

Sustainable Public-Private Partnerships for Effective Management of South Africa's Public Health Infrastructure

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Abstract

South Africa's public health system continues to face persistent challenges associated with deteriorating infrastructure and limited capital investment. These challenges have contributed to overcrowded healthcare facilities and inequitable service delivery across many parts of the country. While the public sector provides healthcare services to most of the population, the private healthcare sector serves a smaller proportion of citizens and has comparatively greater access to resources and infrastructure. To address these constraints, Public-Private Partnerships (PPPs) have been increasingly used to leverage private sector expertise, resources, and efficiency in delivering infrastructure and public services. Despite their potential, PPP outcomes have been uneven, often hindered by complex stakeholder dynamics, fragmented policy frameworks, weak governance, inadequate risk-sharing, and insufficient long-term planning. While some projects have delivered high-quality facilities, others have stalled due to mismanagement or conflicting priorities, highlighting a critical gap in sustainable implementation. This study acknowledges that the sustainability of healthcare PPPs extends beyond the successful delivery of physical infrastructure and includes the ability of such infrastructure to support accessible, efficient, and quality healthcare service delivery over time. Existing literature tends to examine governance, sustainability, and stakeholder management as separate concepts, with limited focus on how these factors collectively influence public health infrastructure management within the South African context. This study employs a systematic literature review (SLR) guided by the PRISMA framework and analyses 28 selected studies to examine how sustainability can be integrated into all strategic phases of PPPs, from design and financing to governance and post-project adaptation, to improve infrastructure management and service quality in the public health sector. The findings reveal that fragmented governance structures, stakeholder misalignment, and coordination challenges are among the key barriers affecting the long-term sustainability of healthcare PPPs. The findings provide insights for developing effective, long-term, sustainable PPP models that enhance public health infrastructure resilience and service delivery. This study contributes to the body of knowledge by bringing together previously fragmented literature on healthcare PPPs, emphasising the interconnected role of governance, stakeholder engagement, and sustainability in developing the effective management of public health infrastructure in South Africa.

Keywords: Public-Private Partnerships, sustainability, public health infrastructure, governance.

1. Introduction

The public health sector in South Africa delivers services to millions of its population and is essential in ensuring equal access to healthcare. However, the sector continues to face persistent and complex issues, including outdated infrastructure, inadequate maintenance of healthcare facilities, limited capital investment, and rising demand driven by an expanding population and disease burden (Joudyian et al., 2021). The aforementioned problems have led to overcrowded facilities, inadequate service delivery, and increased inequalities between the public and private healthcare systems.

In response to these challenges, South African governments have come to rely on Public-Private Partnerships (PPPs) as a means of leveraging private sector experience, resources, and efficiency to deliver vital public services and infrastructure projects (Mbaka

& Mwange, 2023). The PPP model has been recognised as a vital instrument to enhance public health systems and prevent the growing costs of an already costly and unsustainable healthcare sector (Mazibuko et al., 2023). PPPs are frequently used for public infrastructure projects to address the issues of funding, knowledge, risk sharing, effectiveness, innovation, on-time delivery, and long-term sustainability (Hailu & Tshehla, 2024). PPPs contribute to sustainability by promoting economic growth, infrastructural development, and institutional improvement, aligning with the United Nations Sustainable Development Goals (Kumar et al., 2025). However, to succeed in PPP, stakeholders must be committed, communicate openly, and share risks effectively.

PPPs are widely acknowledged as potential mechanisms for achieving sustainability goals, although empirical data remains unclear (Kumar et al., 2025). They have emerged as a critical strategy for

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improving infrastructure delivery within South Africa's public health sector, although there remains a significant gap in understanding how sustainability can be effectively coordinated across all strategic phases of a PPP, from design and financing to long-term governance and post-project adaptation.

Despite their significant usage, PPPs remain complex and context dependent. Although PPPs can improve infrastructure quality and efficiency, their effects are usually inconsistent due to governance issues, contractual complications, and organisational limitations. Understanding and learning from these obstacles is key to optimising PPP programmes' success. In this study, sustainability and effective management are viewed as interconnected concepts, where long-term infrastructure sustainability depends on effective governance, stakeholder coordination, financial accountability, and continuous operational performance throughout the PPP lifecycle. The study therefore recognises that successful PPP implementation extends beyond infrastructure development to include governance effectiveness, stakeholder coordination, operational sustainability, and healthcare service outcomes. This study, therefore, aims to critically examine sustainable PPPs for the effective management of public health infrastructure in South Africa through a systematic literature review approach.

1.1. Research Objective

The main objective of this study is to critically examine sustainable PPPs for the effective management of public health infrastructure in South Africa through a systematic literature review approach.

The study specifically seeks to:

- examine the role of governance in the sustainability of healthcare PPPs;
- explore the influence of stakeholder alignment and collaboration in PPP healthcare infrastructure management.

2. Literature review

This section critically reviews the literature on sustainable Public–Private Partnerships (PPPs) for Effective Management of South Africa's Public Health Infrastructure. The review is organised around five interrelated themes derived from the study objectives, study title, keywords and existing PPP literature, namely: PPPs in healthcare, sustainability, governance, stakeholder engagement, and an integrated perspective on sustainable PPPs for effective management. These themes collectively provide a broader understanding of the factors influencing the long-term sustainability and operational effectiveness of healthcare PPPs.

2.1. Overview of Public–Private Partnerships

PPP is defined as a contractual arrangement between the public and private sectors/entities for the provision of public goods and services, founded on mutually agreed-upon objectives (Kanti et al., 2020). It entails long-term cooperation between the public and private sectors, as stated by (Liu et al., 2023).

In practice, PPPs are widely employed in public infrastructure projects to address challenges such as funding shortages, knowledge gaps, risk allocation, efficiency, innovation, timely delivery, and long-term sustainability (Hailu & Tshehla, 2024). In this context, PPPs shift the government's role from direct investor and operator to policymaker, regulator, and supervisor of service quality and quantity, with the private sector assuming substantial operational and development risks (Tabrizi et al., 2020). PPPs in healthcare are joint efforts by government bodies, private organisations, and occasionally non-profit institutions to address healthcare concerns via innovation (Ebulue et al., 2024). In the healthcare sector, PPPs have evidently played a vital role in boosting service delivery and infrastructure development in developing nations (Salangwa et al., 2025). They have gained popularity for improving healthcare funding and service delivery, especially in a resource-constrained setting (Sarkar, et al., 2025). PPPs attempt to strengthen the healthcare system by boosting many components, including service delivery, governance, financing, and the availability of medical products (Salangwa et al., 2025). These collaborations can range from straightforward franchising, which aims to privately run an already-existing hospital, to full-service provision at all levels of care, which is essentially defined by combining the hospital and primary care facilities to offer community care (Ferreira & Marques, 2020). By combining resources, knowledge, and responsibilities, PPPs aim to exploit the capabilities of each sector for the collective benefit of society (Ebulue et al., 2024).

Despite their theoretical advantage, other literature reports that as more projects enter the implementation phase, the effectiveness of PPPs is being called into question due to emerging conflicts that threaten their sustainability (Onyoin, 2022). Samira Abdul et al., (2024) 's research supported that there is a growing need to rigorously evaluate and assess the impact of PPPs initiatives to determine their real contribution to healthcare outcomes, sustainability, and long-term effectiveness.

In recent years, PPPs have played an important role in addressing South Africa's healthcare needs, especially given limited resources and rising healthcare service demand (Sarkar, et al., 2025). This is reflected in collaborative initiatives between government and private entities, such as the co-location of clinical care management at Humansdorp District Hospital in the

Eastern Cape and at Universitas and Pelanomi Hospitals in the Free State (Mbaka & Mwange, 2023). Dlamini & Botes (2022) contend that, despite more than two decades of PPP implementation, the results have been largely unsatisfactory, particularly regarding infrastructure development, upgrading, operations, maintenance, and management across all spheres of government. Furthermore, PPP projects are frequently characterised by delays in completion, failure to achieve intended delivery targets, and challenges related to financial mismanagement and corruption (Dlamini & Botes, 2022).

2.2. Sustainability in the health sector

The sustainable development agenda recognises health as a component of all the SDGs and a critical feature of the process of achieving an equal and sustainable future (Kimario et al., 2020). Sustainability is conceptualised as the capacity to make responsible decisions regarding the allocation and use of resources in both economic and non-economic activities to generate desired social, economic, and environmental outcomes (Ozili, 2022), or, more broadly, as the ability to persist consistently over time (Tipu et al., 2024). Within healthcare infrastructure, sustainability specifically refers to the capacity of facilities to maintain operational performance, deliver continuous services, and remain economically viable over the long term (Njuguna et al., 2024). Strasser et al. (2021) emphasise that sustainability enables healthcare organisations to adapt to changing demands without compromising service quality or accessibility. Correspondingly, sustainable healthcare projects focus on cost-effective operations, alleviating financial pressures on the public sector while ensuring the consistent provision of high-quality services (Njuguna et al., 2024).

2.3. Governance and stakeholder engagement

Governance can be viewed as the set of activities and actions undertaken by a governing body to provide strategy and steer the organization toward achieving its goals (Oliveira et al., 2023). Core functions include defining objectives, determining how to achieve them, monitoring progress to ensure performance, and managing stakeholder relationships (Oliveira et al., 2023). Governance practices align the interests of many stakeholders, converting principles into objective recommendations (Oliveira, Fernandes & Pardini, 2023). In the context of PPPs, extensive stakeholder engagement supports transparency and fosters sustainability (Sheppard & Beck, 2020). Strong governance structures and active collaboration among stakeholders are therefore critical for the long-term success of PPP initiatives (Kumar et al., 2025). They take action to maximise long-term value, extending the organization's lifespan and quality of management (Oliveira et al., 2023).

However, the differing perspectives, interests, and value systems of the public and private sectors present

challenges for coordination and alignment (Verweij & Van Meerkerk, 2020). The literature indicates that PPPs are distinguished from other interdependent alliances by their contractual arrangements, partner characteristics, and expected public outputs (Liu et al., 2023). Success in PPP projects is closely linked to the quality of relationships and coordination between partners (Tipu & Yousaf, 2022). Considering the complexity of governance in healthcare organisations, critically examining governance configurations provides managerial insights for implementing sustainability-oriented PPPs (De Matteis et al., 2024).

3. Research methodology

This study uses a systematic literature review (SLR) as the main research design to investigate sustainable PPPs for the effective management of public health infrastructure in South Africa.

The SLR methodology establishes an organised, transparent, and replicable procedure for discovering, analysing, and synthesising existing scholarly data. Using systematic reviews facilitates the distribution of research findings and promotes debate (Nazir & Das, 2025). Systematic reviews offer comprehensive information on a certain relevant subject, pointing out inconsistencies and knowledge gaps that prevent empirical generalisations in an area of study (Kumar et al., 2025). The author of this study used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology to report the systematic review. The PRISMA framework used in this study aims to ensure high-quality reporting and an efficient peer-review process (Nazir & Das, 2025).

The use of a systematic literature review is justified by the study's goal of synthesising current knowledge and identifying best practices for sustainable PPPs in healthcare infrastructure. Unlike primary research methods, the SLR enables a broad and in-depth examination of existing information, making it ideal for theory formulation and framework development.

Data were gathered through a systematic search of trusted academic databases, including Scopus, my UNISA library, ScienceDirect, and Google Scholar, to ensure broad, multidisciplinary coverage of peer-reviewed literature. The timeframe for the search was limited to studies published between 2010 and 2026 to capture contemporary developments in healthcare PPPs. Keywords were carefully chosen to reflect the various terminologies on the concept of the research topic. A specified search strategy was formulated by employing relevant keywords such as "public-private partnerships," "PPP," "healthcare infrastructure," "sustainability," "governance, and "public-private partnership."

3.1. Inclusion and exclusion

To ensure the quality and relevance of the selected studies, established inclusion and exclusion criteria were used:

Inclusion requirements included peer-reviewed articles Publications between 2010 and 2026, Studies focusing on PPPs in healthcare or infrastructure, and key policy reports addressing health-sector PPPs in any South African context, with explicit discussion of sustainability in at least one lifecycle phase.

Exclusion criteria encompassed non-peer-reviewed sources, studies unrelated to PPP healthcare infrastructure, non-health PPPs, and duplicate records. To promote transparency and reproducibility, the study selection process was conducted using the PRISMA methodology. The PRISMA method is a widely established guideline for conducting systematic reviews (SR) in clinical publications (Mishra & Mishra, 2023).

3.2. Study selection process

The study selection procedure followed the PRISMA framework, to improve transparency, reproducibility, and methodological rigour (Moher et al., 2009), which consists of four essential stages. The stages are as follows: Identification: retrieval of studies from selected databases, Screening: removing duplicates and

unnecessary studies, Eligibility: analysis of full-text publications against criteria, and Inclusion: final selection of studies for analysis (Figure 1).

A total of 168 were initially identified through database searching. After removing duplicates, 120 were screened based on title and abstract relevance. Full-text screening was conducted on 52 articles, after which 28 studies met the inclusion criteria and were included in the final synthesis. The following diagram was developed to illustrate the study selection process:

3.3. Justification of Final Sample

The final inclusion of 28 studies was based on strict relevance criteria aligned with the research objectives. Only studies that explicitly addressed Public–Private Partnerships in healthcare infrastructure and included discussions on sustainability, governance, or stakeholder engagement were retained. This ensured that the final synthesis was focused, methodologically rigorous, and directly relevant to the research.

3.4. Data analysis

Thematic analysis was used to analyse the selected studies, which is suitable for synthesising qualitative data from diverse sources. Thematic analysis (TA) is a common technique for analysing qualitative data. It provides a structured but flexible framework for

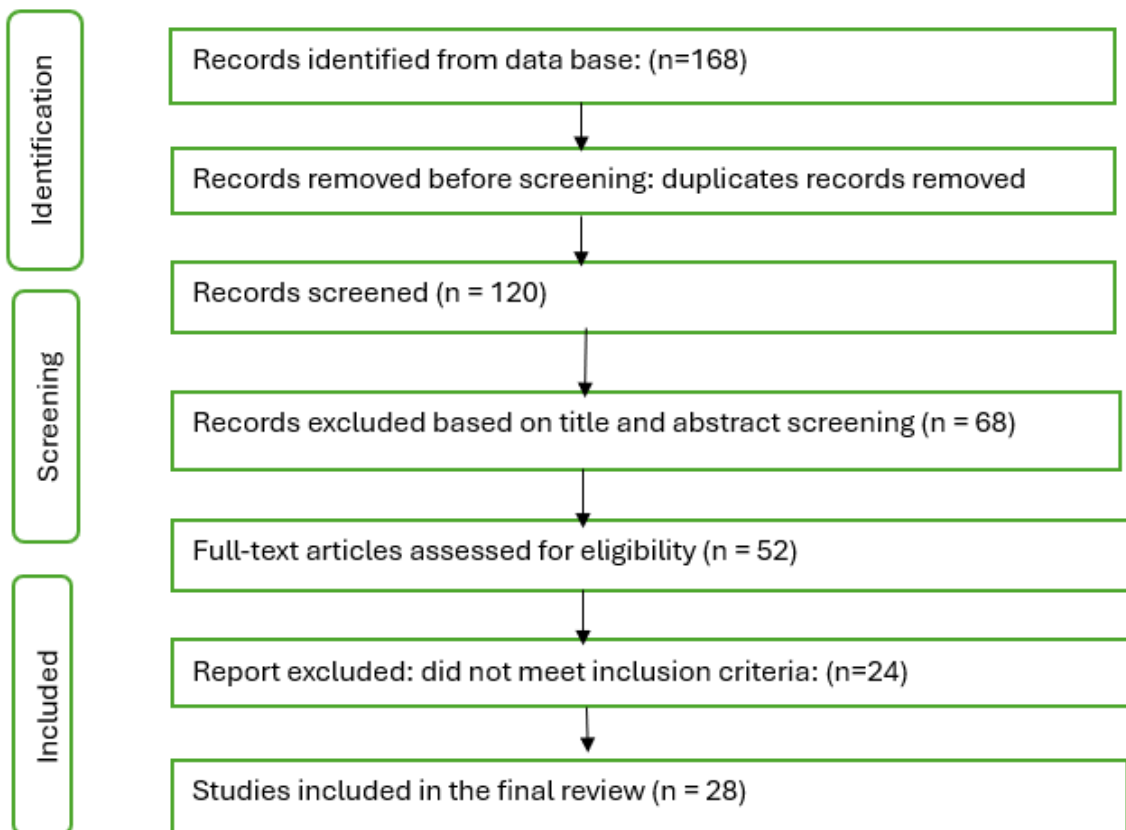


Figure 1: PRISMA Flow Diagram of Study Selection Process

identifying and interpreting patterns of meaning within data sets (Ahmed et al., 2025). This approach enabled the identification and classification of recurring themes relevant to the study topics.

4. Findings

This research study adopted a systematic review of published literature guided by the PRISMA 2020 framework. After applying inclusion/exclusion criteria to ensure relevance to sustainable PPP management in healthcare, 28 papers were selected for analysis (see Table 1). These studies focus on PPP definitions, implementation, sustainability, governance frameworks, and stakeholder alignment in healthcare infrastructure. The study conducted a systematic literature review to map out the main research areas on sustainable PPP management in the health sector. Most of the studies used mixed methodologies, including qualitative, quantitative, descriptive, and systematic review methods.

This section presents the findings from the systematic

4.1. Stakeholder management alignment in the PPP Health sector

Stakeholder alignment has been identified as a significant aspect determining the sustainability of public-private partnerships in healthcare infrastructure. PPPs involve a variety of stakeholders, including government organisations, private sector partners, healthcare professionals, and communities, each with their own goals and expectations.

South Africa's approach to healthcare PPPs is based on a comprehensive framework supported by national regulations, including the National Health Act and the Public Finance Management Act (Sarkar et al., 2025). These policies define the engagements and duties in health partnership projects (Sarkar et al., 2025).

Authors acknowledge that stakeholder involvement and participation are critical components of governance and accountability models for public-private partnerships in healthcare infrastructure management (Aminu-Ibrahim & Ogbete, 2024).

Table 1: Themes and Authors in Sustainable Healthcare PPP Literature

Themes	Authors
Stakeholder management alignment in the PPP Health sector	Aminu-Ibrahim & Ogbete, 2024; Sarkar, et al., 2025; Rybnicek, 2020; Mazibuko et al., 2025, Oliveira, et al., 2023
Governance	Oliveira, et al., 2023; Kumar, et al., 2025; Moro-Visconti, 2025; De Matteis et al., 2024; Sheppard & Beck, 2020; Verweij & van Meerkerk, 2021; Liu et al., 2023; Tipu & Yousaf, 2022; Aminu-Ibrahim & Ogbete, 2024
Public-Private Partnerships (PPPs) in healthcare	Sarkar, et al., 2025; Mbaka & Mwange, 2023; Dlamini & Botes, 2022; Hailu & Tshehla, 2024; Liu, Shi et al., 2023; Ferreira & Marques, 2020; Ebulue, et al., 2024; Onyoin, 2022; Samira Abdul et al., 2024; Joudyian, et al., 2021; Kanti et al., 2020; Tabrizi, et al., 2020
Integrated Perspective on Sustainable Public-Private Partnerships for Effective Management	Kimario et al., 2020; Ozili, 2022; Tipu et al., 2024; Njuguna, Nteere & Kirima, 2024a; Strasser et al., 2021; Salangwa, Munthali et al., 2025; Sarkar, Singhal et al., 2025; Moro-Visconti, 2025

literature review and analyses how they relate to the study's research questions. The research is based on a thematic analysis of selected studies, with an emphasis on sustainability, governance, and stakeholder management in PPP healthcare infrastructure.

The findings indicate that, while PPPs have great potential to improve public health infrastructure, their performance relies on the integration of numerous interconnected factors. A common pattern in the literature is the fragmented implementation of PPP components, which threatens long-term sustainability and operational performance. Table 1 demonstrates the themes and authors used in the inclusion of this literature

Some authors believe that PPPs are riskier than ordinary projects due to multiple stakeholders, complex project arrangements, specific funding, documentation, and tax laws, and a lack of skilled partners (Rybnicek, 2020). The literature indicates that misalignment of stakeholder interests often leads to conflicts, inefficiencies, and compromised service delivery, hence the risky mentality. Stakeholder complexity is particularly evident in healthcare PPPs, necessitating inclusive and participatory approaches to ensure that diverse interests align with shared objectives. In contrast, good stakeholder involvement and collaboration help to increase coordination and project success.

4.2. Governance

Governance emerges as a critical determinant of PPP success. According to the literature, governance structures and stakeholder engagement are essential to the long-term success and sustainability of PPP initiatives (Kumar et al., 2025). The literature emphasises that successful PPP implementation depends on strong governance structures, supported by transparent regulatory frameworks, well-defined accountability mechanisms, and effective institutional coordination.

Governance quality revealed as a key mediator of sustainability outcomes, increasing the benefits of PPPs in all three dimensions (Moro-Visconti, 2025). A significant takeaway from the findings is that governance should be understood as a dynamic and adaptive process rather than a static framework. Continuous oversight and institutional development are required to support long-term PPP outcomes.

4.3. Integrated Perspective on Sustainable Public-Private Partnerships for Effective Management

PPPs have become critical components in achieving sustainable development (Kumar et al., 2025). By utilising the resources and experience of the private sector, this collaborative strategic alignment can improve the sustainability of government services and promote a more equitable healthcare system (Mazibuko et al., 2025).

The findings of this study add to the current body of knowledge by indicating that the efficiency of PPPs in healthcare infrastructure depends not only on the model itself but also on how key components are integrated and managed. A critical integration of the research demonstrates that governance frameworks and stakeholder alignment impact sustainability in PPP healthcare infrastructure management. These factors are frequently discussed separately in the literature, resulting in fragmented implementation and uneven results.

5. Conclusions

PPPs represent a promising strategic approach to addressing healthcare infrastructure challenges, particularly in resource-constrained environments. This review has demonstrated that PPPs can enhance service

delivery, improve infrastructure quality, and promote innovation when effectively implemented. In contrast, the findings show that the sustainability of healthcare PPPs is significantly affected by governance quality, stakeholder alignment, and institutional coordination throughout the PPP period. The study further found that fragmented implementation approaches, weak coordination among stakeholders, and governance limitations often undermine operational performance and sustainability outcomes.

Despite the growing body of literature, significant gaps remain most notably the absence of comprehensive and standardised frameworks to assess PPP performance and outcomes over time. This study contributes to the body of knowledge by integrating previously fragmented literature on healthcare PPPs, emphasising the interconnected role of governance, stakeholder engagement, and sustainability in ensuring the effective management of public health infrastructure in South Africa. The study therefore recommends stronger governance and accountability frameworks, continuous stakeholder collaboration, and integrated monitoring systems to support long-term sustainability and operational effectiveness within healthcare PPPs. Future research should therefore prioritise the development of integrated evaluation models and empirical studies that capture long-term impacts. Strengthening these areas will be critical to maximising the effectiveness of PPPs and ensuring their contribution to resilient and sustainable healthcare systems.

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