case, a maturity assessment of the partnership would clearly outline several points on strengths and weaknesses for future improvements.

Defining the success levels of PPP models is an important step in securing the long-term success and sustainability of these models. Through structured frameworks, governments and their private partners will better identify gaps and realize needed improvements to further advance their partnership performance. In such high-stakes sectors as health, where stakeholder interests are paramount, the importance of success assessment can better help achieve improvements in service delivery and public health goals. The adoption of such frameworks in the still developing PPP ecosystem in Ethiopia will further contribute to more effective and resilient partnerships.

2.2 Empirical Review

Public-Private Partnerships (PPPs) have become a promising way to improve healthcare, fix problems in public health systems, and provide better services in developing countries (Mazibuko, 2023). These partnerships can work in different ways, like public health programs that involve private companies. This allows both sides to share risks, resources, and benefits (Naznin et al., 2022).

In developing countries, public-private partnerships (PPPs) have been used to address issues such as poor healthcare facilities, lack of skilled workers, weak systems, and limited options in remote and rural areas (Joudyian, 2021). Using PPPs in healthcare can help get better results for the money spent, bring in private funding, and encourage new ideas in different areas (Mialon, 2016).

However, using public-private partnerships (PPPs) in healthcare comes with its own set of challenges. Al-Mazrou et al. (2022) pointed out problems at the local level, including issues with healthcare policies, unfair distribution of resources, poor coordination between public and private sectors, slow approval processes, legal and regulatory hurdles, lack of openness and responsibility, and technology-related difficulties. Private healthcare is often more expensive because it focuses on making profits, which makes it unaffordable for many people (Al-Mazrou et al., 2022).

A study has also found that Public-Private Partnership (PPP) models can be helpful when current healthcare systems are not efficient or good enough. For these models to work well and support long-term economic growth and healthcare for everyone, there needs to be strong cooperation between the government and private companies (Chakravaty, 2015).

Several factors affect how well public-private partnerships (PPPs) work in healthcare. For example, a strong focus on improving quality, being accountable, and having good infrastructure can help these partnerships succeed. This is evident in Lesotho's Queen 'Mamohato Memorial Hospital Integrated Network, which is the country's biggest healthcare PPP (Chelsea et al., 2024). However, problems like managing staff effectively and weaknesses in the overall health system and referral networks can slow down progress (Chelsea et al., 2024). Research has also found specific challenges and supports in different regions and countries, such as Poland, China, Iran, and Saudi Arabia. These include issues like short-term agreements, lack of funding, political and financial risks, and the need for better technology (Kosycarz, 2019; Wang, 2019; Hojatolah, 2023; Mohammed, 2020).

In India, a number of empirical studies have been conducted to demonstrate the transformative power of PPPs in primary healthcare delivery. Thus, telemedicine and AI-driven diagnostic PPPs, for example, greatly extended the ability to provide healthcare to remote and underserved areas while also enhancing the chances to diagnose and manage diseases in the early stage (Chandramohan, 2024). Most of these collaborative deals have employed innovative technologies to transcend the obstacles of geography and infrastructure, thereby contributing to healthy living. Besides this, “Rashtriya Swasthya Bima Yojana” (RSBY) proven as a PPP project, which aimed to provide health insurance for the unprivileged, could make a very impressive difference in the direction of increasing healthcare coverage. But, weaknesses in oversight and poor enrollment rates, and inferior access among rural populations show the difficulty in putting such programs into practice at a large scale. Khetrapal (2019) says that a sustained victory is possible only by implementing strong regulatory frameworks, efficient monitoring, and fair access mechanisms.

The provision of healthcare by the private sector in Kenya can be utilized as a paradigm of how PPPs can enhance healthcare systems. Ondari and Muturi (2016) are examples of this. They looked at the effect of PPPs in the Kenyan state hospitals and they pointed out the fact that there was an increase in the operational efficiency, service quality, and patient satisfaction. These alliances allowed for the optimization of human capital and the upgrading of human trafficking countermeasures, thus causing the hospitals' performance to improve in services provisioning. However, the problems of prospects management, financial sustainability, and the development of skills remain as the obstacles in full realization of these initiatives. Kenyan experience plays a crucial role in highlighting the need to host the concerned stakeholders from both the end-users and the government to make the financial strategies that will be used over a long period.

Throughout Africa, Public-Private Partnerships (PPPs) have emerged as a necessary instrument in tackling health problems that include insufficiency in infrastructure, lack of resources, and fragmentation in the delivery of services. Data shows that through such partnerships, greater use is made to raise accessibility, improve productivity, and drive Innovations To help achieve this target of Healthcare systems.

In South Africa, PPPs have been very instrumental in strengthening hospital infrastructure and service delivery. For instance, the change made at the Inkosi Albert Luthuli Central Hospital

(IALCH) is the most noticeable one. The hospital acquired high-tech medical devices in a partnership with a private company. Over and above, the private sector, particularly, was very keen on the effectiveness, new employee training, and information (Naidoo et al., 2019). Nevertheless, these improvements will be accompanied by challenges in their operation, uptake, and forthcoming highly requested equity and reliability.

Kenya has taken on PPPs to increase the quality of healthcare services at the county level. A good example is the Managed Equipment Services (MES) project, a national PPP initiative, which was intended to equip public hospitals with modern medical technology. The plan showed the hospitals' improved diagnostic and treatment capabilities, particularly in underserved areas. A study by Waithaka et al. (2020) mentions great results from the improvements in patient satisfaction and service efficiency. Nevertheless, the venture was criticized for the high costs, unclearness of its status, and inadequate public participation, which emphasized the importance of robust tracking methods and inclusive planning procedures.

In Nigeria, public-private partnerships (PPPs) have played an important role in widening access to diagnosis and specialized services. With the collaboration between the Ministry of Health and privately-owned diagnostic centers, including Lagos State Public-Private Partnership Laboratory Network, we have recorded significant improvements in the accuracy of diagnoses and the laboratory testing turnaround times have been reduced. Empirical evidence supports the claim that these partnerships have improved the detection and management of communicable diseases such as malaria and tuberculosis (Okeke et al., 2020). However, challenges such as insufficient funding, lack of regulatory oversight, and unawareness of the public remained as obstacles to the PPPs.

Another example is Ghana, where the application of PPPs has helped in bridging the health financing and service delivery gap. NHIS implemented with private sector collaboration has increased coverage and reduced out-of-pocket spending by the patients. Indeed, the studies by Akazili et al. (2018) show an increase in the utilization of health services, especially for the poor. Despite these successes, the scheme has sustainability challenges that emanate from shortfalls in funding and inefficiency in claims management, therefore requiring improved financial management and accountability.

In Uganda, PPPs have performed their duty to be more strengthened within maternal and child health services. Collaboration that took place between the Ministry of Health and healthcare institutions of private nature led to better medical care such as antenatal care and safe delivery services as well as immunization programs in the countryside. The actual results of the investigations of the Nabukeera et al. (2021) studies suggest that in this way maternal and child survival rates have drastically been reduced. There are, however, issues such as scarcity of resources, underdeveloped referral systems, and unskilled health workers which are still looming challenges to the organization.

Generally, the African practice of PPPs reveals clearly their potentials and challenges. It is not denied that the presence of the cooperation has contributed to the progress of the infrastructure, diagnosis, and the health care services, though their ultimate outcomes are mainly determined by the power of a state's financial management & organization, operative resolutions, and investors' concord. Lessons learned from countries like South Africa, Kenya, and Nigeria, stress that among the most significant the coming up of the fair and clear contracts, the engaging decision-making process, and the on-going evaluation of the strategies are the ones most important in ensuring the delivery of helpful and lasting healthcare.

In Ethiopia, Public-Private Partnerships (PPPs) are presented as a major approach to resolve health care problems, such as lack of infrastructure, shortage of resources and very little access to quality services. The evidence from the field points out both the accomplishments and persisting problems in the partnerships, mainly in increasing diagnostic services, the effort to better the prevention programs for disease, and the overall improvement of health care.

One example of PPP that was smoothly delivered in Ethiopia is the connection of the International Clinical Laboratories (ICL) with the public hospitals. This liaison has brought about a dramatic increase in the availability of diagnostic services throughout the entire country. The documented studies of Fekadu et al. (2023) confirm that in addition to the transfer of new technologies, the link brought about a reduction in the waiting time for the patients and at the same time, a more accurate diagnosis was made, particularly in those regions that are underserved. Nonetheless, the project has been challenged by such issues as the price differences of intermediate products and services and public services, budgetary limitations in the public sector, and regulatory oversight

impediments. These results underline that there is a great necessity for the implementation of a better policy system and financial instruments to provide justice and ensure continuity.

During the COVID-19 pandemic private-public partnerships became a downright necessity for the expansion of the molecular diagnostic capacity in Ethiopia. Private laboratories collaborated with the Ministry of Health to establish molecular testing facilities, leveraging their technical expertise and infrastructure. Mistre et al. (2022) mentioned the super-fast installation of diagnosis services, which helped in the detection and control of the disease at an urgent time. Of course, hardships such as the exaggerated costs of molecular tests and the lack of consistent supply chains and incoherent policies remained challenges that significantly curtailed these collaborations' full potential. Remedying these concerns is tantamount to ensuring future public health emergencies are handled with the necessary preparedness.

Besides diagnostic services, PPPs have also been adopted to strengthen laboratory systems in Ethiopia, including the integrated specimen referral system. The partnership linked health centers at grassroots levels to central laboratories to facilitate timely diagnosis and treatment of diseases such as tuberculosis and HIV/AIDS. According to Yenew (2016), the initiative has enhanced efficiency at laboratories and increased access to essential diagnostic services at rural levels. Notwithstanding the above successes, resource limitation and lack of confidence among both public and private stakeholders remain challenges for broader rollouts.

Public-private partnerships have also contributed to the fight against infectious diseases, and to safer maternal and child health. One way they have managed to do that is the ties created with private pharmaceutical firms and NGOs that have expanded the supplies of vaccines and essential medications for diseases such as measles and malaria in the country. The descriptive studies by Berhanu et al. (2020) are reflective of how these coalitions have had an immense impact on the increase in vaccine coverage and the decrease in the number of cases in specific areas. Equally, the PPS in maternal health support programs have played a part in furthering the access of antenatal and safe delivery services thereby dropping the maternal death figures in some areas. However, inadequate referral systems, lack of finances, and a minimal number of qualified medical personnel are still among the obstacles.

The Ethiopian government has also explored PPPs in healthcare infrastructure development. Partnerships with private investors have facilitated the construction and management of hospitals and health centers in urban areas, addressing gaps in capacity and service quality. While these initiatives have increased access to care, particularly in cities, they have often been criticized for focusing on higher-income populations, leaving rural and underserved areas with limited benefits.

Ethiopia's PPP experience effectively manages the critical healthcare issues and delivers better healthcare. The deployment of public–private partnerships (PPPs) in such moves as ICL partnership, specimen referral system, and COVID-19 diagnostics has demonstrated the transformation that would rather be impossible in the absence of PPPs. In spite of this, of course, success of these schemes has been quite a problem as the three above-mentioned key areas of governance, financial sustainability, and equity have been the greatest challenges that require relevant policies and their effective institutionalization. Via overcoming these barriers, Ethiopia can optimize PPPs to bring about more equal and greener health results.

2.3 Conceptual Framework

Leveraging the extensive literature review made in this chapter, this study developed a conceptual framework, depicted in the below figure, which serves as a guiding construct. In this particular study, the conceptual framework was developed based on deep understanding of the main factors that generate the success and continuity of Public-Private Partnerships (PPP) in the health sector. It links the theoretical perspectives with the empirical material and combines findings from the literature review with the objectives of the study.

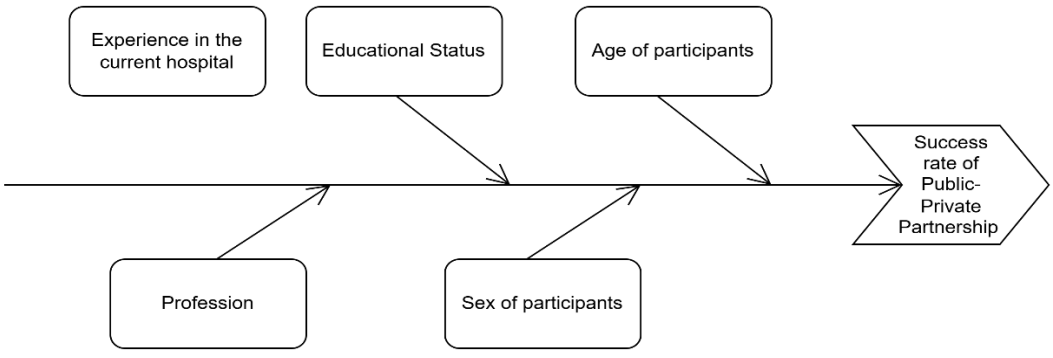

Figure 1: Conceptual Framework, Sociodemographic factors that influence the success rate of PPP between the International Clinical Laboratories and Public Hospitals

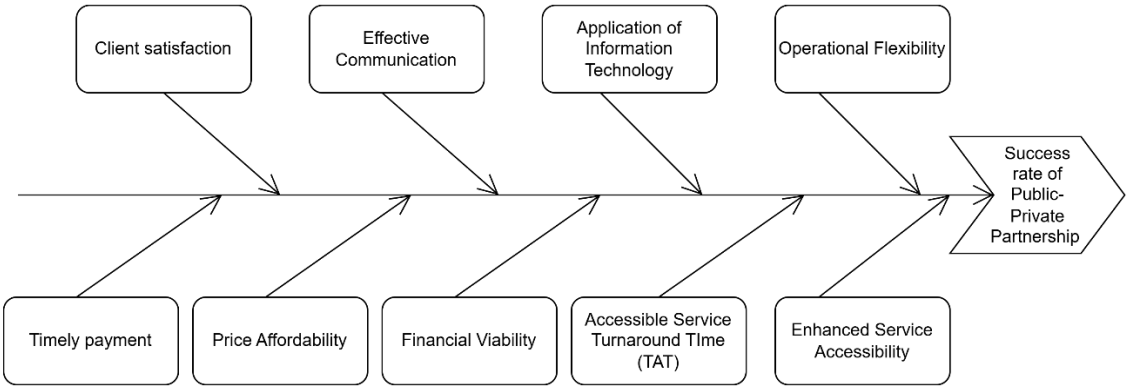

Figure 2: Conceptual Framework, Other factors that influence the success rate of PPP between the International Clinical Laboratories and Public Hospitals

Chapter Three

Research Methodology

3.1 Description of the Study

The study was conducted on ten Public Hospitals that are partners with the International Clinical Laboratories (ICL) through a public-private partnership program arrangement. International Clinical Laboratories, established in 2004, is headquartered in Addis Ababa, and it maintains seven patient care centers in that vicinity. The laboratory has 11 branches across various regions of Ethiopia. Whereas, the selected public hospitals are found in five regions of Ethiopia, namely Oromia, Amhara, Sidama, Central, and South Ethiopia. These hospitals are classified as general and referral hospitals, providing a wide range of general and specialized clinical services. Through the partnership program, the hospitals are referring samples to International Clinical laboratories for advanced diagnostic tests which are not accessible in their hospital.

3.2 Research Design

A quantitative cross-sectional study design was employed to determine the success rate of the PPP program and identify factors influencing the program success among clinicians and hospital managers working in Public Hospitals. The service provider in this study specifically refers to the International Clinical Laboratories (ICL) and the users are, the Public Hospitals who are in partnership with the International Clinical Laboratories. A Quantitative survey is mainly focuses on measuring the problem under study numerically. This instrument is used to measure users' perception and experiences towards the Public-Private Partnership program on diagnostic services. This study was done from the users' perspective only.

3.3 Population and Sampling

3.3.1 Target Population

The targeted population of this study were all physicians practicing within the hospitals which have been participating in the PPP program, as well as coordinators and managers of the public hospitals.

3.3.2 Study population

The study population was consisting of physicians and health facility coordinators and managers who were actively employed in the selected hospitals that operate under the public-private partnership (PPP) program. Additionally, the population was included service coordinators/managers who were responsible for coordinating this services in the hospitals.

3.3.3 Eligibility criteria

Physicians, manages and service coordinators who are engaging to PPP program at least for six months were included to this study. However, physicians and service coordinators who were not active on their duty due to different personal reasons in the past one year, severely sick and unable to provide response were excluded.

3.3.4 Sample size and sampling technique

3.3.4.1 Sample size calculation

To calculate the sample size, we conservatively assumed that 50% of previously implemented PPP programs have reached success. Additionally, we considered a 95% confidence level and a 5% estimation precision. Based on this assumption, the sample size was determined using the population-adjusted single population proportion formula.

$$n = \frac{NZ^2_{1-\frac{\alpha}{2}}p(1-p)}{d^2(N-1) + Z^2_{1-\frac{\alpha}{2}}[p(1-p)]}$$

Where, N- total target population of physicians and coordinators; $Z_{1-\alpha/2}$ -critical value under standard normal distribution curve for confidence level ($Z_{1-\alpha/2}$ = 1.96 for 95% confidence level); p-true population proportion of program success; and d-estimation precision. After substituting the appropriate values into the formula, the initial total sample size is determined to be 154. However, to account for potential non-response and registration errors due to the online data collection method, an additional 20% contingency sample is considered. This brings the total sample size to 185 participants.

Sampling techniques

To select the public hospitals in the study, a simple random sampling method was employed, resulting in a sample of 10 hospitals. From these selected hospitals, individual physicians were enrolled using a simple random sampling technique. This approach ensures that each hospital and physician within the selected hospitals had an equal chance of being included in the study, minimizing bias and providing a representative sample for analysis.

3.4 Data Source and Collection Methods

To collect the data, a structured questionnaire was developed based on a relevant literature. The literature guided the design of the questionnaire so as to ensure it consists of key variables relevant to our study objective. The survey was self-administered, and the data was collected using online google form.

To reduce potential biases that may arise from interviewer influence, the participants were completed the questionnaire independently. For the purpose of convenience and to enhance accessibility, the data was collected through an online platform, the google forms. Then the data were carefully checked for errors, inconsistencies, and completeness, to ensure data integrity, quality, and accuracy.

Information on PPP Program success was collected by 16 question items (in 4 dimensions). Whereas, to assess factors associated with PPP Program success a total of 10 question items were used. The response on each question was recorded by “Yes” or “No”. Then, categorical principal component analysis was applied to create a composite index from PPP program success indicators.

3.5 Study Variables

Dependent variables

- Success rate of Public-Private Partnership program

Independent variables

- Age
- Sex
- Educational status
- Profession
- Work experience in the current organization
- Enhanced service accessibility
- Acceptable Turnaround Time for services
- Operational flexibility
- Price affordability
- Timely payment
- Financial viability
- Effective communication
- Application of Information Technology
- Client satisfaction

3.6 Instrument Reliability and Validity

The collected data was analyzed to assess its internal consistency using Cronbach's Alpha, following Hair's (2014) recommendation that a value of .70 or higher indicates an acceptable level of consistency. To evaluate the reliability of the measurements, Cronbach's Alpha values was calculated utilizing IBM SPSS Version 22.0 for the items within each construct. All constrict items were scored Cronbach's Alpha greater than or equal to 0.70, which shows good reliability.

Table 1: Cronbach's Alpha Test

Variable	Number of items	Cronbach's Alpha Value
Meeting design goals	4	0.75
Benefits to end user	4	0.73
Benefits to public partner	4	0.74
Preparing for the future	4	0.77

Furthermore, to minimize selection bias, random sampling was employed, and participants' characteristics were assessed during descriptive data analysis. Information bias was minimized by validating data collection tools and providing uniform orientation for coordinators in each hospital. Trustworthiness was assured through clear presentation and detailed descriptions.

3.7 Data Analysis

The sociodemographic characteristics of the respondents was analyzed using descriptive statistics such as frequency, percentage, mean with standard deviation (for normally distributed continuous variables), and median with interquartile range (for non-normally distributed continuous variables). These statistics provided a summary of the respondents' characteristics.

We categorized PPP program success using mean and Standard deviation. For the responses which were scored below mean-SD, was considered as unsuccessful and those scored above the mean+SD taken as successful.

To determine the factors influencing the PPP Program success, a logistic regression model was applied. During the bivariate analysis, variables with a p-value of ≤ 0.05 was considered for inclusion in the multivariate model using a stepwise model building method. The fitness of the model was assessed using log likelihood ratio statistics.

Odds ratios (OR) with their corresponding 95% confidence intervals (CI) was reported to demonstrate the estimation precision and the level of association between the independent variables and PPP program success.

The quantitative data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 22.0. The level of significance will be set at 0.05, indicating that p-values below this threshold was considered statistically significant.

3.8 Ethical Considerations

A formal request was made to ICL from the College of Business and Economics, Addis Ababa University, for permission to conduct the study within their organization's context and partnered hospitals. Following our request, the International Clinical laboratories wrote a support letter for each hospital emphasizes the importance of the study to further enhance the PPP program. Moreover, before distributing the questionnaire, we provided comprehensive information to the participants about the study's objectives, and their consent was obtained in accordance with ethical guidelines. During the data collection process, we ensured objectivity and keeping the principles of privacy and confidentiality.

Any personal information that could potentially reveal the participants' identity was not collected in this study. This was part of the orientation before questionnaire administration. We also maintained the security and confidentiality of the collected data.

Electronic data stored securely with limited access through password protection. Only authorized individuals involved in the research had access to the electronic data.

Chapter Four

4.1 Data Presentation, Analysis, and Interpretation

This study aims to analyze the public-private partnership program success between the International Clinical Laboratories and public hospitals on the diagnostic services in Ethiopia. This chapter presents the analysis and interpretation of the data collected to address the research questions and objectives in this study. The collected data were analyzed and interpreted using descriptive and inferential statics.

Sociodemographic characteristics of the participants

Table 2: Sociodemographic characteristics of the participants, self-administered interview, healthcare workers and coordinators who are working in Hospitals covered under the PPP Program, 2024

Variable		Frequency	%
Sex	Male	158	81.9
	Female	35	18.1
Age (in year)	<30	109	56.5
	30–35	62	32.1
	>35	22	11.4
Experience (in year)	1–2	73	37.8
	3–5	65	33.7
	6–10	45	23.3
	>10	10	5.2
Education status	Specialist/Phd	20	10.4
	MSc/MBA	33	17.2
	MD/GP	90	46.9
	BSc/BA	45	23.4
	Diploma	4	2.1
Profession	Clinician	112	58.6
	Laboratory	11	5.8
	Non-healthcare professionals	68	35.6

The calculated sample size was 185 participants. However, we included a total of 193 individuals to increase the estimation power. Table 1 depicts sociodemographic distribution of the study participants. Majority (81.4%) of the participants were male, and 112 (58.6%) were clinician. The mean age of the participants was 31 (±SD = 5.0) year with age range of 23–56 year. The median work experience in the current organization was 3.0 (interquartile range (IQR) = 2.0 – 6.0) year. Majority (46.9%) of the participants were general practitioners, and 109 (56.5%) were in the age range of younger than 30 year.

Table 3: Frequency distribution of factors influencing public private partnership program success (n = 193 if not indicated), self-administered interview, healthcare workers and coordinators who are working in Hospitals covered under the PPP Program, 2024

Variable		**Frequency**	**%**
Enhanced service accessibility (n = 190)	Yes	39	20.5
	No	151	79.5
Acceptable TAT (n = 192)	Yes	81	42.2
	No	111	57.8
Operational flexibility (n = 191)	Yes	59	30.9
	No	132	68.4
Price affordability (n = 192)	Yes	67	34.9
	No	125	65.1
Timely payment	Yes	112	58.0
	No	81	42.0
Financial viability	Yes	53	27.5
	No	139	72.0
Effective communication (n = 192)	Yes	51	26.6
	No	141	73.4
Application of information technology	Yes	47	24.4
	No	145	75.1
Client satisfaction (n = 192)	Yes	43	22.3
	No	149	77.2

TAT-Turnaround time

Approximately four-fifth of the participants were disagreed with enhancement of advanced diagnostic service accessibility at the periphery level, and 111 (57.8%) disagree with the expected TAT for results delivery [Table 2]. About 70% of the participants claimed that the operation of the service was not flexible, and 125 (65.1) reported the price of the service was not affordable [Table 2]. Of the 193 participants, 112 (58.0%) were indicated the time of payment is acceptable, and 139 (72.0%) participants were indicated the PPP program was not financially viable [Table 2]. The majority (73.4%) of the participants were claimed there was no effective communication system, while 145 (75.1%) indicated there was no information technology application, and 149 (77.2%) participants were not satisfied with advanced diagnostic services under PPP program [Table 2]. This contributes to the overall inefficiency of the program and suggests the need for a comprehensive evaluation and improvement of the existing communication processes and technological integration within the PPP program.

Public private partnership program success rate and sociodemographic distribution

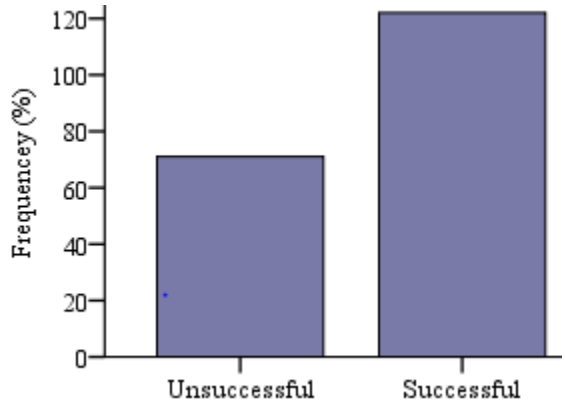

Figure 3: Public private partnership program success rate, self-administered interview, healthcare workers and coordinators who are working in Hospitals covered under the PPP Program, 2024

The overall proportion of public private partnership program success was 63.2% (95% Confidence interval (CI): 56.2–69.7) [Fig 2]. This indicates a moderate level of effectiveness of the program in achieving its goals. Also, while the program is making progress, still there is a considerable room for improvement.

Table 4: Distribution of sociodemographic factors by public private partnership program success, a bi-variate logistic regression analysis, self-administered interview, healthcare workers and coordinators who are working in Hospitals covered under the PPP Program, 2024

Variable		Program successful, n (%)	Program unsuccessful, n (%)	p-value
Sex	Male	94 (59.5)	64 (40.5)	0.023
	Female	28(80.0)	7(20.0)	
Age (in year)	≤30	75(68.8)	34 (31.2)	0.091
	31- 35	37 (59.7)	25 (40.3)	
	≥35	10 (45.5)	12 (54.5)	
Experiences (in year)	≤ 2	55 (75.3)	18 (24.7)	0.003
	3–5	43(66.2)	22 (33.8)	
	6 – 10	19 (42.2)	26 (57.8)	
	≥ 10	5 (50.0)	5 (50.0)	
Education status	Specialist/PhD	14 (70.0)	6 (30.0)	0.438
	MSc/MBA	19 (57.6)	14 (42.4)	
	MD	61 (67.8)	29 (32.2)	
	BSc/BA	24 (53.3)	21 (46.7)	
	Diploma	3 (75.0)	1(25.0)	
Profession	Clinician	77 (68.8)	35 (31.3)	0.054
	Laboratory	4 (36.4)	7 (63.6)	
	Other	39 (57.4)	29 (42.6)	

Table 3 shows the distribution of sociodemographic factors by PPP program success rate. Of the total participants, 94(59.5%) of male participants were claimed the program was successful, while only 28 (80.0%) females indicated program successful. Majority (68.8%) of the participants who were younger than 30 year indicated the program was successful, while 37 (59.7%) of participants in the age category of 31-35 reported as the program was successful. Moreover, 61 (67.8%) of the MDs and 77 (68.8%) of the clinicians claimed that the program was successful. This indicates a notable perception of success towards the program, particularly among younger participants. Also, the higher success response among MDs further support the program's sustainability within the

medical community. However, targeted efforts may be required to engage and assess the perspective of older participants to ensure a more inclusive understanding of the program's impact.

Distribution of public private partnership program success by different indicators

Table 5: Distribution of Public Private Partnership Program success by different success indicators, a bi-variate logistic regression analysis, self-administered interview, healthcare workers and coordinators who are working in Hospitals covered under the PPP Program, 2024

Variable		Program Successful, n (%)	Program unsuccessful, n (%)	p- value
Service accessibility (n = 190)	Yes	35(89.7)	4 (10.3)	< 0.001
	No	86 (57.0)	65 (43.0)	
Acceptable TAT (n = 192)	Yes	62 (76.5)	19 (23.5)	0.001
	No	60 (54.1)	51(45.9)	
Operational flexibility (n = 191)	Yes	50 (84.7)	9 (15.3)	<0. 001
	No	72 (63.9)	60 (36.1)	
Price affordability (n = 192)	Yes	53 (79.1)	14 (20.9)	0.001
	No	69 (55.2)	56 (44.8)	
Timely payment	Yes	78 (69.6)	34 (30.4)	0.029
	No	44 (54.3)	37 (45.7)	
Financial viability	Yes	40 (75.5)	13 (24.5)	0.027
	No	81 (58.3)	58 (41.7)	
Effective communication (n = 192)	Yes	41 (80.4)	10 (19.6)	0.003
	No	80 (56.7)	61 (43.3)	
Application of information technology	Yes	41 (87.2)	6 (12.8)	< 0.001
	No	80 (55.2)	65 (44.8)	
Client satisfaction (n = 192)	Yes	35 (81.4)	8 (18.6)	0.006
	No	87 (58.4)	62 (41.6)	

Majority (89.7%) of the participants who claimed the service was accessible were reported the program was successful, while 4 (10.3%) indicated the program unsuccessful. In addition, among the participants who claimed absence of service accessibility 86 (57.0%) were reported the program was successful, and 65 (43.0%) indicated the program unsuccessful. Of the participants, reported the TAT is acceptable, 62 (76.5%) were claimed the program was successful, while 19 (23.5%) indicated unsuccessful. Moreover, among the participates who claimed the TAT is not acceptable. 60 (54.1%) were indicated the program was successful, and 51 (45.9%) indicated unsuccessful.

With regard to operational flexibility, among the participants who reported having flexibility, 50 (84.7%) indicated that the program was successful, while 9 (15.3%) were unsuccessful. In comparison, among those who indicated a lack of operational flexibility, the success rate was 72 (63.9%)

Similarly, participants who reported the PPP program was affordable also indicated that a higher program success rate, with 53 (79.1%) participants reported successful, and 14 (20.9%) did not. However, the success rate of the PPP program for those who thought the program was too expensive was lower, at 69 (55.2%), while 56 (44.8%) did not succeed.

One significant aspect affecting the program outcomes was timely payment for the services provided by the International Clinical laboratory. Of those who reported that there were timely payments, 78 people (69.6%) indicated that the program was successful, whereas 34 people (30.4%) were not. On the other hand, among those who reported as there was no timely payment 44 (54.3%) people reported the program was successful, while 37 people (45.7%) responded unsuccessful.

With regard to financial viability, those who thought the program was viable reported a high rate, with 40 participants (75.5%) succeeding compared to 13 (24.5%) who did not; among those who thought the program was financially unviable, success rates decreased to 81 (58.3%), with 58 (41.7%) failing, yielding a statistically significant p-value of 0.027.

Similar to this, effective communication was important; 41 participants (80.4%) who reported effective communication had success, compared to just 10 (19.6%) who did not; those who did not report effective communication had a success rate of 80 (56.7%) versus 61 (43.3%) failures, with a p-value of 0.003, highlighting the significance of effective communication.

The study also analyzed the application of Information Technology in relation to the program success. Application of information technology was considerably more significant, with 41

(87.2%) of those who used it reporting success and only 6 (12.8%) not. A highly significant p-value of less than 0.001 was obtained for individuals who did not use technology, since only 80 (55.2%) succeeded and 65 (44.8%) failed.

Lastly, we analyzed the users' satisfaction from the program success perspective. The success rate for clients who expressed satisfaction was 35 (81.4%), while the success rate for those who did not was 8 (18.6%). The success rate for dissatisfied clients was lower, at 87 (58.4%), with 62 (41.6%) failing, with a p-value of 0.006 indicating a significant relationship (Table 4). The difference outcomes between the satisfied and dissatisfied clients further emphasizes the importance of addressing these components to enhance the overall PPP program effectiveness.

Factors associated with PPP program

Table 6: Factors associated with Public Private Partnership program, a multi-variate logistic regression analysis, self-administered interview, healthcare workers and coordinators who are working in Hospitals covered under the PPP Program, 2024

Variable		UOR (95% CI)	P-value	AOR (95% CI)	P- value
Sex	Male	1.0		1.0	
	Female	2.7(1.1–6.6)	0.027	2.9 (1.1–7.8)	0.039*
Age	≥35	1.0		1.0	
	30-35	2.7(1.1 – 6.7)	0.041	2.2 (0.71 – 6.7)	0.175
	≤30	1.8(0.7–4.7)	0.251	2.2 (0.69 – 7.0)	0.186
Experience in the current organization	1 – 2	1.0		1.0	
	3 – 5	3.1(0.8–11.8)	0.105	4.4 (0.67–29.0)	0.123
	6 – 10	1.9(0.5–7.5)	0.328	4.7 (0.73–29.5)	0.105
	>10	0.73(0.2–2.9)	0.65	1.7 (0.28–10.4)	0.556
Profession	Clinician	1.0		1.0	
	Laboratory	1.6(0.9–3.1)	0.123	0.97 (0.17–5.6)	0.972
	Others	0.4(0.1–1.6)	0.203	1.4(0.61–3.4)	0.400
Service accessibility	No	1.0		1.0	
	Yes	6.6(2.2–19.5)	0.001	3.6(0.98–13.5)	0.045*
TAT	No	1.0		1.0	
	Yes	2.8(1.5 - 5.2)	0.002	1.7 (0.75– 3.9)	0.204
Flexibility	No	1.0		1.0	

	Yes	4.6(2.1 – 10.2)	<0.001	2.7 (1.1–6.8)	0.035*
Affordability	No	1.0		1.0	
	Yes	3.1(1.5 – 6.1)	0.001	1.3(0.58 – 3.1)	0.491
Timely Payment	No	1.0		1.0	
	Yes	1.9(1.1 – 3.5)	0.030	1.1 (0.54 –2.5)	0.724
Financial viability	No	1.0		1.0	
	Yes	2.2(1.1 – 4.5)	0.029	1.3(0.59 – 3.1)	0.486
Communication	No	1.0		1.0	
	Yes	3.1(1.5 – 6.7)	0.004	2.3 (0.90 – 5.7)	0.083
Application of information technology	No	1.0		1.0	
	Yes	5.6(2.2–13.9)	0.000	4.5 (1.5–14.0)	0.009*
Satisfaction	No	1.0		1.0	
	Yes	3.1(1.4–7.2)	0.008	1.1 (0.33–3.6)	0.883

Age, education status, experience in the current organization, and profession were not significantly associated with PPP program success in in unadjusted analysis [Table 5]. However, all of the variables considered in the current study were significantly associated with PPP program success in unadjusted analysis [Table 5]. The model contains 13 variables with dummy variables: $(log\frac{p}{1-p} = \beta_0 + \beta_1 Sex + \beta_2 Age_1 + \beta_3 Age_2 + \beta_4 Exp_1 + \beta_5 Exp_2 + \beta_6 Exp_3 + \beta_7 Prof_1 + \beta_8 Prof_2 + \beta_9 Access + \beta_{10} TAT + \beta_{11} Flex + \beta_{12} Afford + \beta_{13} Time\ pay + \beta_{14} Finc.Viabile + \beta_{15} Communic + \beta_{16} Info.tech + \beta_{17} Satisfaction$ with -2log likelihood statistics = 189.225 and significantly fit the data with $p < 0.001$. In this multivariable logistic regression model, female sex (Adjusted odds ratio (AOR) = 2.9, 95% confidence interval (CI) (1.1–7.8), p = 0.039), service accessibility (AOR = 3.6, 95% CI (0.98–13.5), p = 0.045), presence of program flexibility (AOR = 2.7, 95% CI (1.1–6.8), p = 0.035), and application of information technology in service delivery (AOR = 4.5, 95% CI (1.5–14.0), p = 0.009) were significantly associated with PPP program success [Table 5]. However, all other variables in the model above were not significantly associated with PPP program success [Table 5]. This finding suggests that having accessible and flexible services can result in a high chance of a successful and sustainable PPP program. Furthermore, the results show the critical role that information technology integration plays in achieving successful outcomes for such programs.

4.2 Discussion

This study aimed to determine the success of the PPP program and its associated factors. The overall success rate of the PPP program in the current study was 63.2%. This finding is similar to those of various studies reviewed by Basabih et al (2022), which have shown the success of PPP initiatives in service indicators at hospital level. Additionally, the study conducted by Maria and David (2016) determined that PPP hospitals were more successful than those managed solely by public institutions in terms of performance and efficiency. In contrast, according to Micaela et al (2019), the overall performance of the PPP model was low (42.3%) when specific measured indicators were considered. This discrepancy may be attributed to differences in study design, the types of services analyzed, and the metrics applied. Female sex, enhanced service accessibility, presence of program flexibility, and application of Information technology in the service delivery were significantly and positively associated with program success.

The odds of PPP program success was 2.9 (AOR) times higher in female participants compared to male. This indicates that female sex has some positive contribution for PPP program success. Although we were not able to find a comparative study that specifically analyzes sex as a potential factor that influence PPP success, there are theoretical insights (Michele, 2014 and Agnieszka, 2024) that explains this phenomenon. Women often take roles that are more collaboration, communication, and relationship building, which are very important aspects in successful partnerships including PPP programs. Such partnerships mainly depend on effective stakeholders' coordination, communication, and shared values. The collaborative nature associated with women's role may facilitate smooth interactions among partners, that contributes to the overall success of the programs.

Moreover, this result may provide understanding on a gender related influence on the perception of program success. Women and men may approach the assessment of PPP program success differently, with women prioritizing collaborative results over traditional success measurements. This perspective difference could lead to a more desirable evaluation of the program's success among female participants which ultimately influence the overall PPP program success rate.

In terms of service accessibility, the finding of this study shows that those participants who responded enhanced service accessibility were significantly more likely to perceive the PPP

program as successful, with an AOR of 3.6 (p = 0.045). This tells that improved access to service is an important factor in creating positive perceptions towards PPP program success. This finding is consistent with the report by Bastani et al. (2019), who conducted a comparative study analyzing hospital performance three years before and three years after the implementation of Public-Private Partnerships (PPP). Their finding shows that PPP program significantly increased access for diverse patient population for different types of diagnostic services. This aligns with the fact that enhancing service accessibility is one of the major objectives of PPPs in healthcare service delivery initiatives.

However, according to Nuno (2023), there are arguments that PPPs may limit access for lower income patients due to service affordability. The inherent risk associated with private partners often leads to the inclusion of premiums in their pricing, that can create barriers for economically disadvantaged communities. This indicates an important fact while addressing PPPs benefit; while it may enhance access for some demographics; they may as the same time restrict access to economically vulnerable groups.

The discrepancies between the two findings could be due to differences in study design. Bastani et a. applied a comparative study that focused on quantitative data of hospitals performance, allowing rigorous analysis of patient access before and after PPP implementation. In contrast, Nuno's study was relied on theoretical desk reviews only, which may not capture the real-world setting situations and experiences.

This finding also presented the relationship between operational flexibility and PPP program success. The Odds of reporting PPP Program success were 2.7 times higher (95% CI: 1.1 – 6.8, p=0.035) for participants who perceived operational flexibility as a factor for the PPP program success. This suggests that adaptable services models are better equipped to meet the evolving needs of users. From the theoretical point of view, in the context of PPPs, operational flexibility is critical for both parties that allows them to adjust their way of doing according to changing situations that includes change in patient demand, volume, or any shifts in healthcare system.

This finding aligns with the study done by Carlos and Rui (2013), which described that flexibility within PPP programs can enhance value for money by enabling adjustments to be made to tackle uncertainties behind long-term contracts. When partners are able to modify their routine operations

according to patients needs, they are more likely to achieve desirable results, including effective service delivery.

In contrast, as per Kosycarz et al (2019), long-term contracts within PPP frameworks often lack the necessary flexibility and enforce high penalties for changes. This rigidity can lead to an inflexible operational farmwork, which resulting in misaligned goals among partners and inadequate resources distribution. Such challenges may affect the capacity of the PPP to adapt to the real-time needs of healthcare system, which eventually affects the success of the program. The difference between the two studies could be due to the specific perspectives they applied in assessing PPP projects. While Carlos and Rui focused on the benefits of flexibility in improving operational effectiveness and patient outcomes, Kosycarz et al. emphasizes the structural limitations enforced by rigid contractual requirements. This difference highlights the importance of context when we stand to evaluate the impact of operational flexibility on PPP success.

In the present study, the odds of success for PPP were found to be 4.5 times higher (95% CI: 1.5 – 14.0, p=0.009) among participants who perceived that applying Information Technology positively contributed to the PPP Program success. This finding tells the important role of IT systems in enhancing operational efficiency and service facilitation within the PPP framework.

In support of this finding, a study conducted by Krishnan et al. (2021) highlighted the success of PPP projects that implemented digital health solutions, including telemedicine and technology assisted remote healthcare. In their analysis, a total of 7,408,283 laboratory tests were also included. This shows how integration of IT can facilitate more access to healthcare services and improve patient outcomes. This indicates that IT not only facilitates processes but also enhance the overall effectiveness and operational efficiency of healthcare delivery systems which contributes to PPP initiatives success as well.

However, in contrast to this finding, a study by Jafar et al. (2020), described significant challenges while implementing IT systems in PPP programs. Issues such as inadequate training, resistance to change among staff where PPP program takes place, and inherent complexity of Information Technologies can lead to delays and increased costs. These constraints may affect the success of the partnership not to achive the intended goals and hinders the expected benefits of IT applications. Jafar et al.’s study stressed that the effectiveness of IT in improving PPP success is dependent upon managing these challenges ahead.

The difference between these two studies may be due to the conditionality on theie analysis. While Krishnan et al. focus on the successful outcomes associated with the application of digital health technologies, Jafar et al. directly gets into the factors that can affect the effectiveness of IT applications within PPPs. This difference is important, as it indicates the complex nature of IT's role in partnership programs.

Both studies emphasize the use of IT in PPP programs can significantly contribute to PPP program success, particularly through improvements in communication and service delivery. However, to further maximize the benefits from IT applications, stakeholders should remain aware of the potential challenges. This awareness is very important for creating an environment conducive to successful IT application, which includes investing in adequate training, managing changes effectively, and simplifying complex technological systems.

Chapter Five

Conclusion, Recommendations, and Contributions of the study

5.1 Conclusion

Based on the findings of this study, implementing PPP programs in the diagnostic business is one of the areas that can attract both the public and private sectors to ensure better access to healthcare services. As gender dynamics have emerged as one of the key factors, their integration into the design and implementation of PPP programs is necessary. Additionally, improving service accessibility plays a critical role in addressing the healthcare needs of populations with limited access to diagnostic services. Furthermore, to strengthen PPP programs in the diagnostic service sector, enhancing IT capacity is crucial for optimizing the healthcare delivery process.

In general, to enhance the effectiveness of PPPs in healthcare, stakeholders should prioritize gender inclusivity, improve access to services, ensure operational flexibility, and integrate IT solutions. These strategies are important for maximizing the potential of PPPs to ultimately improve healthcare delivery in underserved communities.

5.2 Recommendations

The leadership in both sectors shall consider different factors while designing and implementing PPP in healthcare. This includes promoting gender inclusivity and encouraging female participation in PPP management roles to leverage their collaborative qualities and ultimately enhance the program's effectiveness. It is also critical to focus on increasing service accessibility for underserved populations while implementing PPP programs. Furthermore, the operational modalities of the PPP program should be designed flexibly to allow for adjustments based on feedback from clients and other stakeholders.

While implementing such projects or programs, it is important to support operations with appropriate information technologies and to integrate processes that can significantly enhance overall efficiency. Lastly, establishing a mechanism for regular joint monitoring and evaluation of the PPP program is very important for possible continuous improvements.

By implementing these strategies, International Clinical Laboratories (ICL) and the partner public hospitals can significantly enhance the effectiveness and sustainability of access to advanced diagnostic services through the PPP framework.

5.3 Limitations of the Study

It is important to recognize the limitations of this study in order to understand the conclusions and its implications accordingly. We observed two major limitations. Firstly, it lacks qualitative data to support the quantitative findings. Understanding that the study involves behavioral aspects and hidden factors that may still affect the PPP program success, a mixed-methods approach could have brought a more complete insight. Secondly, the study was single perspective assessment. We studied from the user's perspective only. While this focus can enhance the validity of the results by providing insights from both parties and other key stakeholders, it may also introduce biases. In our case, although users' perceptions are invaluable, yet they represent only one aspect of the broader PPP landscape. This approach would enhance the validity and applicability of the findings, ultimately contributing to more effective strategies for improving diagnostic services delivery through PPP.

5. 4 Areas for Further Research

The following areas shall further be investigated in the future to bring substantial information for possible review or revision of the country's PPP frameworks for more effective healthcare services delivery:

- **Gender dynamics in PPP success:** It is good to further investigate how gender roles and collaborative dynamics impact the success of PPPs in healthcare.
- **Demographic Interactions with PPP models:** It is important to explore how different demographic factors influence the outcome of PPP programs, by focusing on equitable distribution of benefits among different socio-economic groups. Future research shall aim to identify disparities in access to services and inform inclusive policy frameworks.
- **Resource sustainability and Workforce Incentives:** Since the PPP program models demand continuous resource availability, it is critical to study resource mobilization strategies to consistently respond to the needs of the program. Also, it is important to

further examine the workforce incentive models for effective service delivery through PPP arrangements.

- **Socio-economic impact of accessing service through PPP on Patients or end-users:** It would be great to study the major socio-economic effects brought by improving access to advanced diagnostic service through PPP mechanism on patients.
- **Logistics and Sample Transport Models:** Since accessing diagnostic services through samples referral from all over the country demands an efficient and effective logistics system, it is good to assess the feasibility and effectiveness of logistics and sample transport systems to ensure sustainable success in PPP programs.

5. 5 Theoretical contribution of the study

Our study contributes to the theoretical aspects of PPP by introducing a framework for understanding the its implementation in healthcare services. By integrating the key factors that influence the success of Public-Private Partnerships, we provide a more comprehensive explanation for informed program analysis and decision-making. This approach not only utilizes the existing theories but also opens the way for future research in the area. The following are the key contributions we observed from this study:

- **Framework for Success in PPP Programs** in healthcare services: the study contributes to understand PPP in healthcare by establishing a framework that focuses on the importance of service accessibility, operational flexibility, and information technology integration as key success factors.
- **Gender perception towards partnership:** the study adds value to the value of gender dynamics in healthcare services. It shows females perspective may influence the effectiveness of PPP program. This opens a door for further exploration of how gender impacts health service delivery and its outcomes.
- **Integration of Technology in healthcare programs**: the study shows the important role of Information Technology in improving operational processes within PPP programs. This tells that the need for healthcare systems to prioritize technological advancements as a means to improve the service delivery and the satisfaction of clients.

- **Operational flexibility as a success factor**: this study also brought an insight on how operational flexibility can lead to better partnership program outcomes. This can inform future researches to discover different flexibility approaches considering the rapidly changing internal and external situations.
- **Comprehensive evaluation measurement**: by providing the key variables that influence perception of success, our study encourages researchers to develop a more comprehensive evaluation measurements and tools to measure success in PPP programs.

5. 6 Policy Implications

The findings of this study suggest that policymakers should prioritize initiatives that enhance access to diagnostic services through partnership models with the private sector, incentivizing private partners to expand their reach and provide affordable services. Additionally, while developing or revising implementation frameworks, guidelines, and arrangements in PPP programs, the MoH of Ethiopia should allow for operational flexibility without compromising the quality and safety of the services. Furthermore, the government and the private sector investments in information technology for healthcare services should be advanced to sustain efficiency and ensure clients satisfaction. Lastly, the policy makers should enhance gender-sensitive policies that incorporate the experiences of women in such program planning and evaluation.

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Annex

Annex 1: Questionnaire

Section A: Questions on Background Information. Please use "✓or X" marking for your selected choice in the box

Sex

Male ☐ Female ☐

Age (In Year): _____

The highest level of Education

Specialist/Phd ☐ MSc/MBA ☐ MD ☐ BSc/BA ☐ Diploma ☐

Profession

Clinician ☐ Laboratory ☐ Other (Please specify) _____

Work experience in the current organization _____

Section B: Program Success Assessment

1. **Program success dimension "meeting design goals."**

	Question Item	**Yes**	**No**
1.1	The partnership program met the intended goal (access to quality assured diagnostic lab service for the needy communities)		
1.2	The partnership program met the cost goal		
1.3	The partnership program effectively addressed the needs (consistent lab diagnostic services) of the target communities.		
1.4	The partnership program improved the overall quality of diagnostic lab services provided.		

2. **Program success dimension "benefits to end user."**

	Question Item	**Yes**	**No**
2.1	The partnership program met the end user's (Patients/Clinicians) requirements of user charge		
2.2	The test results delivered to the end-user on time		
2.3	The partnership program substantially contributed for the improvement of the clinical quality of care		

2.4	The end users satisfied with the partnership program outcome		

3. **Program success dimension "benefits to public partner."**

	Question Item	**Yes**	**No**
4.1	The cost of the hospital decreases as expected due to the referral/back-up diagnostic service rendered by the International Clinical Laboratories		
4.2	The government reputation improved through this lab diagnostic service partnership program implementation		
4.3	The quality of the referral/back-up lab diagnostic service was met the hospital's requirement/expectations.		
4.4	The process to provide lab diagnostic service shortened		

4. **Program success dimension "preparing for the future."**

	Question Item	**Yes**	**No**
5.1	The local community benefited by getting better access to lab diagnostic services through the partnership program between the hospital & International Clinical Laboratories?		
5.2	Innovative approaches developed in the partnership program implementation?		
5.3	A new value was created on how to provide consistent lab diagnostic service for the future?		
5.4	Both the Hospital and International Clinical Laboratories have opportunities to adapt for future challenges and ensure consistent lab diagnostic services for the community.		

Section C: Assessment on factors influencing the PPP success

	Question Item	**Yes**	**No**
1	**Enhanced accessibility of service**		
	The partnership ensures that diagnostic services are consistently available to patients.		

2	**Service Turnaround Time**		
	Diagnostic results are provided within the expected time frames.		
3	**Operational Flexibility**		
	The partnership allows for adjustments in service operations based on demand.		
4	**Service affordability**		
	The cost of services provided under the partnership is affordable for the target communities.		
5	**Convenience of the Payment modalities**		
	The payment options provided are convenient for patients and healthcare providers.		
6	**Hospital timely payment (per the agreement) to the private partner**		
	The hospital consistently makes payments to the private partner on time.		
7	**Financial Viability of the program**		
	The partnership is financially sustainable		
8	**Communication**		
10.1	There is effective communication between the hospital and the private partner.		
9	**Application of Information Technology**		
	Information technology is effectively utilized to streamline service operations including the test results delivery		
10	**Clinicians satisfaction**		
	Clinicians feel confident in the quality of services offered through the partnership.		