A STUDY ON THE QUALITY DIFFERENTIAL IN THE DELIVERY OF HEALTHCARE SERVICES THROUGH PUBLIC-PRIVATE PARTNERSHIP MODE

Doctoral Thesis

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by

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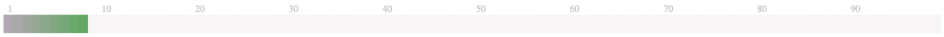

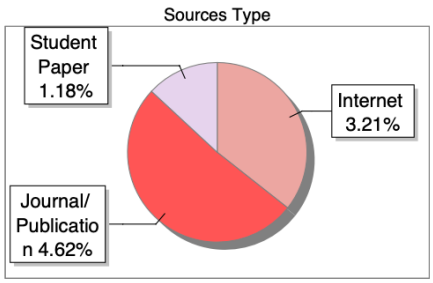

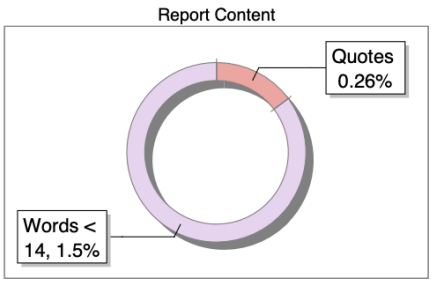

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ABSTRACT

This study investigates the quality differentials between public and private healthcare facilities in Jharkhand, India under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme. Jharkhand faces significant challenges in providing accessible and quality healthcare, particularly in rural and remote areas. The study aims to assess the availability and accessibility of healthcare services, the impact of government initiatives on healthcare quality, and the potential of Public-Private Partnerships (PPPs) to improve healthcare delivery in underserved areas.

A mixed-methods approach was employed, combining quantitative analysis of patient outcomes and satisfaction surveys with qualitative interviews of healthcare providers and administrators. The study found that while PPPs generally performed better in terms of patient satisfaction and certain quality indicators like waiting times and facility cleanliness, challenges persist in ensuring consistent quality across all PPP projects.

The findings highlight the need for robust governance mechanisms, regulatory frameworks, and monitoring systems to ensure the quality and equity of healthcare services delivered through PPPs. By examining healthcare availability, accessibility, affordability, and quality in Jharkhand, the study offers a comprehensive assessment of health system performance under AB-PMJAY. The insights can inform targeted interventions to address systemic challenges and optimize the scheme's impact on improving access to quality healthcare for vulnerable populations in resource-constrained settings like Jharkhand.

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LIST OF ABBREVIATIONS

DHs	District Hospitals
HMIS	Health Management Information System
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HWCs	Health & Wellness Centres
IIB	Insurance Information Bureau
IPD	Inpatient Department
JStor	Journal Storage
LMICs	Low- and Middle-Income Countries
NGOs	Non-Governmental Organizations
NFHS	National Family Health Survey
OLS	Ordinary Least Squares
OOP	Out-of-Pocket
OPD	Outpatient Department
PCA	Principal Component Analysis
PHCs	Primary Health Centres
PM-JAY	Pradhan Mantri Jan Arogya Yojana
PPP	Public-Private Partnership
PQS	Perceived Quality Score
PREMs	Patient-Reported Experience Measures
PROMs	Patient-Reported Outcome Measures
RSBY	Rashtriya Swasthya Bima Yojana
SCs	Sub Centres
SDHs	Sub-District Hospitals
SGDP	State Gross Domestic Product
TQM	Total Quality Management
UHC	Universal Health Coverage
WHO	World Health Organization

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CHAPTER I
INTRODUCTION

Chapter 1 | INTRODUCTION

1.1 Introduction

Health is not merely the absence of disease, but also the ability of individuals to fully develop their potential throughout their lives. This multidimensional concept of health has significant implications for economic growth and development. Health directly affects economic productivity by increasing labour output, reducing illness-related absenteeism, and indirectly enhancing development through improved school enrolment and educational attainment (Ivinson, 2002). As the World Health Organization (WHO) defines it, health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO). Healthy individuals are central to a country's development, as they are able to perform their work efficiently and thereby create wealth. The collective prosperity of these healthy citizens then increases the overall wealth and economic strength of the nation. Therefore, health contributes to a country's productivity in ways that transcend the mere absence of disease and injury.

The importance of health has long been recognized by social thinkers and policymakers. The 1978 Alma-Ata Declaration marked a pivotal moment in the 20th century field of public health, establishing the goal of "Health for All." This was followed by the 1998 "Health for All in the 21st Century" declaration, which expanded on the Alma-Ata framework by highlighting the need for ensuring health security, achieving global health equity, increasing healthy life expectancy, and guaranteeing access to quality essential health care for all (WHO, 1998). Public health has also been a key focus of the United Nations Millennium Development Goals, with many of the targets directly related to population health. Given this widespread recognition of health's centrality to development, it is crucial to build a robust health infrastructure that can provide affordable, accessible, and high-quality health services to all parts of a country. Such an approach would lead to better health outcomes and, consequently, higher standards of living.

1.2 Health as a Public Good

The definition of health extends beyond physical well-being to include mental and social aspects. This broader definition necessitates a more comprehensive approach to public health initiatives, encompassing mental health services, social support programs, and policies that address social determinants of health like poverty, housing instability, and food insecurity. The concept of health as a public good is complex and multifaceted, with various interpretations and implications. A public good is generally characterized by two key features: no excludability, where everyone benefits from it regardless of their contribution, and non-rivalry,

where consumption by one person does not diminish its availability for others (Samuelson, 1954).

While health benefits everyone, individuals have a significant role in maintaining and improving their own health. This raises the question of how to balance individual responsibility with collective efforts. Public policy can incentivize healthy choices through education, access to healthy food and exercise opportunities, and preventive healthcare measures. However, the issue of "free riders" who benefit from public health efforts without contributing remains a challenge. Limited resources pose a further challenge in allocating funds between individual healthcare and public health initiatives.

While individual needs are important, investing in public health infrastructure and preventive measures can yield long-term benefits for the entire population. Finding a balance between individual and public health requires careful consideration of the potential benefits and costs of different interventions. Economic analyses can quantify the economic benefits of public health investments, such as reduced healthcare costs, increased productivity, and longer lifespans (Bloom et al., 2004). This evidence can help advocate for increased funding for public health initiatives and demonstrate the value of collective action in protecting and promoting health. Public health interventions must be implemented ethically, respecting individual autonomy, privacy, and justice. This requires transparent communication, informed consent, and mechanisms for addressing potential harms.

Recognizing health as a public good requires a shift from focusing solely on individual medical care to addressing the broader social and environmental factors that influence health. This necessitates collaboration between governments, public health agencies, healthcare providers, communities, and individuals to create a society where everyone could achieve optimal health.

1.3 Healthcare Management

The term healthcare management (or healthcare administration) refers to the oversight and supervision of healthcare organizations, including hospitals, clinics, and public health systems (Longest, 2014). Healthcare managers are tasked with providing leadership, management, and direction to these healthcare units to ensure the efficient and effective delivery of available healthcare services. This encompasses planning, organizing, coordinating, and controlling resources to optimize the provision of healthcare (Ginter et al., 2018). Healthcare management is a specialized branch of management that requires a unique set of knowledge and skills. In addition to a deep understanding of healthcare operations and technology, healthcare managers must possess soft skills such as the ability to motivate team members, collaborate with multiple stakeholders, and proactively implement needed changes (Buchbinder & Shanks, 2017).

The public and private sectors in healthcare have distinct objectives and approaches. The public sector aims to increase welfare through the provision of public healthcare services, while the private sector focuses on enhancing the commercial value of healthcare resources (Barlow, 2002). Private sector involvement in healthcare, often through public-private partnerships (PPPs), has the potential to exploit the commercial potential of government assets and complement the public sector's efforts to improve healthcare access and quality (Barlow et al., 2013).

The multifaceted nature of healthcare management underscores the importance of a well-rounded approach that integrates technical expertise, leadership abilities, and an understanding of the complex interplay between the public and private sectors. Effective healthcare management is crucial for ensuring the optimal delivery of healthcare services and improving population health outcomes.

1.3.1 Key Responsibilities

The major responsibilities of the hospital management includes following:

Table:1.1 *Key Responsibilities of Hospital Management*

Category	**Responsibilities**
Financial management	Budgeting, cost analysis, revenue generation, resource allocation
Operational management	Staffing, scheduling, workflow optimization, quality control
Strategic planning	Setting goals, identifying opportunities, developing strategies for future growth
Risk management	Identifying, assessing, and mitigating potential risks to patients, staff, and the organization
Compliance	Ensuring adherence to regulations and legal requirements
Human-resource management	Recruitment, training, performance management, employee relations
Information technology management	Implementing and utilizing technology to improve efficiency and patient care

1.3.2 Importance of Healthcare Management

Healthcare management plays a crucial role in ensuring the smooth and efficient functioning of healthcare systems. Its significance can be highlighted through the following key aspects:

1. Quality of Care: Effective healthcare management ensures that patients receive high quality care in a safe and efficient environment. This involves implementing best practices, optimizing workflows, and monitoring patient outcomes to ensure continuous improvement (Weinstein & Nesbitt, 2007).
2. Cost Containment: Healthcare costs are a major concern for individuals, governments, and organizations. Healthcare management plays a vital role in controlling costs by

optimizing resource allocation, reducing waste, and negotiating favourable contracts with suppliers (Shi & Singh, 2019).

3. Accessibility: Access to healthcare is a fundamental right. Healthcare management strives to improve access to services by expanding insurance coverage, reducing wait times, and developing innovative care delivery models (Longest, 2010).
4. Innovation: The healthcare field is constantly evolving, and healthcare management plays a key role in driving innovation. This involves supporting research and development, adopting new technologies, and implementing new treatment methods to improve patient outcomes (Ginter et al., 2018).
5. Public Health: Healthcare management extends beyond individual patients and plays a crucial role in addressing population-level health issues. This includes developing public health initiatives, promoting preventative care, and addressing social determinants of health (Longest, 2010).
6. Overall Efficiency: Healthcare management ensures the efficient and effective utilization of resources, including personnel, equipment, and technology. This leads to improved operational efficiency, reduced waste, and better patient outcomes (Buchbinder & Shanks, 2017).
7. Data-driven Decision Making: Healthcare management utilizes data analytics to make informed decisions about resource allocation, treatment strategies, and public health interventions. This data-driven approach ensures that decisions are based on evidence and lead to optimal outcomes (Shi & Singh, 2019).
8. Compliance with Regulations: Healthcare organizations are subject to a complex set of regulations. Healthcare management ensures compliance with these regulations to protect patients and maintain the organization's integrity (Longest, 2010).
9. Workforce Management: Healthcare management is responsible for attracting, developing, and retaining a skilled and motivated workforce. This includes creating a positive work environment, providing training and development opportunities, and offering competitive compensation and benefits (Buchbinder & Shanks, 2017).
10. Sustainability: Healthcare management focuses on ensuring the long-term sustainability of healthcare systems. This involves managing resources responsibly, investing in preventative care, and developing innovative solutions to address future challenges (Ginter et al., 2018).

Healthcare management is a critical and multi-faceted field that plays a vital role in ensuring the quality, accessibility, and sustainability of healthcare services. By effectively managing resources, driving innovation, and responding to emerging challenges, healthcare management can contribute to a healthier population and a more efficient healthcare system.

1.4 Public Private Partnership in Healthcare Management

Insufficiencies in the government-owned healthcare system in offering comprehensive healthcare services to the populace are well documented in the existing literature (Raman et al., 2012). A fraction of the population is compelled to seek private healthcare services due to the limited capacity of the public healthcare sector to serve the entire population. In this context, public-private partnerships (PPPs) can play a significant role in the delivery of healthcare services. In fact, PPPs are observed to be playing an increasingly important role in developing the performance of healthcare systems globally (Mitchell, 2008).

Under health PPPs, the private sector is responsible for designing, constructing, maintaining, and operating hospitals, while the public sector undertakes basic health services such as patient care and the recruitment of doctors and nurses (Ondategui-Parra, 2009). The government has the experience and expertise to deliver clinical services and ensure good care for patients' health, while non-critical services are managed by the private sector (Ondategui-Parra, 2009). There is no single, universally accepted definition of PPPs, but the PPP Knowledge Lab (World Bank Group) defines a PPP as "a long-term contract between a private party and a government agency to provide a public good or service, in which the private party assumes significant management responsibility and risk, as well as compensation related to performance." India has systematically deployed a PPP program to deliver high-priority public services and infrastructure, and over the past decade, it has developed one of the largest PPP programs in the world. According to the World Bank, nearly 2,000 PPP projects are identified at various stages of implementation across various sectors in India. India is one of the leading countries in terms of PPP readiness, and public-private partnerships are becoming increasingly important globally.

Jharkhand, a low-income state in eastern India, faces a significant shortfall in public health services, along with severe healthcare shortages, including diagnostic services. Lack of quality diagnostic services and standards forces people to forgo them or purchase services from private facilities, often of poor and inconsistent quality, and incur large out-of-pocket costs, excessive travel, and testing costs. To address these challenges, the Government of Jharkhand sought the support of the International Finance Corporation (IFC) to structure and implement radiology and pathology centers in the form of public-private partnerships. The IFC helped the Government of Jharkhand to establish a PPP model in the healthcare sector to develop radiology centers across the state in collaboration with HealthMap Diagnostics Private Limited (a joint venture of a major Indian healthcare company, Manipal Health, and Philips) on November 16, 2015. Similarly, the IFC assisted the government in establishing PPP pathology centres across the state in collaboration with Mell Healthcare Private Limited and SRL Limited

on April 30, 2015, and May 8, 2015. During the COVID-19 pandemic, 500 beds were allocated at Sadar Hospital, Ranchi under the PPP mode, and even lower-level hospitals were allotted 300 beds under the same PPP mode, with the state government constructing the necessary buildings.

This study aims to measure the overall healthcare in the region based on demographic, socioeconomic, and quality differences provided, to better understand the health of the people of Ranchi district of Jharkhand.

1.5 Public Health Infrastructure in India

The public health system in India is structured at three main levels: basic, secondary, and tertiary (Government of India, 2011). However, when this infrastructure is not distributed equally across the country, there are two alternative approaches to providing minimum health services to the population: improving the efficiency of public health facilities and introducing more private healthcare providers.

Increased efficiency in healthcare not only improves its performance but also increases the quantity of healthcare delivery and serves more people. The World Health Organization (WHO, 2000) emphasized the importance of the effectiveness of the health system, its activities, and ultimately achieving the goals of improving care, affordability, and equity in health care financing. While improving efficiency can certainly reduce disparities in healthcare access, it is equally crucial to provide a satisfactory level of patient satisfaction through the provision of quality healthcare services.

Patient satisfaction processes should be used to observe the performance of health services, especially in hospitals. Hospital staff must identify patients as their most important business partners. However, much of the frustration in patient relationships stems from the complexity of managing patient trust. Successful healthcare providers continually strive to provide a higher intensity of service to patients. The ability of healthcare facilities to provide timely and effective care to patients is essential to achieving this. Appropriate precautions should be taken regarding registration and admission, hospital cleanliness and comfort, physician care, nursing staff care, and final treatment outcomes, as well as issues related to fees and charges (Singh, 2012).

Hospital efficiency, a specific measure of hospital performance, is considered crucial for the overall development of health services and their accessibility to the public. In many underdeveloped and developing countries, where limitations in healthcare resources are common, healthcare consumers do not receive treatment that is appropriate in terms of quantity, quality, and timeliness. Hospital management agencies always aim to have the right

combination of inputs to provide better services to patients, such as more human resources, technical equipment, and infrastructure.

Due to the lack of basic healthcare resources, doctors and nurses often feel powerless to provide the best service to patients. In many cases, patients pay directly for medical services but end up paying more for a less valuable service because the hospital is inefficient. This leads to health imbalances and thus affects the entire society. Many underdeveloped and developing countries have lower health levels than developed countries, not only due to insufficient inputs but also due to the ineffective use of these resources. It is therefore necessary to highlight this shortcoming and find its causes and subsequent remedies, as hospitals are fundamental to collective thinking about happiness, illness, health systems, and medical spending standards (Ityavyar, 1988).

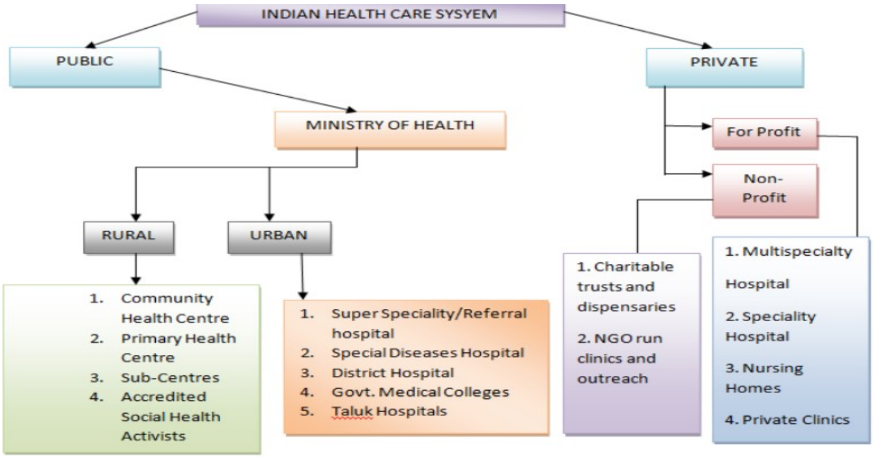


Figure:1.1 *Indian Healthcare System in India*

Source: Author

The healthcare network in India, measured by the number of hospitals beds, doctors, and nurses per capita, remains poor in some states (Chakraborty & Chakraborty, 2009). To fill this gap, several private sector hospitals have emerged, with user fees much higher than those in the public sector (Mackintosh et al., 2016). The second major policy change has been the reduction of public health spending, with structural adjustment policies imposing mandatory cuts in social sector financing at the central and state levels to reduce budget deficits (Purohit, 2001). This led to a decline in public health spending in the 1990s (Mooij & Dev, 2002), widening the gap between people's health needs and actual policy outcomes. Furthermore, reduced investment in public health and gradual increases in user fees in the public sector have created opportunities for the private sector to emerge and prosper (Peters et al., 2002).

The emergence of a dynamic private sector focused on opening to foreign countries and the subsequent increase in foreign patients has further increased treatment costs and healthcare insecurity for the poorest households. The growing import of medical equipment into India has also led to an increase in diagnostic test prescriptions by physicians (Morgan et al., 2016). To

address these challenges, the National Health Policy (2017) aims to ensure universal access to quality health services for all citizens "without anyone facing financial hardship." To achieve this goal, the policy emphasizes the need to ensure the free supply of medicines and diagnostics, with flexibility for states to adapt according to their contexts.

Several studies highlight the significant and positive impact of health insurance in improving access to healthcare and reducing costs (Swaminathan & Viswanathan, 2016; Sood et al., 2014). However, studies have also shown that insurance schemes such as the Rashtriya Swasthya Bima Yojana (RSBY) have no effect in reducing hospital participation and spending (Selvaraj & Karan, 2012; Shahrawat & Rao, 2011), and the probability of catastrophic health expenditure is only slightly reduced (Jayakrishnan et al., 2016; Nandi et al., 2013). Furthermore, certain estimates reveal that the probability of incurring total out-of-pocket expenditure increased by 30% (Karan et al., 2017; Katyal et al., 2015).

According to Folland et al. (2004), insurance plays two distinct roles in health funding. The first duty concentrates on raising health service revenue, which can be utilized to enhance and fortify the calibre and reach of delivery methods to increase people's access. In order to share and distribute individual health risks among insurance plan participants, the second job is pooling resources.

The most vulnerable members of society, low-income households and people, who frequently labor in the unorganized and informal sectors, are likewise more prone to hazards and have little capacity to handle crisis-related issues. Unfavourable occurrences and health shocks force low-income and impoverished households into worse circumstances. As a result, insurance is an effective means of ending the cycle of vulnerability and shortage. It is seen as a successful technique to expand or enhance the reach of social protection programs, particularly for the underprivileged. Numerous research have demonstrated that health insurance can improve health indicators, reduce vulnerability, increase constructive investment, and improve protection against financial shocks (Sood et al., 2014; Fonseca & Dalal, 2014; Fan et al., 2012).

1.6 Healthcare Delivery System in India

The healthcare delivery system in India is divided into two primary segments: public and private. The urban healthcare system has traditionally seen strong growth, largely driven by significant investments from the private sector. In contrast, rural areas, which account for the majority of healthcare demand, heavily rely on the public health system, despite an increasing presence of the private sector (Baru et al., 2010). It is widely acknowledged that public healthcare infrastructure in India is inadequate and often inaccessible to people living in rural areas. There is a shortage of hospitals and hospital beds, as well as a lack of intensive care facilities, diagnostic facilities, and blood banks (Balarajan et al., 2011). To improve public health facilities, substantial capital investments are required. However, full government

funding of healthcare is both impossible and undesirable, leading the government to explore innovative approaches, such as public-private partnerships (PPPs), to address public healthcare infrastructure challenges.

The PPP model in the Indian healthcare sector remains a subject of debate, with questions surrounding its potential for success and profitability for both taxpayers and the private sector (Bhat, 1996). The government has initiated several PPP projects, not only for support activities but also for critical services such as establishing catheterization laboratories, dialysis centers, and diagnostic laboratories. The primary goals of the government in pursuing PPPs are cost control and operational efficiency (Nishtar, 2004). However, rising healthcare costs make maintaining viable public-private partnerships quite challenging. PPPs in India are influenced by a dynamic and complex political, social, economic, and technological environment. These long-term, complex projects involve the merger of a private, for-profit entity and a slow developing public entity, which can lead to implementation difficulties due to a lack of clarity in the legal framework, poorly detailed contracts, and a lack of trust between the parties (Roehrich et al., 2014). Other obstacles to PPP implementation include the absence of regulatory and oversight bodies, delays in government payments, and the lack of evidence based pricing mechanisms. These challenges often discourage private actors from participating in PPPs, limiting the number and quality of contractors (Osei-Kyei & Chan, 2015).

Despite these challenges, the Indian healthcare system has made significant progress in recent years, including increased public health initiatives, the rise of the private sector, the launch of digital health initiatives, and a growing focus on preventive care. However, the system continues to face several critical issues, such as underfunding of public healthcare, inequities in access, shortages of healthcare professionals, and high out-of-pocket expenses (Balarajan et al., 2011). As the Indian healthcare system evolves, addressing these challenges and leveraging innovative approaches, such as well-designed and effectively implemented PPPs, will be crucial in improving access, quality, and affordability of healthcare services for all segments of the population.

1.7 Quality of Care

Quality of care refers to the degree to which healthcare services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. It encompasses a broad spectrum of factors that contribute to a positive patient experience and effective healthcare delivery.

1.7.1 Key Dimensions of Quality Care

Assessing the quality of healthcare services encompasses several crucial dimensions that collectively determine the overall effectiveness and impact of the system. These key dimensions include:

1. Effectiveness: This refers to the extent to which healthcare interventions and services achieve the intended outcomes and improve the health and well-being of patients (Donabedian, 1988). Effective healthcare not only addresses the presenting medical conditions but also takes a holistic approach to enhancing the patient's overall health status.
2. Safety: This dimension focuses on the absence of avoidable harm or injury to patients during the course of their care (Kohn et al., 1999). Healthcare systems must have robust mechanisms in place to identify and mitigate potential risks, ensuring that the care provided is safe and does not expose patients to unnecessary dangers.
3. Patient-centeredness: This aspect emphasizes the responsiveness of the healthcare system to individual patient needs, preferences, and values (Institute of Medicine, 2001). Truly patient-centered care recognizes the unique circumstances and priorities of each patient, tailoring the services accordingly to deliver a personalized and satisfactory experience.
4. Timeliness: This dimension addresses the provision of care in a timely manner, avoiding unnecessary delays and waiting times that can adversely affect patient outcomes (Institute of Medicine, 2001). Timely access to healthcare services is crucial for ensuring that patients receive the right care at the right time.
5. Efficiency: This refers to the effective utilization of resources, including personnel, equipment, and infrastructure, in a way that maximizes value and minimizes waste (Donabedian, 1988). Efficient healthcare systems optimize their operations to deliver high-quality services in a cost-effective manner.
6. Equity: This dimension ensures that all individuals, regardless of their socioeconomic status, race, or other factors, have equal access to quality healthcare services (Institute of Medicine, 2001). Equitable healthcare systems strive to address disparities and provide fair and inclusive access to all members of the population.

By considering these key dimensions, healthcare systems can develop a comprehensive framework for assessing and improving the quality of care, ultimately enhancing the overall well-being of the population they serve.

1.7.2 Importance of Quality Care

High-quality healthcare is essential for achieving optimal health outcomes for individuals and populations. The provision of such care leads to numerous benefits, which can be categorized as follows:

1. Improved Health Outcomes: High-quality healthcare has a direct impact on reducing mortality and morbidity rates, increasing life expectancy, and better managing chronic diseases (Donabedian, 1988). Effective and evidence-based interventions, coupled with a patient-centered approach, can significantly improve the overall health status of the population.
2. Enhanced Patient Satisfaction: When healthcare services are delivered with a focus on quality, it leads to increased trust and confidence in healthcare providers, greater satisfaction with the care received, and improved adherence to treatment plans (Institute of Medicine, 2001). Satisfied patients are more likely to actively engage in their own health management, further enhancing the effectiveness of the healthcare system.
3. Reduced Healthcare Costs: High-quality healthcare can contribute to lower utilization of unnecessary services, improved efficiency of care delivery, and minimized complications and readmissions (Donabedian, 1988). By optimizing the use of resources and reducing wasteful practices, high-quality healthcare can generate cost savings for both individuals and the healthcare system as a whole.
4. Strengthened Healthcare Systems: The provision of high-quality care can have a positive impact on the broader healthcare system. Improved public health outcomes, increased trust in healthcare institutions, and a stronger foundation for future innovation and advancements can all contribute to the overall resilience and sustainability of the healthcare system (Institute of Medicine, 2001).

By addressing the key dimensions of healthcare quality, including effectiveness, safety, patient-centeredness, timeliness, efficiency, and equity, healthcare systems can unlock these multifaceted benefits and ensure that individuals and populations receive the highest standard of care. This, in turn, can lead to better health outcomes, increased patient satisfaction, reduced healthcare costs, and a more robust and responsive healthcare system.

1.7.3 Challenges to Quality Care

The delivery of high-quality healthcare can be hindered by several complex and interrelated factors, including:

1. Limited Resources: Inadequate funding for the healthcare system, shortages of healthcare professionals, and lack of access to essential technologies and equipment can significantly constrain the ability to provide high-quality care (Aiken et al., 2012). Resource constraints can lead to overburdened healthcare facilities, long waiting times, and suboptimal service provision.
2. Fragmented Healthcare Systems: The lack of coordination and communication between different healthcare providers, such as primary care, specialists, and hospitals, can lead to delays in diagnosis and treatment, duplication of services, and inefficient use of resources (Misky et al., 2010). Fragmentation in healthcare delivery impedes the seamless and comprehensive management of patient care.
3. Patient Complexity: The increasing prevalence of chronic diseases, multimorbidity, and complex social determinants of health requires multifaceted interventions that can be challenging to deliver within the constraints of the healthcare system (Fortin et al., 2005). Patients with complex needs often require a coordinated, interdisciplinary approach to address their diverse healthcare and social needs.
4. Rapidly Evolving Medical Knowledge: Keeping healthcare professionals up to date with the latest advancements, evidence-based practices, and emerging treatment modalities can be a significant challenge (Bero et al., 1998). Rapid changes in medical knowledge and technology necessitate continuous professional development and effective knowledge translation mechanisms to ensure that healthcare providers deliver care that is aligned with the current standards of practice.

These barriers, individually and collectively, can undermine the ability of healthcare systems to deliver high-quality care that is effective, safe, patient-centered, timely, efficient, and equitable. Addressing these challenges requires a multifaceted approach that involves increased investment in healthcare resources, integration of healthcare services, strengthening of patient-centered care models, and continuous professional development for healthcare providers.

1.7.4 Strategies for Improving Quality of Care

Efforts to improve the quality of healthcare delivery require a multi-pronged approach that addresses various factors at different levels. Some of the key strategies include:

1. Investing in Healthcare Infrastructure and Resources: Allocating sufficient funding to the healthcare system, expanding the healthcare workforce, and ensuring access to advanced technologies can significantly enhance the capacity to deliver high-quality

care (Aiken et al., 2014). Adequate resources are crucial for addressing issues of limited access, long waiting times, and suboptimal service provision.

2. Promoting Patient-Centered Care: Empowering patients to actively participate in their care decisions, respecting their preferences, and providing culturally sensitive and compassionate care can foster a strong patient-provider partnership and improve overall satisfaction with the healthcare experience (Institute of Medicine, 2001). This approach recognizes the unique needs and values of each individual patient.
3. Advancing Quality Improvement Initiatives: Implementing data-driven monitoring and evaluation systems, identifying areas for improvement, and continuously implementing evidence-based practices can drive continuous quality enhancement (Donabedian, 1988). Systematic quality improvement efforts can help address issues of effectiveness, safety, and efficiency in healthcare delivery.
4. Fostering Collaboration and Coordination: Encouraging communication and collaboration between different healthcare providers, including primary care physicians, specialists, and public health officials, can improve the integration and continuity of care (Misky et al., 2010). Coordinated efforts can address the challenges of fragmented healthcare systems and ensure a more seamless patient experience.
5. Leveraging Technology: Utilizing digital health tools and telehealth services can improve access to care, enhance communication between patients and providers, and optimize the delivery of healthcare services (Dorsey & Topol, 2016). Technological innovations can help overcome barriers related to limited resources and patient complexity.

Delivering high-quality care is a continuous journey that requires ongoing commitment and collaboration from all stakeholders in the healthcare system. By understanding the key dimensions of quality care, addressing the existing challenges, and implementing effective improvement strategies, we can strive towards a future where all individuals have access to the high-quality care they deserve.

1.7.5 Clinical Outcome v/s Patient Satisfaction

Quality healthcare is a multifaceted concept that extends beyond the clinical aspects of care and medical infrastructure. It encompasses the holistic experiences of patients as they navigate the healthcare system. Patient satisfaction is a critical component of quality care, reflecting the patient's overall perception of the services they receive. This satisfaction is influenced by various factors, including the interpersonal skills of healthcare providers, communication effectiveness, accessibility and convenience of services, and the perceived competence of the

medical staff (Ware et al., 1983). Equally important is staff satisfaction, which plays a pivotal role in delivering high-quality care. A satisfied workforce is characterized by increased engagement, motivation, and commitment to providing excellent patient care. When healthcare professionals feel valued, supported, and empowered in their roles, they are more likely to go above and beyond in their interactions with patients, leading to better health outcomes and a more positive patient experience. Ultimately, the synergy between clinical excellence, patient satisfaction, and staff satisfaction forms the foundation of a healthcare system that prioritizes quality and puts the well-being of patients at the forefront.

1.8 Patient Satisfaction

Patient satisfaction with their healthcare provider benefits not only their frequent visits to the healthcare facility but also provides better awareness and satisfaction with their healthcare provider. This can be a positive step in the healing process. However, when considering different types of hospitals with varying management methods, the central goals of each type of hospital may differ. From a welfare state perspective, government-owned, operated, and controlled hospitals aim to provide medical services to all residents of the state with no or negligible compensation. In contrast, heterogeneous private hospital groups may operate with a different approach depending on their “for-profit” or “non-profit” organizational structure. Irrespective of the ownership model, the primary goal of expanding access to health services is to protect families and households from high out-of-pocket costs for medical expenses, including hospitalization.

Patient satisfaction is a critical component of quality care in healthcare. It refers to a patient’s overall perception of the healthcare services they receive, encompassing various factors (Ware et al., 1983):

1. Technical Quality of Care: This includes the professional competence of healthcare providers, the effectiveness of treatment, and the adequacy of diagnostic procedures.
2. Interpersonal Aspects of Care: This involves the communication, respect, empathy, and emotional support provided by healthcare professionals.
3. Physical Environment: This refers to the cleanliness, comfort, noise levels, and access to amenities in the healthcare facility.
4. Organizational Aspects of Care: This encompasses the timeliness of appointments, waiting times, efficiency of administrative procedures, and responsiveness to patient needs.

By addressing these multifaceted aspects of patient satisfaction, healthcare providers and organizations can enhance the overall quality of care, foster stronger patient-provider relationships, and improve health outcomes. Satisfied patients are more likely to adhere to treatment plans, actively participate in their care, and trust the healthcare system, leading to better health and wellness outcomes.

1.8.1 Importance of Patient Satisfaction

The benefits of achieving high levels of patient satisfaction in healthcare are multifaceted and far-reaching. Some of the key benefits include:

1. Improved Health Outcomes: Satisfied patients are more likely to adhere to treatment plans, attend follow-up appointments, and engage in healthy behaviors, ultimately leading to better health outcomes (DiMatteo, 1994). Improved adherence and engagement can enhance the effectiveness of healthcare interventions and contribute to better overall health.
2. Enhanced Patient Experience: Patient satisfaction contributes to a positive and comfortable healthcare experience, promoting trust in healthcare providers and fostering a sense of well-being (Ware et al., 1983). A positive experience can have a significant impact on the patient's perception of the quality of care and their willingness to seek healthcare services in the future.
3. Increased Loyalty and Referrals: Satisfied patients are more likely to return to the same healthcare provider and recommend them to others, leading to increased patient loyalty and referrals (Boshoff & Gray, 2004). This can be a valuable source of new patients and contribute to the growth and sustainability of a healthcare organization.
4. Improved Healthcare Reputation: High patient satisfaction can positively impact the reputation of a healthcare organization, attracting new patients and enhancing its competitiveness in the market (Boshoff & Gray, 2004). A strong reputation can be a valuable asset in the healthcare industry, where patients often make decisions based on the perceived quality of care.
5. Reduced Costs: Patient satisfaction can contribute to reduced healthcare costs by promoting preventive care, minimizing complications, and decreasing unnecessary readmissions (Boulding et al., 2011). Satisfied patients are more likely to follow recommended care plans, reducing the need for costly interventions and improving the overall efficiency of the healthcare system.

By prioritizing patient satisfaction and addressing the key factors that contribute to it, healthcare providers and organizations can unlock these multifaceted benefits, ultimately leading to improved health outcomes, enhanced patient experiences, increased loyalty, and more sustainable healthcare systems.

1.8.2 Factors Influencing Patient Satisfaction

Patient satisfaction in healthcare is a multifaceted construct that is influenced by various factors. Some of the key drivers of patient satisfaction include:

1. Communication: Building trust, resolving issues, and guaranteeing that treatment plans are understood all depend on healthcare providers and patients having effective communication (Ong et al., 1995). Positive patient experiences can be greatly enhanced by empathic and transparent communication.
2. Respect and Empathy: Patients value respectful and compassionate care that recognizes their individual needs and preferences. Healthcare providers who demonstrate genuine concern and empathy for their patients' well-being can foster stronger patient-provider relationships and enhance satisfaction (Mercer & Reynolds, 2002).
3. Timeliness and Efficiency: To increase patient satisfaction and enhance the overall experience, waiting periods must be kept to a minimum and care must be given promptly. Patients' opinions of the healthcare system can be improved by effective administrative procedures and simplified service delivery (Monnette et al., 2018).
4. Pain Management: Effective pain management is critical for patient comfort and satisfaction, contributing to positive perceptions of care. Addressing and controlling pain effectively can have a significant impact on patient experiences and outcomes (Jha et al., 2008).
5. Information and Education: Providing patients with clear and understandable information about their condition, treatment options, and expected outcomes empowers them to be active participants in their care. Effective patient education can lead to improved understanding, informed decision-making, and increased satisfaction (Boulding et al., 2011).

Patient satisfaction is a key indicator of quality care in healthcare. By understanding its importance, identifying its influencing factors, and implementing effective strategies for improvement, healthcare organizations can create a patient-centered environment that delivers high-quality care, promotes positive experiences, and ultimately leads to better health outcomes for all.

1.9 Staff Satisfaction

Staff satisfaction plays a crucial role in delivering high-quality care in healthcare settings. A satisfied workforce is more engaged, motivated, and committed to providing excellent patient care, leading to better outcomes and a more positive patient experience.

1.9.1 Impact of Staff Satisfaction on Quality of Care

In the context of healthcare organizations, employee satisfaction has been shown to have a significant impact on various aspects of patient care and organizational outcomes. This relationship can be academically framed as follows:

1. Enhanced Patient Care: Satisfied staff are more likely to provide compassionate, respectful, and attentive care to patients, leading to improved patient satisfaction and adherence to treatment plans (Harter, Schmidt, & Hayes, 2002; Locke, 1976).
2. Reduced Burnout and Turnover: High staff satisfaction contributes to a positive work environment and reduces burnout and turnover rates, ensuring continuity of care and preventing knowledge loss within the organization (Maslach, Schaufeli, & Leiter, 2001; Mobley, 1977).
3. Improved Team Collaboration: Satisfied staff are more likely to collaborate effectively with colleagues, leading to better communication, coordination, and overall patient safety (Salas, Sims, & Burke, 2005; Wheelan, Burchill, & Tilin, 2003).
4. Enhanced Recruitment and Retention: A reputation for high staff satisfaction attracts and retains top talent, strengthening the workforce and ensuring a skilled and experienced staff (Breaugh, 2008; Rynes, Bretz, & Gerhart, 1991).
5. Increased Innovation and Improvement: Satisfied staff are more open to change, willing to learn new skills, and participate in initiatives to improve the quality of care (Amabile, 1988; Herzberg, Mausner, & Snyderman, 1959).

These findings underscore the importance of fostering a positive work environment and prioritizing employee satisfaction in healthcare organizations, as it can lead to enhanced patient care, reduced burnout and turnover, improved team collaboration, strengthened recruitment and retention, and increased innovation and improvement (Locke, 1976; Maslach et al., 2001; Salas et al., 2005).

1.9.2 Factors Influencing Staff Satisfaction

The factors which impacts and influences the staff satisfaction is as follows:

1. Work Environment: Adequate staffing levels, manageable workloads, fair compensation and benefits, and positive relationships with colleagues have been shown to contribute significantly to staff satisfaction (Cavanagh, 1992; Spector, 1997).
2. Job Autonomy and Control: Feeling empowered to make decisions about patient care and having control over their work schedule can increase staff motivation and satisfaction (Hackman & Oldham, 1976; Spreitzer, 1995).
3. Professional Development Opportunities: Providing access to training and development programs allows staff to stay up to date with the latest advancements and enhance their skills, leading to increased confidence and job satisfaction (Maurer, 2001; Rowden & Conine, 2005).
4. Recognition and Appreciation: Acknowledging staff contributions, celebrating achievements, and providing opportunities for feedback and recognition can significantly boost morale and satisfaction (Locke, 1976; Maslow, 1943).
5. Leadership and Management: Effective leadership that fosters a supportive and collaborative environment, promotes open communication, and addresses staff concerns can significantly improve staff satisfaction (Bass, 1990; Yukl, 2012).

Investing in staff satisfaction is not just the right thing to do for employees, but it also makes good business sense. By creating a positive and supportive work environment, promoting staff well-being, and providing opportunities for growth and development, healthcare organizations can reap the benefits of a satisfied and engaged workforce, ultimately contributing to the delivery of high-quality care and improved patient outcomes (Harter et al., 2002; Maslach et al., 2001).

1.10 Healthcare Expenditure

In the context of healthcare, expenditure refers to the total amount of money spent on healthcare services and goods within a given period, typically a year. This includes both public and private spending and can be analysed from various perspectives (Getzen, 2013; Murthy & Okunade, 2009).

1.10.1 Components of Healthcare Expenditure

The major components of healthcare expenditure are given as:

1. Personal Health Care: This covers all services and goods directly related to individual medical treatment, such as doctor consultations, hospital stays, medication, and diagnostic tests (Cylus et al., 2016; OECD, 2021).

2. Public Health Services: This involves government spending on preventive care initiatives, public health infrastructure, disease surveillance, and immunization programs (Frenk & Moon, 2013; Kickbusch & Gleicher, 2012).
3. Research and Development: This includes funding for medical research, development of new drugs and technologies, and clinical trials (OECD, 2022; Scannell et al., 2012).
4. Administrative Costs: This covers the expenses incurred in managing healthcare systems, including insurance administration, billing, and regulatory compliance (Cutler & Ly, 2011; Reinhardt, 2013).

1.10.2 Factors Influencing Healthcare Expenditure

The factors which influences the healthcare expenditures are given as:

1. Demographics: Population aging, increasing life expectancy, and rising birth rates can lead to higher healthcare costs (Bloom et al., 2015; Newhouse, 1992).
2. Disease Prevalence: The prevalence of chronic diseases and infectious diseases can significantly impact healthcare spending (Dieleman et al., 2016; Nolte & McKee, 2008).
3. Technological Advancements: New medical technologies and treatments, while often beneficial, can be expensive and contribute to increased healthcare costs (Chandra & Skinner, 2012; Ginsburg, 2004).
4. Economic Factors: Economic growth and income levels can influence healthcare spending, with individuals and governments spending more on healthcare during periods of economic prosperity (Baltagi & Moscone, 2010; Newhouse, 1977).
5. Healthcare Policies: Government policies, such as insurance regulations and drug pricing controls, can significantly impact healthcare spending (Cutler, 2002; Geden & Zenker, 2022).

Understanding the components and factors influencing healthcare expenditure is crucial for policymakers, healthcare providers, and researchers to develop effective strategies for managing and optimizing healthcare costs (Getzen, 2013; Murthy & Okunade, 2009).

The measurement and analysis of healthcare expenditure is a crucial aspect of understanding the financial resources allocated to healthcare goods and services (Newhouse, 1992; Cylus et al., 2016). This process involves several vital steps and considerations:

1.10.3 Measurement and Analysis of Healthcare Expenditure

The healthcare expenditure could be measured systematically using the given steps:

1. Data Gathering: Relevant data on healthcare expenditures must be collected from governmental agencies, insurance firms, healthcare providers, and research institutions (Culyer, 1989; Magnussen et al., 2009).
2. Expenditure Categorization: Healthcare expenditures can be classified into distinct components, such as hospital care, physician services, prescription drugs, medical equipment, administrative expenses, and long-term care, to aid in understanding the allocation of healthcare funds (Morrisey, 2014; Murthy & Okunade, 2009).
3. Cost Examination: The analysis of costs involves examining the factors influencing healthcare expenditures and comprehending the drivers of cost escalation, including healthcare utilization patterns, demographic shifts, technological advancements, policy changes, and pricing structures (Chandra & Skinner, 2012; Newhouse, 1992).
4. Benchmarking and Comparison: Healthcare expenditures can be benchmarked and compared across geographical regions, healthcare systems, payer types, and time frames to identify disparities and potential areas for improvement (Getzen, 2013; OECD, 2021).
5. Economic Assessment: Economic evaluation methodologies, such as cost-effectiveness analysis, cost-benefit analysis, and cost-utility analysis, are employed to assess the value of healthcare expenditures concerning the health outcomes achieved (Drummond et al., 2015; Weinstein et al., 1996).
6. Policy Evaluation: The analysis of healthcare expenditures informs the evaluation of healthcare policies and reforms aimed at curbing costs, broadening access to care, and enhancing quality (Cutler, 2002; Geden & Zenker, 2022).
7. Forecasting and Projections: Forecasting models leverage historical data, demographic trends, epidemiological factors, and economic indicators to project future healthcare spending levels and trends (Newhouse, 1977; Rosen & Cutler, 2009).
8. Data Integrity and Transparency: Ensuring data integrity and transparency is crucial for accurate measurement and analysis of healthcare expenditures (Cylus et al., 2016; Papanicolas et al., 2019).
9. Stakeholder Engagement: Engaging stakeholders is essential for interpreting and applying insights derived from healthcare expenditure analysis (Frenk & Moon, 2013; Kickbusch & Gleicher, 2012).

These systematic approaches to measuring and analysing healthcare expenditures provide valuable insights to support evidence-based decision-making in healthcare policy and management.

1.10.4 Some Essential Aspects Regarding Global Healthcare Expenditure

Global healthcare expenditure represents a significant share of the world's economic activity, with countries investing substantial resources to meet the healthcare needs of their populations (Gerdtham & Jönsson, 2000; Murthy & Okunade, 2009). However, there exists wide variation in healthcare expenditure across different regions globally, with high-income countries generally allocating more per capita to healthcare compared to low- and middle-income countries (Anderson et al., 2019; Newhouse, 1977). Numerous factors influence global healthcare expenditure, including population demographics, epidemiological trends, healthcare infrastructure, technological advancements, healthcare policies, insurance coverage, and socioeconomic conditions (Chandra & Skinner, 2012; Newhouse, 1992).

Healthcare expenditure stems from both public and private sources, with governments in many countries playing a substantial role in healthcare financing through public health insurance schemes, taxation, and direct spending, while private spending encompasses out-of-pocket payments, private health insurance premiums, and employer-provided healthcare benefits (Cutler, 2002; Getzen, 2013). The configuration and efficiency of healthcare systems also play a pivotal role in shaping healthcare expenditure, as nations with universal healthcare coverage and robust primary care systems may distribute resources differently compared to those with fragmented healthcare systems or extensive healthcare privatization (Frenk & Moon, 2013; Kickbusch & Gleicher, 2012).

While higher healthcare expenditure does not always equate directly to improved health outcomes, adequate healthcare funding is crucial for enhancing access to healthcare services, reducing morbidity and mortality rates, and advancing population health (Cylus et al., 2016; Nolte & McKee, 2008). Healthcare expenditure is projected to continue its upward trajectory globally due to factors such as population aging, the increasing prevalence of chronic diseases, advances in medical technology, and rising healthcare demand, posing a critical challenge for policymakers to ensure the sustainability of healthcare financing worldwide (Newhouse, 1977; Rosen & Cutler, 2009).

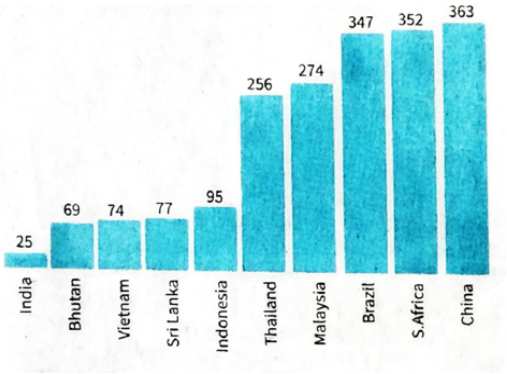


Figure 1.2: *India's Per Capita Public Spending on Health with Other Countries (2021) (in $PPP)* ***Source:*** *The Hindu, 15th May 2024*

1.10.5 Policy Implications of Healthcare Expenditure

Understanding healthcare expenditure trends and drivers is crucial for policymakers to develop effective interventions and strategies for controlling costs while ensuring access to quality healthcare for all citizens (Getzen, 2013; Murthy & Okunade, 2009). This may involve measures like promoting preventive care and healthy lifestyles to reduce the burden of chronic diseases (Nolte & McKee, 2008), negotiating drug prices and exploring alternative treatment options (Chandra & Skinner, 2012), optimizing resource allocation within healthcare systems (Kickbusch & Gleicher, 2012), expanding health insurance coverage and reducing out-of pocket expenses (Cutler, 2002; Frenk & Moon, 2013), and investing in research and development of cost-effective healthcare technologies (OECD, 2022; Scannell et al., 2012). Healthcare expenditure plays a critical role in ensuring access to quality healthcare for all, and understanding its components, influencing factors, and trends is essential for policymakers, healthcare providers, and individuals to make informed decisions and promote sustainable healthcare systems (Cylus et al., 2016; Newhouse, 1992). By addressing the challenges and opportunities associated with healthcare spending, we can strive towards a future where everyone has access to the care they need without undue financial burden.

1.11 Universal Health Coverage

The provision of universal health coverage is a crucial policy goal, and health insurance is an effective tool to achieve this objective (Kimball et al., 2013; Savedoff, 2012). Health insurance can enhance access to healthcare services and provide financial protection against the high costs associated with severe illness or hospitalization, which is particularly important for households in the informal economy (Fonseca & Dalal, 2014; Wagstaff et al., 2009). By combining social protection and financial access, health insurance can improve the ability of individuals to cope with the financial burden of healthcare expenses (Fonseca & Dalal, 2014; Gruber, 2008).

However, health insurance schemes can also face challenges related to adverse selection and moral hazard, which can lead to excessive consumption of healthcare services and higher outof-pocket (OOP) expenditures (Nair, 2016; Dror & Vellakal, 2012; Wang et al., 2006; Pauly, 1968; Arrow, 1963). Adverse selection occurs when individuals with higher healthcare needs are more likely to enroll in insurance plans, while moral hazard arises when insured individuals use medical services more frequently or access more expensive services than they would have otherwise (Nair, 2016; Dror & Vellakal, 2012; Pauly, 1968). On the supply side, moral hazard can also occur when healthcare providers seek financial gains by prescribing costly medical procedures, unnecessary surgical interventions, excessive use of diagnostic tests, and prolonged hospital stays (Sengupta & Rooj, 2017; Chandra & Skinner, 2012). These issues can

lead to a rise in healthcare costs and higher OOP expenditures for the uninsured, which is undesirable from a social efficiency perspective (Nair, 2016; Dror & Vellakal, 2012; Wang et al., 2006; Pauly, 1968).

Various studies have examined the impact of health insurance schemes in the Indian context, with mixed results. Some have found positive effects on healthcare access, OOP costs, and catastrophic health expenditure (CHE) (Agarwal, 2010; Devadasan et al., 2007; Raza et al., 2016; Karan et al., 2017). For example, an analysis of the Yeshasvini Health Insurance Scheme in Karnataka suggested that the initiative was successful in reducing OOP costs and improving the likelihood of achieving better health and economic outcomes (Agarwal, 2010). Additionally, the study by Devadasan et al. (2007) on the performance of two community based health insurance (CBHI) schemes in Karnataka, ACCORD and SEWA, found that although there was some level of financial risk protection for members, the level of protection was somewhat limited.

However, other studies have reported limited or partial achievement of the intended goals of health insurance programs (Selvaraj & Karan, 2012; Rathi et al., 2012; Devadasan et al., 2013; Rao et al., 2012; Karan et al., 2017). A study on the Rajiv Aarogyasri Community Health Insurance Scheme in Andhra Pradesh and Tamil Nadu reported minimal effectiveness in protecting beneficiaries against financial risks (Selvaraj & Karan, 2012). Similarly, families enrolled in the Rashtriya Swasthya Bima Yojana (RSBY) program in Maharashtra and Gujarat continued to have significant OOP expenses, especially for medications and diagnostics, despite the program being free of charge (Rathi et al., 2012; Devadasan et al., 2013).

The differences in findings across various studies may be attributed to variations in program design, implementation, and the specific contexts in which they operate (Vellakkal & Ebrahim, 2013; Dror et al., 2016). For instance, the study by Katyal et al. (2015) conducted a differential analysis of household survey data in Maharashtra and Andhra Pradesh and found that while average inpatient medical expenditure increased in both states, the length of hospital stays increased in Maharashtra but declined in Andhra Pradesh, coinciding with increased use of public hospitals in Maharashtra and their decline in Andhra Pradesh. These context-specific factors can significantly influence the effectiveness of health insurance schemes and their impact on OOP expenditure and financial protection (Vellakkal & Ebrahim, 2013; Dror et al., 2016).

The generalizability of the results is limited, and a case-specific approach is often required to understand the impact of health insurance programs (Vellakkal & Ebrahim, 2013; Dror et al., 2016). The existing literature on the impact of insurance on OOP costs emphasizes that the evidence is inconclusive and case-specific, highlighting the need for a more nuanced

understanding of the factors that contribute to the success or failure of these schemes (Vellakkal & Ebrahim, 2013; Dror et al., 2016).

The Pradhan Mantri Jan Aarogya Yojana (PMJAY), a flagship health insurance scheme launched by the Government of India in 2018, aims to provide universal health coverage to the poor and vulnerable populations (Forgia & Nagpal, 2012; Reddy et al., 2011). PMJAY employs various public-private partnership (PPP) models, such as trust-based, insurance-based, and hybrid approaches, to leverage the strengths and expertise of both the public and private sectors in delivering quality and affordable healthcare (Forgia & Nagpal, 2012; Prinja et al., 2017). These PPP models aim to promote innovation, efficiency, and accountability in the health care delivery system (Forgia & Nagpal, 2012; Prinja et al., 2017).

The high burden of OOP expenditure remains a significant challenge in the Indian healthcare system, with nearly 32 to 39 million people being pushed into poverty each year due to medical expenses (Shrime et al., 2015; Chagani, 2011; Sun et al., 2015; van Doorslaer et al., 2015; Berman et al., 2010). This issue is further exacerbated by the increasing income inequality and the gradual decline in the rate of poverty reduction since the 1980s (Pal & Ghosh, 2007; Dev, 2016; Deaton, 2005; Alkire & Seth, 2013). Households often have no choice but to pay OOP to access healthcare, leading to a chain of events where they fall below the poverty line and remain there as they prioritize medical expenses over meeting their basic needs (Kumar et al., 2015; Berman et al., 2010).

The evolution of India's health sector has been marked by a reduced role of the state in providing and delivering healthcare services, leading to the introduction of user fees in public hospitals during the Eighth Five Year Plan (1992-97) (Sen et al., 2002; Ghosh, 2014; Berman et al., 1997). This shift towards a greater reliance on user fees has had significant implications for the accessibility and affordability of healthcare, particularly for the poor, as the scope of support for this population remains limited (Thakur et al., 2009; Bhatia & Cleland, 2001). The debate on the poverty line in India is frequently revisited, and the actual support for the poor remains unclear, further exacerbating the challenges faced by the vulnerable sections of the population in accessing affordable healthcare (Panagariya & Mukim, 2013; Thakur et al., 2009).

In summary, the effective implementation of health insurance schemes, such as PMJAY, and the comprehensive understanding of their impact on OOP expenditure and financial protection, are crucial in addressing the challenges faced by the Indian healthcare system and ensuring equitable access to quality healthcare for all. The mixed results observed in the existing literature highlight the need for a more nuanced and context-specific approach to evaluating the performance of these programs, considering the various factors that can

influence their effectiveness in reducing the financial burden on households and improving healthcare outcomes.

1.12 Various other Healthcare Measures Undertaken by the Government of India for Improving the Quality of Care

The Government of India has taken several measures to improve the quality of healthcare in the country. These initiatives encompass both curative and preventive aspects of healthcare. Curative healthcare focuses on treating and managing existing illnesses or injuries, while preventive healthcare aims to prevent the occurrence of diseases and promote overall wellbeing. One of the significant steps taken by the government is the implementation of the National Health Mission (NHM). The NHM comprises two sub-missions: the National Rural Health Mission (NRHM) and the National Urban Health Mission (NUHM). These missions aim to strengthen healthcare infrastructure, increase access to quality healthcare services, and reduce out-of-pocket expenditure for citizens, particularly in rural and urban areas.

The government has also launched various programs to address specific health concerns. For instance, the Pradhan Mantri Jan Arogya Yojana (PM-JAY) under the Ayushman Bharat scheme provides health insurance coverage to economically vulnerable families, ensuring access to secondary and tertiary care services. Additionally, the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) program focuses on improving maternal and child health outcomes.

In terms of preventive healthcare, the government has implemented several measures such as the Universal Immunization Programme (UIP), which aims to protect children against vaccine preventable diseases. The Swachh Bharat Abhiyan, a nationwide cleanliness campaign, focuses on improving sanitation and hygiene practices to prevent the spread of communicable diseases.

Moreover, the government has recognized the importance of traditional Indian practices like yoga in promoting preventive healthcare. Yoga, an ancient practice that combines physical postures, breathing techniques, and meditation, has gained global recognition for its health benefits. The Government of India has taken steps to promote yoga, such as establishing the Ministry of AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha, and Homoeopathy) and celebrating International Yoga Day on June 21st every year. Yoga has been found to improve flexibility, strength, balance, and overall well-being, making it an effective tool for preventive healthcare.

Therefore the Government of India has undertaken various measures to improve the quality of healthcare in the country, addressing both curative and preventive aspects. While curative healthcare focuses on treating existing illnesses, preventive healthcare aims to prevent

the occurrence of diseases through initiatives like immunization programs, sanitation campaigns, and the promotion of yoga. These efforts collectively aim to enhance the overall health and well-being of the population.

1.12.1 Benefits of Yoga on Physical and Mental Health

Yoga is an ancient practice originating in India that combines physical postures, breathing techniques, and meditation to promote overall health and well-being. Regular yoga practice offers numerous physical and mental health benefits for people of all ages.

i. Improves strength, balance and flexibility: Yoga postures help build muscle strength, improve balance, and increase flexibility.
ii. Reduces stress and inflammation: Yoga may reduce levels of stress and body-wide inflammation, contributing to healthier hearts and helping address risk factors like high blood pressure and excess weight.
iii. Improves lung function: Yoga training significantly improves lung functions and strength of inspiratory and expiratory muscles.
iv. Helps manage chronic conditions: Yoga can be an integral part of treatment for chronic conditions like heart disease, diabetes, and sciatica, potentially hastening healing. For example, yoga asanas and pranayama helped decrease blood glucose levels in type 2 diabetes patients in India.
v. Improves mental well-being: Yoga has been found to have substantial beneficial effects on anxiety symptoms and may provide small additional benefits for depression when used with other treatments. It also promotes mental well-being by increasing self-esteem and enabling better sleep.

As participation in yoga programs continues to increase, it's important for healthcare professionals to be informed about its therapeutic effects, which have been studied in various populations for different conditions.

1.12.2 Healthcare Programs in India Promoting Yoga

The Indian government recognizes the health benefits of yoga and has implemented several initiatives to promote its practice among citizens:

i. International Day of Yoga: In 2015, the United Nations declared June 21 as the International Day of Yoga after a call from Indian Prime Minister Narendra Modi. This has significantly boosted awareness and participation in yoga in India and worldwide.

ii. AYUSH Ministry: The Indian government established the Ministry of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) in 2014 to promote traditional Indian healing practices, including yoga. The ministry supports research, education and integration of yoga into modern healthcare.

iii. Yoga Certification Board: Established by the AYUSH Ministry, the Yoga Certification Board aims to standardize yoga training and certify yoga professionals and institutions to ensure quality and safety.

iv. Yoga in School Curriculum: Many Indian states have introduced yoga as part of the physical education curriculum in schools to promote its practice from a young age.

v. Yoga Therapy in Hospitals: Some major government hospitals in India, like AIIMS Delhi, have integrated yoga therapy into their treatment protocols, especially for chronic diseases and mental health conditions.

However, challenges remain in making yoga accessible to all Indians, such as the cost of classes and lack of customized referrals from healthcare providers. Developing evidence-based prescription guidelines and offering yoga at minimal cost through health insurance could enable greater integration into regular healthcare practices.

Therefore, the numerous health benefits of yoga are increasingly being validated by scientific research. The Indian government's efforts to promote yoga through education, standardization and integration into healthcare are commendable, and could serve as a model for other countries looking to leverage this ancient practice for the well-being of their citizens.

1.12.3 Healthcare Programmes For Enhanced Quality of Care

The Government of India has implemented several healthcare programmes aimed at enhancing the quality of care and improving health outcomes for the population. These initiatives encompass both preventive and curative aspects of healthcare, with a focus on expanding access, strengthening infrastructure, and promoting evidence-based practices. Some key programmes include:

1. National Health Mission (NHM): The National Health Mission, launched in 2013, is an overarching program that subsumes the National Rural Health Mission (NRHM) and the National Urban Health Mission (NUHM). It aims to provide universal access to equitable, affordable and quality healthcare services that are accountable and responsive to people's needs . Major initiatives under NHM include:
    a. Strengthening health infrastructure and human resources in rural areas
    b. Promoting community participation and ownership

    c. Integrating vertical health programs
    d. Leveraging information technology for better monitoring and evaluation
2. Pradhan Mantri Swasthya Suraksha Yojana (PMSSY): Launched in 2006, PMSSY aims to correct regional imbalances in the availability of affordable tertiary healthcare services and augment facilities for quality medical education. Key components include:
    a. Setting up of AIIMS-like institutions
    b. Upgrading existing government medical colleges
    c. Strengthening of state government hospitals
3. Ayushman Bharat: Ayushman Bharat, launched in 2018, is an ambitious program aimed at making interventions to address health holistically through two components:
    a. Health and Wellness Centres (HWCs): Upgrading 150,000 sub-centres and primary health centres to provide comprehensive primary care, including for non-communicable diseases and mental health.
    b. Pradhan Mantri Jan Arogya Yojana (PM-JAY): Providing health insurance coverage of up to INR 5 lakhs per family per year for secondary and tertiary care hospitalization to over 10 crore poor and vulnerable families.
4. National Disease Control Programs: India runs several national programs to address communicable and non-communicable diseases. Some key programs include:
    a. National AIDS Control Program: Provides leadership to HIV/AIDS control through prevention, care, support and treatment services.
    b. Revised National Tuberculosis Control Program: Provides free quality tuberculosis diagnosis and treatment services across the country.
    c. National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke: Focuses on health promotion, early diagnosis, management and referral of cases, and building capacity.
5. Quality Assurance Initiatives: Several initiatives have been undertaken to improve the quality of healthcare services:
    a. National Quality Assurance Standards: Developed to improve quality of care at public health facilities and enable their certification.
    b. LaQshya Program: Aims to improve quality of care in labour rooms and maternity operation theatres in public health facilities.
    c. Kayakalp Initiative: Focuses on promoting cleanliness, hygiene and infection control practices in public healthcare facilities.

In conclusion, the Government of India has undertaken various measures to improve healthcare quality through national programmes and initiatives. While significant progress has been made in expanding access and infrastructure, challenges remain in ensuring consistent quality of care across all regions and populations. Continued efforts are needed to strengthen implementation, enhance monitoring and evaluation, and address systemic issues to achieve sustainable improvements in healthcare quality nationwide.

1.12.4 Challenges and Way Forward

Despite these initiatives, challenges remain in ensuring access to quality healthcare for all Indians. These include inadequate public health expenditure, shortage of trained healthcare workforce, lack of accountability, and unregulated private sector.

The way forward lies in increasing government health spending, developing a comprehensive primary healthcare system, regulating the private sector, leveraging technology, and promoting community participation. A holistic, patient-centric approach with concerted efforts from all stakeholders is needed to transform India's healthcare landscape.

1.13 Motivation of the Study

The motivation for this study stems from several key factors related to healthcare delivery in Jharkhand:

1. Addressing the significant challenges faced by Jharkhand in providing accessible and quality healthcare services to its population, particularly in rural and remote areas. The state has a lower density of healthcare facilities and qualified healthcare professionals compared to the national average, leading to inequalities in healthcare access and outcomes.
2. Assessing the progress made by Jharkhand in recent years in improving the availability and accessibility of healthcare services through expanding healthcare infrastructure, training and recruiting healthcare workers, implementing public health programs, and collaborating with non-governmental organizations. Despite these improvements, the state still faces challenges in ensuring equitable access to quality healthcare services.
3. Examining the potential role of Public-Private Partnerships (PPPs) in addressing the challenges faced by the healthcare sector in Jharkhand. PPPs involve collaboration between the public and private sectors to finance, design, build, and operate healthcare facilities and services. The study aims to investigate the quality differential in healthcare services provided through PPPs compared to traditional public sector delivery.
4. Contributing to the ongoing debate on the role of PPPs in healthcare delivery and the factors that influence the quality of services provided through this model. As healthcare

systems continue to face resource constraints and increasing demand, understanding the potential benefits and limitations of PPPs is crucial for policymakers and practitioners seeking to improve the accessibility and quality of healthcare services.

In summary, the motivation for the study stems from the need to address the healthcare challenges in Jharkhand, assess the progress made so far, explore the potential of PPPs in improving healthcare delivery, and contribute to the evidence base on the quality of healthcare services provided through different models. The findings of the study can inform healthcare policy and practice, helping decision-makers optimize resource allocation and improve patient care in resource-constrained settings like Jharkhand.

1.14 Relevance of the Topic

The topic of assessing quality differentials between public and private healthcare facilities under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme in Jharkhand, India is highly relevant for several reasons:

1. Addressing healthcare inequities: Investigating quality differences between public and private hospitals can shed light on potential disparities in healthcare access and outcomes for different segments of the population. This is crucial for designing policies to ensure equitable, high-quality care for all under AB-PMJAY.
2. Informing policy decisions: The study's findings on factors influencing perceived quality, such as competition and hospital ownership, provide valuable insights for policymakers to optimize the implementation of AB-PMJAY. This evidence can guide decisions on resource allocation, provider contracting, and quality improvement initiatives.
3. Strengthening universal health coverage: As AB-PMJAY aims to provide comprehensive health coverage to vulnerable populations, ensuring quality of care across participating facilities is essential. Understanding quality differentials can help identify areas for improvement and inform strategies to strengthen the scheme's impact on population health.
4. Promoting public-private partnerships: The study explores the potential of public private partnerships (PPPs) to improve healthcare access and quality in underserved areas. Insights on the performance of PPPs can guide efforts to effectively leverage private sector expertise and resources to enhance AB-PMJAY's reach and outcomes.
5. Advancing health system performance: By examining healthcare availability, accessibility, affordability, and quality in Jharkhand, the study offers a comprehensive assessment of health system performance under AB-PMJAY. This can inform targeted interventions to address systemic challenges and optimize the scheme's impact.

6. Contributing to evidence-based policymaking: The study addresses critical gaps in the literature on quality of care under publicly-funded health insurance schemes in resource-constrained settings. The findings contribute to the evidence base for data driven policymaking and can guide future research on healthcare quality in India and beyond.

Therefore, this study's focus on quality differentials between public and private healthcare facilities under AB-PMJAY in Jharkhand is highly relevant for advancing equitable access to quality healthcare, informing policy decisions, strengthening universal health coverage efforts, and promoting evidence-based policymaking in India's journey towards achieving health for all.

1.15 Scope of the Study

This study aims to provide a comprehensive understanding of the healthcare landscape within the selected hospitals in the Ranchi District. The research design encompasses several key objectives and considerations:

1. Examining Demographic Characteristics: The study will analyze the demographic profiles of patients and hospital staff within the selected institutions.
2. Analysing Healthcare Services: The study focuses on identifying the types of healthcare services provided by the selected hospitals, with the goal of contributing to the enhancement of healthcare delivery.
3. Comparing Stakeholder Experiences: The study will undertake a comparative analysis of the experiences and perspectives of patients and hospital staff within the selected institutions.
4. Identifying Challenges to Healthcare Access: The study seeks to uncover potential challenges or barriers to accessing healthcare services within the selected hospitals.

In summary, the scope of this study encompasses a comprehensive examination of the healthcare landscape within selected hospitals in the Ranchi District of Jharkhand. By focusing on these key areas, the study seeks to provide valuable insights that can contribute to enhancing healthcare delivery and accessibility in the region. The findings from this focused analysis of Ranchi District hospitals will offer a detailed snapshot of the current healthcare situation, potentially informing policy decisions and improvement initiatives for healthcare services in Jharkhand.

1.16 Limitations of the Study

This study collected data from a sample size of 437 patients and 339 hospital staff and caregivers in the Ranchi District of Jharkhand. The process of collecting data was challenging

due to privacy concerns and hospital policies, but most participants were cooperative. The data was collected from PM-JAY enrolled private and public hospitals selected through purposive random sampling, excluding teaching hospitals, disease-specific hospitals, and medical colleges. The study was conducted over a period of 6-8 months without any funding. Data was primarily collected from outpatients to respect the privacy and comfort of inpatients.

1.17 Organization of the Study

Chapter 2 of the study provides a comprehensive review of the existing literature on healthcare delivery, public-private partnership in healthcare, healthcare management, and quality of care. It examines the scope of healthcare delivery issues, including challenges and complexities related to access to care, healthcare disparities, and the role of technology. The chapter also explores the concept of public-private partnership in healthcare, different models of collaboration, and its implications. In addition, it analyses the role of healthcare management in improving patient outcomes and highlights the importance of quality of care in healthcare delivery.

Chapter 3 focuses on the methodology and data sources used in the research. It explains the research design, whether qualitative, quantitative, or a combination, and justifies its suitability. The chapter discusses the sampling strategy, sample size determination, and selection criteria to ensure representativeness. It also describes the data collection methods, including primary sources like surveys and interviews, and secondary sources like literature reviews and existing datasets. Ethical considerations and participant privacy protection measures are addressed. The chapter further explains the data analysis techniques employed and measures taken to ensure study reliability and validity.

Chapter 4 presents the results and analysis of data collected from primary and secondary sources. It provides a summary of the demographic characteristics of the study participants and analyses data from surveys, interviews, observations, and experiments. The chapter identifies patterns and trends related to healthcare delivery, public-private partnership, and quality of care. Statistical analysis may be included depending on the research design. The findings from secondary data sources are also presented. The chapter concludes with a summary of key findings and their implications for the study.

Chapter 5 focuses on conclusions, including the interpretation of the study's findings, policy implications, limitations, and suggestions for further research.

1.18 Summary

This chapter explores the intricate connection between health and economic development. It commences by defining health not solely as the absence of disease but as a state encompassing complete physical, mental, and social well-being. This holistic definition underscores the

pivotal role of health in enabling individuals to achieve their full potential and contribute effectively to economic growth. The chapter underscores the substantial impact of health on economic productivity. It highlights the indirect benefits of good health on development, such as increased rates of school enrolment and enhanced levels of educational attainment.

In essence, the chapter underscores the crucial role of health in propelling economic growth and development. It emphasizes the necessity for robust health infrastructure, both in terms of quantity and quality, to deliver accessible and affordable healthcare services to all individuals. By prioritizing health as a public good and investing in public health initiatives, countries can lay the groundwork for sustainable development and enhanced well-being for their populations.

CHAPTER II
REVIEW OF LITERATURE

Chapter 2 | REVIEW OF LITERATURE

2.1 Introduction

The literature review presented in this chapter delves into a comprehensive analysis of various healthcare topics. This review aims to provide valuable insights and critical analysis of key developments in the healthcare sector, shedding light on the challenges and opportunities that shape the delivery of healthcare services worldwide. Through an exploration of recent research and scholarly works, this chapter seeks to offer a deeper understanding of the evolving landscape of healthcare delivery and the innovative approaches being adopted to address pressing healthcare needs. It also includes study on global trends in team-based care, the impact of the COVID-19 pandemic, advances in healthcare technology such as AI, and the utilization of Health Technology Assessment to enhance access to essential medicines.

2.2 Theoretical Framework

The theoretical framework for this study draws upon several key economic and healthcare theories to analyze the quality differential in healthcare delivery through public-private partnerships. This section outlines the relevant theories that provide the conceptual foundation for examining healthcare quality, resource allocation, and the interplay between public and private sectors in healthcare provision. The theoretical framework helps guide the research questions, methodology, and interpretation of findings related to quality differentials in healthcare delivery

1. Kaldor-Pasinetti Theory of Distribution [Cambridge Growth Model]
    a. The most remarkable results of Kaldor-Pasinetti approach to growth and income distribution are known as Cambridge Theorem.
    b. It states that the rate of profit in an economy on the long period growth path is the ratio of the natural rate of growth to pure capitalists' propensity to save.
    c. In an economy with institutional investors, investment and hence growth are likely to be influenced by the decisions of such investors. But under modern capitalism there are many high technology firms which present institutional investors with substantially greater problems of risk and asymmetric information than firms with less dynamic technologies. It is therefore reasonable to assume a correlation between technological level and the degree to which accumulation is financed from retained profits.
    d. Private Sector is motivated by the returns on capital and hence will not invest in the public goods like healthcare.
2. Utility Theory of Value

a. The theory attempts to explain the exchange value or price of goods and services.
b. Key questions it tries to address are:
    i. Why goods and services are priced as they are?
    ii. How the value of goods and services comes about? And
    iii. How to calculate the correct price of goods and services (if such a value exists)?
c. This explains the price/cost of providing social goods such as healthcare.

3. Pareto Optimality Principle
    a. Pareto Efficiency is a situation where no individual or preference criterion can be made better off without making at least one individual or preference criterion worse-off.
    b. Market success is defined as the ability of a set of idealized competitive markets to achieve an equilibrium allocation of resources that is Pareto optimal in terms of resource allocation.
    c. Market failure is defined as an inefficient allocation of resources; it implies Pareto Inefficiency.

4. Health Production Function Model: This model examines the relationship between healthcare inputs (such as healthcare expenditure, number of healthcare providers, etc.) and health outcomes. It could be used to analyse the efficiency and effectiveness of healthcare spending and interventions in improving population health.
5. Grossman Model of Health Demand: This model views health as a durable capital stock that produces an output of healthy time. It could be applied to understand how individuals make decisions about investing in their health through healthcare utilization and lifestyle choices, and how this affects health outcomes and healthcare costs.
6. Principal-Agent Model: This model is relevant in the context of healthcare providers (agents) acting on behalf of patients (principals). It could be used to examine issues such as information asymmetry, provider incentives, and how these factors influence healthcare quality and costs.
7. Bounded Rationality: This concept, introduced by Herbert A. Simon, suggests that when individuals make decisions, their rationality is limited by the available information, cognitive limitations, and time constraints. In the context of healthcare, this could explain why patients may not always choose the most cost-effective or quality-optimal healthcare options.

8. Social Norms: People's behavior is often influenced by what they perceive as normal or acceptable within their social context. Leveraging social norms could be effective in promoting healthy behaviours or encouraging the utilization of healthcare services.

This theoretical framework provides a foundation for examining quality differentials in healthcare delivery through public-private partnerships. By drawing on economic theories like the Kaldor-Pasinetti model, utility theory of value, and Pareto optimality principle, as well as healthcare-specific models like the health production function and Grossman model, we can analyze the complex interplay of factors influencing healthcare quality and access. Concepts like bounded rationality and social norms offer insights into decision-making processes of both providers and patients. This multi-faceted theoretical approach allows for a comprehensive examination of the research questions, considering economic, social, and behavioural aspects of healthcare delivery and utilization.

2.3 Public Private Partnership in Healthcare Delivery

Public-private partnerships (PPPs) have emerged as a promising approach to address the challenges of healthcare delivery in many countries, particularly in developing nations. PPPs in healthcare involve collaboration between government entities and private sector organizations to finance, design, build, and operate healthcare facilities and services (Roehrich et al., 2014). The primary objective of healthcare PPPs is to leverage the strengths of both the public and private sectors to improve access to quality healthcare services while optimizing resource utilization and efficiency (Torchia et al., 2015). However, the impact of PPPs on healthcare quality remains a topic of debate and concern. Quality differentials in healthcare delivery through PPPs can arise due to various factors, such as differences in the quality of infrastructure, equipment, and human resources; variations in clinical processes and outcomes; and disparities in patient satisfaction and experience (Montagu & Harding, 2012).

Several studies highlighted the differences in the quality of infrastructure and equipment between public and private healthcare facilities operating under PPP arrangements. Alonso et al. (2015) found that private hospitals participating in PPPs in Brazil had significantly better infrastructure and equipment compared to public hospitals, which contributed to higher patient satisfaction and better clinical outcomes. Similarly, Rao et al. (2018) reported that private hospitals in PPPs in India had more advanced diagnostic and treatment facilities, leading to improved access to specialized care for patients. However, some studies also noted that the quality of infrastructure and equipment in PPP facilities varied depending on the specific arrangement and the level of government oversight. Muhammed et al. (2017) conducted a case study in Nigeria and found that some PPP hospitals lacked basic amenities such as clean water

and reliable electricity supply, which negatively impacted the quality of care provided. These findings suggest that the quality of infrastructure and equipment in healthcare PPPs is not always uniform and can be influenced by factors such as the specific terms of the partnership, the level of government involvement, and the local context (Whyle & Olivier, 2016).

The availability and caliber of human resources in healthcare PPPs were found to be important determinants of care quality. A cross-sectional study comparing the job satisfaction and retention of healthcare personnel in public and private hospitals under PPP arrangements was carried out in China by Chen et al. (2020). Better working conditions, pay, and opportunities for professional growth were cited by the survey as the reasons why healthcare employees in private hospitals expressed more job satisfaction and fewer plans to leave. These results are in line with recent research that has shown how PPPs can draw in and keep qualified healthcare professionals (Ensor et al., 2017; Panda et al., 2020). In contrast, Singh et al. (2016) conducted a qualitative study in India and highlighted the challenges faced by healthcare workers in public hospitals participating in PPPs, such as high workload, limited resources, and lack of support from management. These factors were found to contribute to lower motivation and job satisfaction among healthcare workers, potentially impacting the quality of care provided. These findings underscore the importance of addressing the needs and concerns of healthcare workers in PPPs to ensure the delivery of high-quality care (Abuya et al., 2015; Hellowell et al., 2019).

Several studies examined the differences in clinical processes and outcomes between public and private healthcare facilities in PPPs. Montagu et al. (2016) conducted a systematic review analyzing the quality of care in private and public healthcare facilities in LMICs, including those operating under PPP arrangements. The review found that private facilities generally had better drug availability, responsiveness, and timeliness of care compared to public facilities. However, the review also noted that the quality of care varied widely across different types of private facilities and countries, highlighting the need for context-specific assessments of healthcare quality in PPPs. Aggarwal et al. (2019) compared the quality of maternal and child health services in public and private hospitals under PPP arrangements in India using a set of quality indicators. The study found that private hospitals performed better on indicators related to antenatal care, institutional deliveries, and postnatal care. However, public hospitals had better performance on indicators related to child immunization and growth monitoring. These findings suggest that the impact of PPPs on clinical processes and outcomes may vary depending on the specific area of healthcare and the indicators used to assess quality (Joudyian et al., 2021; Zaidi et al., 2017).

Patient satisfaction and experience are important indicators of healthcare quality, and several studies have examined these aspects in the context of healthcare PPPs. Abuya et al. (2018) conducted a cross-sectional survey in Kenya assessing patient satisfaction with healthcare services in public and private facilities under PPP arrangements. The study found that patients in private facilities reported higher satisfaction with the quality of care, staff attitudes, and waiting times compared to those in public facilities. These findings are consistent with other studies that have reported higher patient satisfaction in private healthcare facilities, including those operating under PPP arrangements (Basu et al., 2012; Tuan et al., 2020). Similarly, Aljunid et al. (2016) conducted a qualitative study in Malaysia exploring patient experiences and perceptions of healthcare quality in public and private hospitals under PPP arrangements. The study found that patients in private hospitals reported better communication with healthcare providers, more personalized care, and higher overall satisfaction with the healthcare experience. These findings highlight the potential of PPPs to improve patient centered care and enhance the overall healthcare experience (Khoja et al., 2017; Sekhri et al., 2011).

However, some studies also highlighted the challenges faced by patients in accessing healthcare services through PPPs, particularly in terms of affordability and equity. Thadani et al. (2020) examined the financial burden of healthcare on households in areas served by PPP hospitals in India. The study found that despite the availability of subsidized care through PPPs, many households still faced significant out-of-pocket expenditures and catastrophic health spending, particularly among lower-income groups. These findings underscore the need for PPPs to address issues of affordability and equity to ensure that the benefits of improved healthcare quality are accessible to all segments of the population (Barlow et al., 2013; Jacobs et al., 2012).

The literature review reveals a complex picture of quality differentials in healthcare delivery through PPPs. While some studies suggest that private healthcare facilities in PPPs generally perform better on indicators related to infrastructure, equipment, human resources, clinical processes, and patient satisfaction, others highlight the variability in quality across different contexts and arrangements (Alonso et al., 2015; Montagu et al., 2016; Rao et al., 2018).The findings underscore the importance of robust governance mechanisms, regulatory frameworks, and monitoring systems to ensure the quality and equity of healthcare services delivered through PPPs (Cashin et al., 2017; Raman & Björkman, 2019). Governments and policymakers need to establish clear quality standards, performance indicators, and accountability measures for private partners in PPPs to ensure that they deliver high-quality care while also addressing issues of access and affordability (Abdullah et al., 2019; Hellowell, 2019).Moreover, the review highlights the need for further research to better understand the

factors influencing quality differentials in healthcare PPPs and to identify best practices for designing and implementing PPP models that prioritize quality, equity, and sustainability (Roehrich et al., 2014; Whyle & Olivier, 2016). Future studies should employ rigorous methodologies, including prospective designs, comparative analyses, and mixed-methods approaches, to provide more conclusive evidence on the impact of PPPs on healthcare quality (Montagu & Harding, 2012; Torchia et al., 2015).

The impact of PPPs on healthcare quality varies across different contexts and arrangements, and challenges related to equity, access, and affordability persist (Barlow et al., 2013; Jacobs et al., 2012; Thadani et al., 2020).To maximize the benefits of healthcare PPPs and minimize quality differentials, governments and policymakers need to establish robust governance mechanisms, regulatory frameworks, and monitoring systems that ensure the quality, equity, and sustainability of healthcare services delivered through PPPs (Abdullah et al., 2019; Cashin et al., 2017; Hellowell, 2019; Raman & Björkman, 2019). By addressing these issues and leveraging the strengths of both the public and private sectors, healthcare PPPs can contribute to the achievement of universal health coverage and the Sustainable Development Goals, particularly in LMICs where access to quality healthcare remains a significant challenge (Ensor et al., 2017; Joudyian et al., 2021; Panda et al., 2020; Zaidi et al., 2017).

2.3.1 Public Private Partnership and Unmet Needs in Family Planning

Unmet needs in family planning remain a significant challenge in many developing countries, with far-reaching consequences for individuals, families, and societies. Public-private partnerships (PPPs) have emerged as a promising approach to address these unmet needs by leveraging the strengths of both the public and private sectors.

One of the key advantages of PPPs in family planning is their ability to expand access to services, particularly in underserved areas. A study by Thurston et al. (2015) found that a PPP in Uganda successfully increased access to family planning services in rural areas by training and supporting private healthcare providers. Similarly, a study by Bellows et al. (2017) demonstrated that a voucher program implemented through a PPP in Kenya increased the uptake of long-acting reversible contraceptives among low-income women.

PPPs can also improve the quality of family planning services by promoting evidence-based practices and ensuring adequate training and supervision of healthcare providers. A systematic review by Agarwal et al. (2019) found that PPPs in family planning generally led to improvements in service quality, including increased availability of contraceptive methods, better counselling and follow-up, and higher client satisfaction. However, the authors noted that the quality of evidence was mixed, highlighting the need for more rigorous evaluations of PPP interventions.

Another potential benefit of PPPs in family planning is their ability to reach marginalized and vulnerable populations who may face barriers to accessing services. A study by Chakraborty et al. (2019) examined a PPP in India that aimed to increase access to family planning services among urban slum dwellers. The study found that the PPP approach was effective in increasing awareness and utilization of family planning methods, particularly among younger women and those with lower levels of education.

Despite these promising findings, there are also challenges and limitations to the use of PPPs in addressing unmet needs in family planning. A review by Appleford and Rama Rao (2019) highlighted several key challenges, including ensuring the sustainability and scalability of PPP interventions, maintaining quality standards across diverse healthcare providers, and addressing issues of equity and affordability for the poorest and most marginalized populations. Furthermore, the effectiveness of PPPs in family planning may depend on the specific context and design of the intervention. A study by Shelton and Finkle (2016) emphasized the importance of tailoring PPP approaches to the local context, taking into account factors such as the existing health system infrastructure, the policy and regulatory environment, and the socio-cultural norms surrounding family planning.

In conclusion, recent studies suggest that PPPs have the potential to address unmet needs in family planning by expanding access to services, improving service quality, and reaching marginalized populations. However, the effectiveness of PPPs depends on various factors, including the design and implementation of the intervention, the local context, and the ability to address challenges related to sustainability, quality, and equity. As such, further research is needed to identify best practices and strategies for maximizing the impact of PPPs in addressing unmet needs in family planning, particularly in low- and middle-income countries where the need is greatest.

2.4 Quality of Care in Healthcare Systems

The concept of “Quality of Care” is a multifaceted one that encompasses various aspects of healthcare delivery, including technical performance, interpersonal aspects, patient contributions, and the impact of the healthcare system as a whole (Donabedian, 1988; Kruk et al., 2018). Defining quality in healthcare requires a balanced approach that takes into account the structure, process, and outcomes of care. It is important to note that higher spending on healthcare does not necessarily lead to better care, as there are diminishing returns on health benefits beyond a certain point (Papanicolas et al., 2019). Healthcare quality is a subjective, complex, and multi-dimensional concept, with over 100 identified attributes (Mosadeghrad, 2012; Nylenna et al., 2015). These attributes range from availability, accessibility, and acceptability to technical competence, timeliness, and patient satisfaction. It is important to

recognize that professional perspectives on quality care may differ from patient perspectives, especially when it comes to technical services and satisfaction (Prakash, 2022). Quality care is deeply embedded in social constructs and goes beyond clinical guidelines (Hanefeld et al., 2017; Okunrintemi et al., 2021). Assessing quality requires a comprehensive approach that incorporates factors such as trust, responsiveness, and cultural context. These factors play a crucial role in shaping patients' experiences and perceptions of the quality of care they receive.

Measuring and improving healthcare quality is a challenging task, as there is significant variability in the quality of care provided across different settings (Brook et al., 2000; Figueroa et al., 2019). One of the main challenges is the lack of a widely available public toolkit for quality assessment in non-research settings. Additionally, financial incentives have had a limited impact on quality improvements (Scott et al., 2018). To accurately assess care quality, it is important to collect data from patients and have access to medical records. There is also a need for standardized national reports on quality progress and advanced tools for quality assessment (Jha et al., 2021). According to Campbell et al. (2000) and Mossialos et al. (2022), there are two principal dimensions of quality of care for individual patients: access and effectiveness. The framework for understanding quality of care incorporates the interconnected roles of healthcare system structures, care processes, and patient outcomes. Quality of care is related to the structure of the health system, the processes of providing care, and the outcomes of care.

Patient satisfaction is a crucial measure of healthcare system quality (Senić & Marinković, 2012; Batbaatar et al., 2017). Factors such as strong doctor-patient relationships, timely delivery of services, and the physical aspects of facilities all impact patient satisfaction. Despite efforts to enhance patient safety and healthcare quality, progress has been slow (Chassin, 2013; Bates & Singh, 2018). There is a need for a rigorous overhaul in quality improvement efforts, addressing overuse, employing sophisticated tools, and transforming organizational culture. Quality improvement is crucial for enhancing service systems and processes using routine health and program data (Datta et al., 2018; Mate et al., 2021). In India, the formation of the Nationwide Quality of Care Network aims to implement quality improvement methods sustainably. However, there is significant variation in guideline compliance across different points of care in India, which affects the quality of care delivered (Vasan et al., 2020).

Monitoring quality is necessary to evaluate the value of healthcare expenditures (McGlynn, 1997; Kringos et al., 2020). Challenges in monitoring quality include balancing stakeholder perspectives, creating accountability, establishing evaluation criteria, selecting indicators, aligning incentives, and enhancing information systems. Public-private

collaboration is advocated to address these challenges effectively (Sharma et al., 2021). Indicators are specific measures that help determine healthcare system performance (Lawrence, Olesen, 1997; Noto et al., 2019). There is a distinction between target standards (intended quality) and achieved standards (actual quality delivered). When setting quality care standards, it is important to consider cost-benefit ratios and resource availability. Indicators should be selected carefully to truly reflect and improve healthcare quality in specific contexts.

There is a shortage of systematic evidence about the actual quality of care delivered in the United States (Schuster et al., 1998; Schuster et al., 2021). The absence of a mandatory national system to track healthcare quality leads to reliance on narratives and fear rather than facts. Issues of overuse, underuse, and misuse of medical care contribute to the quality gap. There is a substantial gap between the potential of the American healthcare system and the care currently provided (Shine, 2002; Schoen et al., 2021). Strategic and operational changes are needed to bridge the quality gap and enhance the standard of healthcare delivery. Healthcare quality in developing nations is often inconsistent and poor, with wide variations within regions (Mohanan et al., 2016; Kruk et al., 2018). However, high-quality care is achievable even with limited resources through improved care delivery processes. Policy interventions are needed to reorganize healthcare structures or directly affect provider behavior. The six domains of healthcare quality are safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity (Institute of Medicine, 2001; Nylenna et al., 2015).

India's healthcare sector exhibits an extreme range of quality, from globally acclaimed hospitals to facilities providing unacceptably low-quality care (Mohanan et al., 2016; Angell et al., 2019). The growing burden of chronic diseases increases the urgency for healthcare quality management. Lack of reliable data and technical difficulties in measuring quality hamper improvement efforts. Gaps between providers' knowledge and actual care provided suggest inefficiencies and potential for improvement. Systemic challenges such as lack of incentives, information issues, lack of accountability, and poorly functioning governance systems persist. Ongoing efforts aim to enhance data quality, develop better quality measures, and create innovative solutions (Mate et al., 2021). An innovative approach using standardized patients has been employed to evaluate primary care in public and private settings in India (Das et al., 2015). Private practitioners often provided more thorough care compared to their public sector counterparts. Increased effort in the private sector corresponds to higher costs and some unnecessary treatments. In the public sector, there is no clear correlation between pay and care quality, highlighting systemic issues. A comprehensive evaluation reveals that the average quality of primary health centers in India is substandard at 52% (Powell-Jackson et al., 2013). Significant regional disparities in quality of care exist, especially in low-performing states.

Good management practices are important for improving healthcare quality (Bloom et al., 2014).

There is an intertwined relationship between socio-economic development and health performance in India (Ramani & Mavalankar, 2006; Balarajan et al., 2011). Despite economic advancements, India faces substantial health challenges, including high mortality rates, the rise of non-communicable diseases, and the prevalence of HIV/AIDS. Urbanization, the growth of urban slums, and environmental health issues contribute to the health strain. The healthcare sector is under financial strain, with high out-of-pocket costs for the population. Significant reforms are needed at multiple levels of the health system. India faces a shortage of healthcare professionals, with only 0.7 doctors per 1000 population (Gopal, 2019; Rao et al., 2021). The country lags in health outcomes compared to some neighbouring countries, affected by issues such as over-prescription, unnecessary interventions, and inadequate regulation. Significant investment, improved quality standards, and efficient monitoring mechanisms are needed. The Indian government has taken initiatives such as prenatal care programs and national health insurance schemes (Rudrappa et al., 2018; Angell et al., 2019). However, challenges persist, such as rural-urban disparities, high out-of-pocket expenditures, and the absence of universal health coverage. Systemic healthcare reform is necessary to achieve Universal Health Care by 2020 (Reddy, K S et al., 2011; Patel et al., 2015).

India has witnessed a robust expansion of the private healthcare sector, predominantly urban centric with clinics, nursing homes, and specialized hospitals (Srinivisan, 2020; Mackintosh et al., 2016). The privatization of healthcare poses challenges in regulating quality, ensuring affordability, and maintaining accountability. There has been a shift toward acute, specialized care at the expense of accessible, general treatments, pricing them out of reach for the poor. High private out-of-pocket costs place a significant burden on households, exacerbating health inequities. There is concern regarding the quality of care in private practice due to the commodification of healthcare. Households bear high costs of medical care, with the private sector playing a significant role (Bhat, 1993; Baru, 2020). The weak public healthcare system and favourable government policies have been pivotal factors for the private sector's expansion (Rao, 2012; Sengupta et al., 2017). Government incentives and policy frameworks have led to significant investment, turning healthcare into a lucrative industry.

The growth of private hospitals has transformed Indian healthcare delivery (Agarwal & Ganesh, 2017; Baru & Nundy, 2020). Quality improvement programs, such as Total Quality Management, could enhance organization performance and patient satisfaction. A combination of quality improvement programs and increased use of ICT is necessary to speed up service delivery. The success of healthcare strategies depends on the healthcare institutions' ability to

implement them effectively (Agarwal & Ganesh, 2017; Sharma et al., 2021). Public-private provision of care refers to the coexistence and balance between publicly funded and delivered healthcare services and those offered by the private sector, which can be either for-profit or nonprofit entities (Peabody et al., 2006; Basu et al., 2012). In developing countries, private practitioners often provide a significant amount of healthcare. The right balance between public and private healthcare services can be contentious, but successful examples include initiatives where private provision has led to high-quality care due to effective public regulation and oversight. The balance aims to leverage strengths from both sectors to improve accessibility, quality, and efficiency of healthcare services. The public sector in healthcare aims to increase welfare through public services, while the private sector enhances the value of the resources. The private sector in healthcare has the potential to exploit the commercial potential of government assets through various types of PPP (Ondategui-Parra, 2009; Torchia et al., 2015). Under PPP in healthcare, the private sector is responsible for designing, building, maintaining, and operating hospitals, while the public sector takes care of core medical services such as patient care, recruitment of doctors and nurses. The government has experience and expertise in providing clinical services and ensuring patient welfare, while non-critical services are handled by the private sector.

The quality of care in healthcare systems is a complex and multifaceted issue that requires a comprehensive approach. Measuring and improving quality is challenging due to the subjective nature of healthcare quality, the lack of standardized tools, and the influence of social and cultural factors (Hanefeld et al., 2017; Okunrintemi et al., 2021). Patient satisfaction, quality improvement initiatives, and the role of indicators and standards are crucial in assessing and enhancing the quality of care.

The United States and developing nations face unique challenges in ensuring high-quality healthcare. In the United States, there is a need for systematic evidence and a mandatory national system to track healthcare quality (Schuster et al., 2021). Developing nations, on the other hand, often struggle with inconsistent and poor healthcare quality, but improvements can be achieved through targeted interventions and policy reforms (Kruk et al., 2018).

India's healthcare sector exhibits an extreme range of quality, with challenges such as the growing burden of chronic diseases, lack of reliable data, and systemic issues (Angell et al., 2019). Evaluations of primary care quality in India reveal substandard average quality and significant regional disparities (Powell-Jackson et al., 2013). Socio-economic development and health performance are intertwined in India, with substantial health challenges persisting despite economic advancements (Balarajan et al., 2011).

The private sector plays a significant role in India's healthcare system, with challenges in regulating quality, ensuring affordability, and maintaining accountability (Mackintosh et al., 2016). Quality improvement strategies and public-private partnerships have the potential to transform healthcare delivery in India (Sharma et al., 2021).

To address the quality-of-care issues in healthcare systems, there is a need for significant investment, improved quality standards, efficient monitoring mechanisms, and systemic reforms (Jha et al., 2021). Collaboration between the public and private sectors, along with a focus on patient-centered care and evidence-based practices, can help bridge the quality gap and enhance the standard of healthcare delivery (Prakash, 2022). By prioritizing quality improvement initiatives, utilizing advanced tools and technologies, and fostering a culture of continuous learning and innovation, healthcare systems can work towards providing high quality care to all patients, regardless of their socio-economic background or geographic location (Mate et al., 2021).

Therefore, the quality of care in healthcare systems is a complex and multifaceted issue that requires a comprehensive approach. Measuring and improving quality is challenging due to the subjective nature of healthcare quality, the lack of standardized tools, and the influence of social and cultural factors. Addressing these challenges requires a concerted effort from all stakeholders, including healthcare providers, policymakers, and patients (Mossialos et al., 2022).

2.5 Ayushman Bharat Pradhan Mantri Jan Yojana: A Major Step towards Universal Health Coverage

The Pradhan Mantri Jan Arogya Yojana (PM-JAY), launched in 2018, is a significant step towards achieving Universal Health Coverage (UHC) in India. The scheme aims to provide financial protection and improved healthcare access to the country's poor and vulnerable populations, with a goal of covering over 500 million beneficiaries (Angell et al., 2019). However, the implementation of PM-JAY faces numerous challenges, given the complex landscape of India's healthcare system, which is characterized by inadequate public spending, a fragmented delivery system, and a high burden of communicable and non-communicable diseases (Balarajan et al., 2011; Pandey et al., 2018).

One of the critical challenges in India's pursuit of UHC is the 'missing middle' - the segment of the population that lacks financial protection for health despite having the ability to afford nominal premiums. This group, comprising approximately 30% of India's population, is not covered by any form of health insurance and often relies on out-of-pocket spending to meet their healthcare needs (NITI, 2021). Expanding health insurance coverage to this missing

middle is crucial for protecting them from catastrophic health expenditures and ensuring that no one is left behind in the journey towards UHC (Erlangga et al., 2019).

The impact of health insurance schemes on healthcare access and financial protection in low- and middle-income countries (LMICs) has been the subject of numerous studies. Systematic reviews by Erlangga et al. (2019) and Wagstaff et al. (2020) have found that health insurance schemes in LMICs are associated with increased healthcare utilization and reduced out-of- pocket spending, although the quality of evidence is limited. As India continues to implement and expand the PM-JAY scheme, it is essential to learn from the experiences of other LMICs that have implemented similar health insurance programs (Reich et al., 2016). By drawing on the global evidence base and adapting best practices to the Indian context, policymakers can work towards developing a more inclusive and equitable healthcare system.
The quality of care in India's healthcare system is a complex and multifaceted issue that requires a comprehensive approach (Mohanan et al., 2016; Angell et al., 2019). India's healthcare sector exhibits an extreme range of quality, from globally acclaimed hospitals to facilities providing unacceptably low-quality care. The growing burden of chronic diseases increases the urgency for healthcare quality management, but the lack of reliable data and technical difficulties in measuring quality hamper improvement efforts (Mate et al., 2021). Evaluations of primary care quality in India reveal substandard average quality and significant regional disparities (Powell-Jackson et al., 2013; Das et al., 2015).

The private sector plays a significant role in India's healthcare system, but it also presents challenges in regulating quality, ensuring affordability, and maintaining accountability (Mackintosh et al., 2016; Srinivasan, 2020). Quality improvement strategies and public-private partnerships have the potential to transform healthcare delivery in India, leveraging the strengths of both sectors to improve accessibility, quality, and efficiency of healthcare services (Sharma et al., 2021). However, the privatization of healthcare poses challenges in regulating quality, ensuring affordability, and maintaining accountability, with concerns regarding the commodification of healthcare and the exacerbation of health inequities (Baru & Nundy, 2020). To address the quality-of-care issues in India's healthcare system, there is a need for significant investment, improved quality standards, efficient monitoring mechanisms, and systemic reforms (Jha et al., 2021; Rao et al., 2021). Collaboration between the public and private sectors, along with a focus on patient-centered care and evidence-based practices, can help bridge the quality gap and enhance the standard of healthcare delivery (Prakash, 2022). By prioritizing quality improvement initiatives, utilizing advanced tools and technologies, and fostering a culture of continuous learning and innovation, India's healthcare system can work

towards providing high-quality care to all patients, regardless of their socio-economic background or geographic location (Mate et al., 2021).

Therefore, the PM-JAY scheme represents a significant step towards achieving UHC in India, but its success depends on addressing the complex challenges facing the country's healthcare system. Expanding health insurance coverage to the missing middle, learning from the experiences of other LMICs, and addressing the quality-of-care issues through a comprehensive approach are crucial for ensuring that the scheme achieves its intended goals. By prioritizing investment, quality improvement, and collaboration between the public and private sectors, India can work towards developing a more inclusive, equitable, and high-quality healthcare system that leaves no one behind.

2.5.1 Out-of-Pocket Healthcare Expenditure

Out-of-pocket (OOP) healthcare expenditure remains a significant barrier to accessing quality healthcare services in many low- and middle-income countries (LMICs), including India. Recent studies have shed light on the extent of this problem and its impact on households' financial well-being. A study by Pandey et al. (2018) found that OOP spending on healthcare in India has been increasing steadily, with a significant proportion of households facing catastrophic health expenditures. The study also highlighted the disparities in OOP spending across socioeconomic groups, with the poorest households being the most affected.

Higher socioeconomic status individuals in India have a preference for private healthcare providers due to perceived superior care quality, shorter wait times, and easier access to cutting-edge medical technology (Sengupta & Rooj, 2019). However, households' financial well-being, especially those from lower socioeconomic origins, may suffer significantly if they depend too heavily on OOP spending and private healthcare. According to a recent study by Karan et al. (2022), a considerable percentage of households in India are now living in poverty as a result of the country's rising incidence of catastrophic health expenses.

The impact of health insurance on reducing OOP healthcare expenditure in LMICs has been the subject of numerous recent studies. A systematic review by Erlangga et al. (2019) found that health insurance schemes in LMICs were associated with reduced OOP spending, although the magnitude of the effect varied across different settings and types of insurance. In India, the PM-JAY scheme aims to provide financial protection to the poor and vulnerable by covering a wide range of secondary and tertiary care services. A recent study by Garg et al. (2021) evaluated the early impact of PM-JAY on healthcare utilization and financial risk protection. The study found that PM-JAY beneficiaries had significantly higher utilization of hospital services and lower OOP spending compared to non-beneficiaries. However, the authors noted that the scheme's impact on reducing catastrophic health expenditures was

limited, highlighting the need for further improvements in the design and implementation of the program.

One of the challenges in reducing OOP spending through health insurance schemes is the persistence of informal payments and the lack of price regulation in the private healthcare sector. A recent study by Jain et al. (2021) investigated the prevalence and determinants of informal payments in India's healthcare system. The study found that informal payments were common in both public and private healthcare facilities, with patients from lower socioeconomic backgrounds being more likely to make such payments. The authors emphasized the need for stronger governance mechanisms and price regulation to curb informal payments and improve healthcare affordability.

Addressing the social determinants of health is another critical aspect of reducing OOP spending and improving healthcare access in India. A study by Srivastava et al. (2022) examined the association between socioeconomic status and healthcare utilization in India. The study found that individuals from lower socioeconomic backgrounds had significantly lower utilization of healthcare services, even after accounting for differences in health needs. The authors highlighted the importance of intersectoral collaborations and policies that address the underlying social and economic inequities that influence healthcare access and outcomes.

In conclusion, recent studies have provided valuable insights into the extent and impact of OOP healthcare expenditure in India and the role of health insurance schemes in providing financial risk protection. While the PM-JAY scheme has shown promise in improving healthcare utilization and reducing OOP spending, further efforts are needed to strengthen its design and implementation, address informal payments, and tackle the social determinants of health. By prioritizing these issues and fostering collaborations between the government, private sector, and civil society, India can work towards achieving universal health coverage and ensuring affordable and quality healthcare for all its citizens.

2.5.2 Quality of Care under Ayushman Bharat Pradhan Mantri Jan Arogya Yojana

Recent studies have highlighted the need for greater attention to the quality of healthcare services provided under the Pradhan Mantri Jan Arogya Yojana (PM-JAY) scheme in India. Quality of care, as defined by the Institute of Medicine (IOM), is "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine, 2001). It encompasses several dimensions, such as safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity (WHO, 2006).

A study by Mohanan et al. (2021) assessed the quality of care for cardiovascular diseases in hospitals empanelled under the PM-JAY scheme in the state of Karnataka. The study found that

while the majority of hospitals had adequate infrastructure and staff, there were significant gaps in the quality of care, such as lack of adherence to clinical guidelines, inadequate patient education and counselling, and poor follow-up and referral systems. The study also found that the quality of care varied across hospitals, with public hospitals performing worse than private hospitals on several indicators.

Similarly, a study by Bhatia et al. (2022) evaluated the quality of care for maternal and child health services under the PM-JAY scheme in Uttar Pradesh. Using a mixed-methods approach, the study found that while the scheme had improved access to healthcare services for pregnant women and children, the quality of care was suboptimal, with issues such as inadequate antenatal care, lack of skilled birth attendants, and poor quality of postnatal care. The study also identified several barriers to quality care, including lack of training and motivation of healthcare providers, inadequate supplies and equipment, and poor coordination and referral systems.

A third study by Angell et al. (2023) investigated the quality of care for mental health services under the PM-JAY scheme in Tamil Nadu. Using a participatory action research approach, the study found that while the scheme had increased access to mental health services, the quality of care was poor, with issues such as lack of privacy and confidentiality, inadequate patient involvement in decision-making, and lack of continuity of care. The study also highlighted the need for greater integration of mental health services with primary care and community-based services, as well as the importance of addressing stigma and discrimination against people with mental health conditions.

These studies underscore the importance of using different methodological approaches to assess and improve the quality of care under the PM-JAY scheme. They also highlight the need for a more holistic and patient-centered approach to quality, which goes beyond technical and clinical aspects to include social, emotional, and relational dimensions of care.

To address the challenges of quality of care under the PM-JAY scheme, several initiatives have been undertaken by the National Health Authority and state health agencies. These include the development of quality standards and guidelines for different types of healthcare services, the establishment of quality improvement committees and patient feedback mechanisms at the hospital level, and the provision of training and capacity building for healthcare providers on quality of care.

Several frameworks exist for assessing quality of care, such as the Donabedian model (structure, process, and outcomes) (Donabedian, 1988), the IOM's six dimensions of quality (Institute of Medicine, 2001), and the WHO's quality of care framework for maternal and newborn health (WHO, 2006). Indicators are specific measures that help determine how well a

healthcare system is performing and should be selected carefully to reflect the specific context and resources available (Lawrence & Olesen, 1997).

Patient satisfaction is a crucial measure of healthcare system quality, emphasizing the importance of personal relationships, promptness, and tangibility of services (Senić & Marinković, 2012). Quality improvement methods, such as Lean and Six Sigma, can be used to enhance service systems and processes (Chassin, 2013). The formation of quality improvement networks, like the Nationwide Quality of Care Network in India, can help implement these methods in a sustainable way (Datta et al., 2018).

However, improving quality of care faces several challenges, including balancing stakeholder perspectives, creating accountability, establishing evaluation criteria, selecting appropriate indicators, aligning incentives, and enhancing information systems (McGlynn, 1997). Studies have shown a substantial gap between the potential of healthcare systems and the care currently provided, highlighting issues of overuse, underuse, and misuse of services (Schuster et al., 1998; Shine, 2002).

Recent studies have provided valuable insights into the quality of care under the PM-JAY scheme in India, highlighting the need for a more comprehensive and patient-centered approach to quality improvement. While several initiatives have been undertaken to address these challenges, there is still a long way to go in ensuring that all beneficiaries receive high-quality healthcare services that are safe, effective, patient-centered, timely, efficient, and equitable. By prioritizing quality of care and investing in quality improvement efforts, the PM-JAY scheme can work towards achieving its goal of providing accessible and affordable healthcare to all citizens of India.

2.5.3 Public Private Partnership under Ayushman Bharat Pradhan Mantri Jan Arogya Yojana

One of the key objectives of the AB PM-JAY scheme is to leverage the capacity and expertise of private healthcare providers to expand access to quality healthcare services. A study by Angell et al. (2019) found that the scheme had successfully empanelled a large number of private hospitals, increasing the availability of secondary and tertiary care services for beneficiaries. However, the authors also noted challenges in ensuring the quality and affordability of care in the private sector, highlighting the need for robust monitoring and regulation mechanisms.

PPPs under the AB PM-JAY scheme has also been found to improve the efficiency and sustainability of healthcare delivery. A study by Garg et al. (2020) examined the implementation of the scheme in the state of Uttar Pradesh and found that the use of a PPP model had led to better utilization of resources, reduced waiting times, and increased patient

satisfaction. The authors suggested that the PPP approach could be a viable strategy for improving the performance of public healthcare systems in resource-constrained settings.
However, the effectiveness of PPPs in the AB PM-JAY scheme may depend on various factors, including the design of the partnership, the capacity of the private sector, and the regulatory environment. A study by Jain et al. (2021) analyzed the contracting mechanisms used in the AB PM-JAY scheme and found that the lack of standardized contracts and performance indicators could lead to variations in the quality and cost of care across different states and districts. The authors emphasized the need for more robust governance and accountability frameworks to ensure the success of PPPs in the scheme.

Another challenge in the implementation of PPPs under the AB PM-JAY scheme is ensuring equity in access to healthcare services. A study by Nandi et al. (2020) found that while the scheme had improved access to healthcare for poor and vulnerable populations, there were still disparities in utilization based on factors such as gender, caste, and geographic location. The authors suggested that targeted interventions and outreach efforts may be necessary to address these inequities and ensure that the benefits of the scheme reach all intended beneficiaries.

Lastly, recent studies suggest that PPPs have the potential to improve the implementation and performance of the AB PM-JAY scheme by expanding access to quality healthcare services, improving efficiency and sustainability, and leveraging the capacity of the private sector. However, the effectiveness of PPPs in the scheme depends on various factors, including the design of the partnership, the regulatory environment, and the ability to ensure equity in access to care. Further research is needed to identify best practices and strategies for maximizing the impact of PPPs in the AB PM-JAY scheme and ensuring that the scheme achieves its goal of providing comprehensive health coverage to all vulnerable populations in India.

2.6 Perceived Quality of Care

Recent studies have highlighted the importance of perceived quality of care in influencing healthcare utilization decisions, irrespective of the actual technical quality of care provided. Perceived quality of care is the subjective evaluation of healthcare services by patients and communities, shaped by collective beliefs, traditional values, and peer influences. For instance, in Armenia, despite the high out-of-pocket costs, most people preferred to use district-based clinics and hospitals, where they believed the quality of care to be higher than in the facilities covered by community-based health insurance schemes. Similarly, in Uganda, perceptions of the quality of local maternal care influenced women’s decisions to seek care away from their local area, regardless of transportation availability and distance (Hanefeld et al., 2017).

To assess patient perceptions of healthcare service quality, instruments like HEALTHQUAL and SERVQUAL have been developed and adapted for the healthcare context. SERVQUAL, a widely used model across various industries, assesses five dimensions of service quality: reliability, assurance, tangibles, empathy, and responsiveness (Parasuraman, Zeithaml, & Berry, 1988). HEALTHQUAL, on the other hand, is a more healthcare-specific instrument that builds upon the SERVQUAL model, focusing on care processes, outcomes, and dimensions relevant to the healthcare setting (Lee, 2017; Fatima et al., 2018).

Recent studies have compared the HEALTHQUAL and SERVQUAL models for assessing healthcare service quality. Lee (2017) examined the effects of HEALTHQUAL measurement items using data from a hospital in South Korea, highlighting that HEALTHQUAL focuses specifically on care processes and results with five components: empathy, tangibles, safety, efficiency, and degree of improvements of care service. Teshnizi et al. (2018) evaluated the quality of services in health centers in Mashhad, Iran using both models and found that HEALTHQUAL had higher reliability and validity compared to SERVQUAL in the healthcare context.

A systematic review by Manulik et al. (2021) assessed the use of the SERVQUAL method for evaluating healthcare service quality in Asian countries, aiming to confirm its suitability. Fatima et al. (2018) conducted a literature review of healthcare service quality measurement models, including SERVQUAL, SERVPERF, HEALTHQUAL, PubHosQual, and HospitalQual, highlighting the evolution and adaptation of these models for the healthcare context. Nemati (2021) compared hospital service quality based on the HEALTHQUAL model and patient trust in nurses at university and non-university hospitals in Iran, emphasizing the challenges of using SERVQUAL in healthcare and positioning HEALTHQUAL as a more suitable alternative.

While there are limited studies directly comparing HEALTHQUAL and SERVQUAL, the available evidence suggests that HEALTHQUAL is a more healthcare-specific adaptation of the SERVQUAL model, focusing on care processes, outcomes, and dimensions relevant to the healthcare context (Lee, 2017; Fatima et al., 2018). Some studies have found that HEALTHQUAL has higher reliability and validity compared to SERVQUAL in healthcare settings (Teshnizi et al., 2018; Nemati 2021). However, both models continue to be used and adapted for assessing healthcare service quality in different contexts, with SERVQUAL being widely applied in Asian countries (Manulik et al., 2021).

Lastly, perceived quality of care plays a crucial role in shaping healthcare utilization decisions, and instruments like HEALTHQUAL and SERVQUAL provide valuable insights into patient perceptions of healthcare service quality. While HEALTHQUAL appears to be a more

healthcare-specific adaptation of the SERVQUAL model, both instruments have their merits and limitations. Further research is needed to directly compare the performance and suitability of HEALTHQUAL and SERVQUAL in various healthcare systems and to guide the selection and adaptation of these models for specific contexts. Ultimately, a comprehensive approach to quality improvement should consider not only perceived quality of care but also other dimensions, such as clinical effectiveness, patient safety, and equity of care, while adapting to the specific cultural, social, and economic context of the healthcare system being evaluated.

2.7 Critical Findings

The critical findings from the literature review highlight several key themes and issues related to healthcare quality differentials between public and private facilities, particularly in the context of public-private partnerships (PPPs) in healthcare delivery.

Table 2.1: *Critical Findings of Literature Survey*

Findings of Literature Survey	**References**
Public-private partnerships (PPPs) in healthcare have the potential to improve access to quality services, but their impact on quality remains debatable. Quality differentials can arise due to differences in infrastructure, equipment, human resources, clinical processes, and patient satisfaction.	Ebulue et al. (2024); Montagu & Harding (2012); Muhammed et al. (2017); Rao et al. (2018); Whyle & Olivier (2016)
Unmet needs in family planning persist in many developing countries. PPPs can expand access to services, improve quality, and reach marginalized populations. However, challenges include ensuring sustainability, scalability, and equity.	Agarwal et al. (2019); Appleford & RamaRao (2019); Bellows et al. (2017); Chakraborty et al. (2019); Shelton & Finkle (2016); Thurston et al. (2015)
Quality of care is a multifaceted concept encompassing technical performance, interpersonal aspects, patient contributions, and health system impact. Measuring and improving quality is challenging due to subjectivity, lack of standardized tools, and social and cultural influences.	Brook et al. (2000); Campbell et al. (2000); Donabedian (1988); Figueroa et al. (2019); Hanefeld et al. (2017); Institute of Medicine (2001); Kruk et al. (2018); Mosadeghrad (2012); Nylenna et al. (2015); Okunrintemi et al. (2021); Papanicolas et al. (2019); Prakash (2022)
India's healthcare sector exhibits an extreme range of quality. Challenges include the growing burden of chronic diseases, lack of reliable data, and systemic issues. Evaluations reveal substandard average quality and regional disparities.	Angell et al. (2019); Balarajan et al. (2011); Bloom et al. (2014); Das et al. (2015); Gopal (2019); Mohanan et al. (2016); Powell-Jackson et al. (2013); Ramani & Mavalankar (2006); Rao et al. (2021); Rudrappa et al. (2018)

Findings of Literature Survey	References
The private sector plays a significant role in India's healthcare but poses challenges in regulating quality, affordability, and accountability. Quality improvement strategies and PPPs have the potential to transform healthcare delivery.	Agarwal & Ganesh (2017); Baru (2020); Baru & Nundy (2020); Basu et al. (2012); Bhat (1993); Mackintosh et al. (2016); Ondategui-Parra (2009); Peabody et al. (2006); Rao (2012); Sengupta et al. (2017); Sharma et al. (2021); Srinivasan (2020); Torchia et al. (2015)
The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) aims to provide financial protection and improved healthcare access to India's poor and vulnerable populations. Challenges include covering the 'missing middle', learning from other LMICs, and addressing quality of care issues.	Aashima, & Sharma (2024); Angell et al. (2019); Balarajan et al. (2011); Erlangga et al. (2019); Garg et al. (2021); NITI (2021); Pandey et al. (2018); Reich et al. (2016); Wagstaff et al. (2020)
Out-of-pocket (OOP) healthcare expenditure is a significant barrier to accessing quality healthcare in India. PM-JAY has shown promise in reducing OOP spending, but further efforts are needed to strengthen its implementation and tackle social determinants of health.	Nanda & Sharma (2023); Erlangga et al. (2019); Garg et al. (2021); Jain et al. (2021); Karan et al. (2022); Pandey et al. (2018); Sengupta & Rooj (2019); Srivastava et al. (2022)
Recent studies highlight the need for greater attention to quality of care under PM-JAY. Issues include lack of adherence to guidelines, inadequate patient education, and poor coordination. A holistic, patient-centered approach to quality improvement is necessary.	Kanwal et al. (2024); Angell et al. (2023); Donabedian (1988); Institute of Medicine (2001); Lawrence & Olesen (1997); McGlynn (1997); Mohanan et al. (2021); WHO (2006)
PPPs under PM-JAY have the potential to expand access, improve efficiency, and leverage private sector capacity. However, their effectiveness depends on partnership design, regulatory environment, and ensuring equity in access to care.	Angell et al. (2019); Nandi et al. (2020)
Perceived quality of care plays a crucial role in shaping healthcare utilization decisions. Instruments like HEALTHQUAL and SERVQUAL provide insights into patient perceptions of healthcare service quality, with HEALTHQUAL being a more healthcare-specific adaptation.	Fatima et al. (2018); Hanefeld et al. (2017); Lee (2017); Nemati (2021); Parasuraman, Zeithaml, & Berry (1988); Teshnizi et al. (2018)

These findings provide important insights into the complexities of measuring and improving healthcare quality, the potential benefits and challenges of PPPs, and the factors influencing patient perceptions and experiences of care. The following subsections summarize the most significant findings from the reviewed literature, which form the foundation for identifying research gaps and developing the conceptual framework for this study.

Table 2.2: *Critical Parameters from Literature Survey*

Findings of Literature Survey	**Critical Parameters**
Public-private partnerships (PPPs) in healthcare have the potential to improve access to quality services, but their impact on quality remains debatable. Quality differentials can arise due to differences in infrastructure, equipment, human resources, clinical processes, and patient satisfaction.	- Infrastructure, equipment, and human resources - Clinical processes and outcomes - Patient satisfaction and experience
Unmet needs in family planning persist in many developing countries. PPPs can expand access to services, improve quality, and reach marginalized populations. However, challenges include ensuring sustainability, scalability, and equity.	- Equity and affordability - Sustainability and scalability of interventions
Quality of care is a multifaceted concept encompassing technical performance, interpersonal aspects, patient contributions, and health system impact. Measuring and improving quality is challenging due to subjectivity, lack of standardized tools, and social and cultural influences.	- Social and cultural context -Patient-centeredness and holistic approach to quality
India's healthcare sector exhibits an extreme range of quality. Challenges include the growing burden of chronic diseases, lack of reliable data, and systemic issues. Evaluations reveal substandard average quality and regional disparities.	- Governance, regulation, and accountability - Data quality and availability
The private sector plays a significant role in India's healthcare but poses challenges in regulating quality, affordability, and accountability. Quality improvement strategies and PPPs have the potential to transform healthcare delivery.	- Public-private collaboration and partnership design - Quality improvement initiatives and strategies
The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) aims to provide financial protection and improved healthcare access to India's poor and vulnerable populations. Challenges include covering the 'missing middle', learning from other LMICs, and addressing quality of care issues.	- Financial protection and healthcare access - Lessons from other LMICs - Quality of care under PM-JAY
Out-of-pocket (OOP) healthcare expenditure is a significant barrier to accessing quality healthcare in India. PM-JAY has shown promise in reducing OOP spending, but further efforts are needed to strengthen its implementation and tackle social determinants of health.	- OOP healthcare expenditure - Social determinants of health
Recent studies highlight the need for greater attention to quality of care under PM-JAY. Issues include lack of adherence to guidelines, inadequate patient education, and poor coordination. A holistic, patient-centered approach to quality improvement is necessary.	- Adherence to clinical guidelines - Patient education and involvement - Care coordination and continuity
PPPs under PM-JAY have the potential to expand access, improve efficiency, and leverage private sector capacity. However, their effectiveness depends on partnership design, regulatory environment, and ensuring equity in access to care.	- Partnership design and governance - Regulatory environment - Equity in access to care
Perceived quality of care plays a crucial role in shaping healthcare utilization decisions. Instruments like HEALTHQUAL and SERVQUAL provide insights into patient perceptions of healthcare service quality, with HEALTHQUAL being a more healthcare-specific adaptation.	- Perceived quality of care - HEALTHQUAL and SERVQUAL instruments

The critical findings from the literature review highlight several key themes regarding quality differentials between public and private healthcare facilities, particularly in the context of

public-private partnerships (PPPs). While some studies suggest private facilities generally perform better on indicators like infrastructure, equipment, human resources, and patient satisfaction, others emphasize the variability in quality across different contexts and PPP arrangements. The findings underscore the importance of robust governance mechanisms, regulatory frameworks, and monitoring systems to ensure the quality and equity of healthcare services delivered through PPPs. Challenges related to sustainability, scalability, and addressing issues of affordability and access for marginalized populations persist. Overall, the literature indicates that while PPPs have potential to improve healthcare delivery, their effectiveness depends on careful design, implementation, and oversight tailored to local contexts. Further research using rigorous methodologies is needed to provide more conclusive evidence on the impact of PPPs on healthcare quality and to identify best practices for maximizing their benefits while mitigating potential drawbacks.

2.8 Research Gap

The literature review led to the following research gaps regarding the study:

1. No evaluation is done to measure the trend and budgetary allocation and actual spending on public healthcare facilities including PPP in Jharkhand.
2. No study is done to measure the quality differential in access and delivery of public and private health care facilities in Jharkhand.
3. No evaluation is done to measure and assess the success or failure of PPP in healthcare delivery system.

Addressing these research gaps can provide valuable insights to inform policy decisions and improve healthcare delivery in Jharkhand.

2.9 Conceptual Framework: Patients

The conceptual framework for patients in this study is designed to examine the various factors that influence patients' perceptions of healthcare quality in public and private facilities under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme in Jharkhand. This framework incorporates key dimensions of healthcare quality as identified in the literature, including safety, effectiveness, patient-centeredness, and efficiency. It also considers patient characteristics, hospital attributes, and broader contextual factors that may shape patients' experiences and evaluations of care quality. By mapping these interrelated components, the framework provides a structured approach to analyzing the quality differentials between public and private healthcare delivery from the patient's perspective.

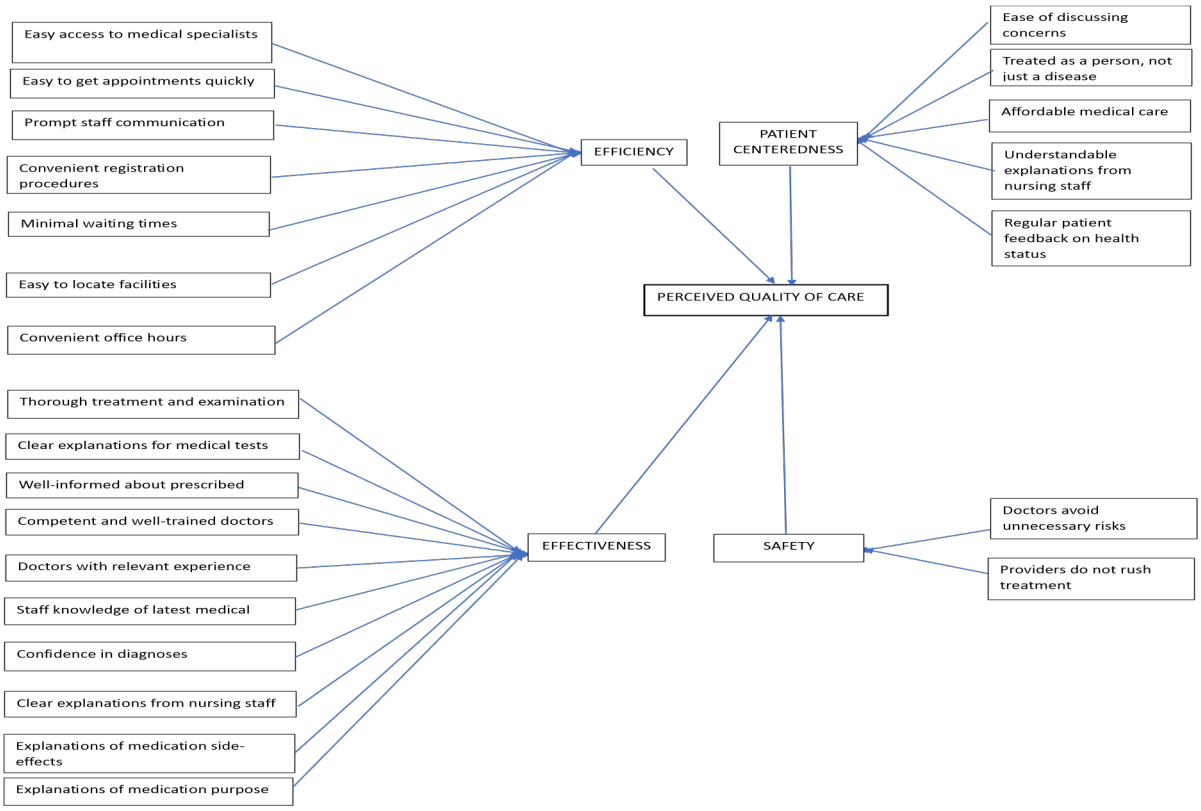


Figure 2.1: *Quality of Care Conceptual Framework: Patient's Perspective (***Source:** Author)

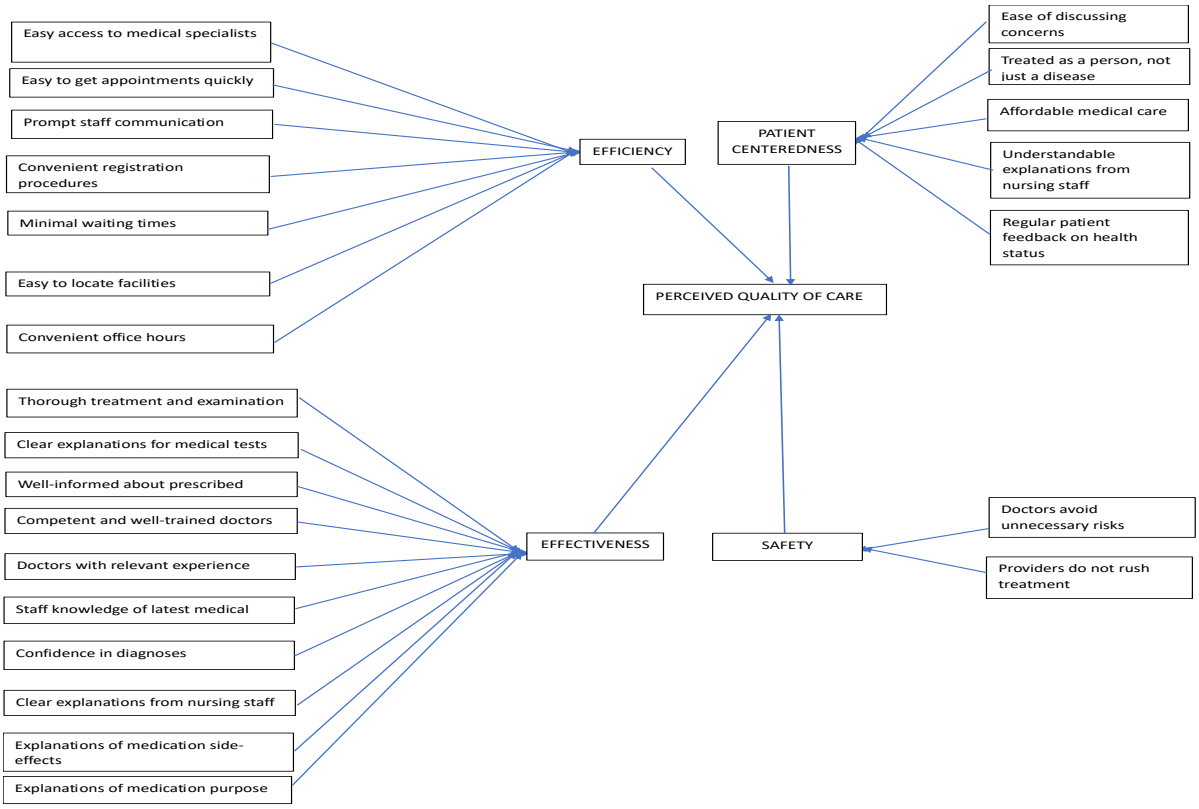
The patient-focused conceptual framework presented here offers a comprehensive lens through which to examine healthcare quality differentials under the AB-PMJAY scheme. By integrating multiple dimensions of care quality with patient and hospital characteristics, this framework enables a nuanced analysis of the factors driving patient perceptions and experiences. This approach will guide data collection, analysis, and interpretation of findings related to quality differentials between public and private healthcare facilities from the critical perspective of the patients they serve. The insights generated through this framework can inform policy decisions and quality improvement initiatives aimed at enhancing the overall patient experience and outcomes within the AB-PMJAY scheme in Jharkhand.

2.10 Conceptual Framework: Hospital Staffs

The conceptual framework for hospital staff in this study is designed to examine the various factors that influence healthcare quality from the perspective of those directly involved in delivering care. This framework incorporates key dimensions of healthcare quality as identified in the literature, including safety, effectiveness, efficiency, and patient-centeredness. It also considers organizational factors, such as leadership, teamwork, and resource availability, that may impact staff performance and, consequently, the quality of care provided. By mapping these interrelated components, the framework provides a structured approach to analyzing the

quality differentials between public and private healthcare delivery from the healthcare provider's perspective.

Figure 2.2: *Quality of Care Conceptual Framework: Staff's Perspective* (**Source:** Author)



The hospital staff-focused conceptual framework presented here offers a comprehensive lens through which to examine healthcare quality differentials under the AB-PMJAY scheme. By integrating multiple dimensions of care quality with organizational factors and staff characteristics, this framework enables a nuanced analysis of the factors driving healthcare quality from the provider's perspective. This approach will guide data collection, analysis, and interpretation of findings related to quality differentials between public and private healthcare facilities from the critical viewpoint of those delivering care. The insights generated through this framework can inform policy decisions and quality improvement initiatives aimed at enhancing the overall healthcare delivery system and staff performance within the AB-PMJAY scheme in Jharkhand.

Table 2.3: *Key Components of Conceptual Frameworks*

Sl.	Research Objectives	Research Questions	Theories	Hypotheses
1	To study the availability of basic and specialized healthcare services in Jharkhand.	What basic and specialty healthcare facilities (both public and private) are available in Jharkhand?	1.Health Production Function Model 2. Grossman Model of Health Demand 3. Principal-Agent Model	

			4. Pareto Optimality Principle	
2	To study the trend of government expenditure on healthcare services in Jharkhand.	What is the trend in budgetary allocation and actual spending on public healthcare facilities (including those in the PPP mode) in Jharkhand?	1.Pareto Optimality Principle 2.Kaldor-Hicks-Pasinetti Efficiency 3.Principal-Agent Model 4.Health Production Function Model	
3	To assess the need of adoption of PPP mode in the healthcare sector in Jharkhand	Is there a need for PPP model in delivering healthcare facilities in Jharkhand?	1.Pareto Optimality Principle 2.Principal-Agent Model 3.Kaldor-Hicks-Pasinetti Efficiency 4.Utility Theory of Value	
4	To map the quality differentials between public and private healthcare facilities in Jharkhand. In addition, the study throws some light on the existence of quality differential in the access and delivery of public and private healthcare facilities in Jharkhand.	Does a quality differential exist in delivery of public and private healthcare facilities in Jharkhand?	**H1**: 1. Pareto Optimality Principle 2.Utility Theory of Value 3.Principal-Agent Model 4.Bounded Rationality 5.Social Norms **H2**: 1. Utility Theory of Value 2. Social Norms 3.Bounded Rationality 4.Principal-Agent Model **H_{2A}** :1. Principal-Agent Model 2. Social Norms 3.Bounded Rationality 4. Utility Theory of Value **H_{2B}** :1. Utility Theory of Value 2. Principal-Agent Model 3.Social Norms **H_{2C}:** 1. Utility Theory of Value 2. Principal-Agent Model 3. Social Norms **H3 :**1. Social Norms 2. Utility Theory of Value 3. Principal-Agent Model 4. Social Norms	**H1:** The quality of healthcare facilities/services provided by private entities is better than those provided by the public-entities/healthcare system/network **H2**: The proportion of patients who rank the quality of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital. **H_{2A}:** Safety aspect of Quality differential-Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals. **H_{2B}:** Patient Centredness aspect of Quality differential-Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals

			5. Pareto Optimality Principle	than in public hospitals. **H_{2C}:** Effectiveness aspect of Quality differential- Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals. **H_{2D}:** The mean sentiment score of private hospitals is greater than that of public hospitals. **H3:** The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital.

The table summarizes the key components of the conceptual frameworks for patients and hospital staff. It outlines the main dimensions of healthcare quality considered in this study - safety, effectiveness, patient-centeredness, and efficiency - along with specific indicators used to measure each dimension from both the patient and staff perspectives. This comprehensive framework integrates multiple aspects of healthcare quality and allows for a holistic assessment of quality differentials between public and private facilities. By examining quality from both the demand side (patients) and supply side (staff), the study aims to provide a nuanced understanding of healthcare delivery under the AB-PMJAY scheme in Jharkhand. The indicators selected cover a range of factors that influence perceived and actual quality of care, from technical competence to interpersonal aspects of care delivery. This multidimensional approach enables a thorough exploration of potential quality gaps and areas for improvement in the healthcare system.

2.11 Conclusion

The literature review provides a comprehensive analysis of various aspects of healthcare delivery, focusing on public-private partnerships (PPPs), quality of care, the Ayushman Bharat

Pradhan Mantri Jan Arogya Yojana (PM-JAY), out-of-pocket healthcare expenditure, and perceived quality of care.

PPPs in healthcare have the potential to improve access to quality services, but their impact on quality remains debatable. Unmet needs in family planning persist in many developing countries, and PPPs can help address these challenges. Quality of care is a multifaceted concept, and measuring and improving quality is challenging due to various factors, including the lack of standardized tools and the influence of social and cultural factors.

India's healthcare sector exhibits an extreme range of quality, with challenges such as the growing burden of chronic diseases, lack of reliable data, and systemic issues. The private sector plays a significant role in India's healthcare system, but it also presents challenges in regulating quality, affordability, and accountability. Quality improvement strategies and PPPs have the potential to transform healthcare delivery in India.

The PM-JAY scheme aims to provide financial protection and improved healthcare access to India's poor and vulnerable populations. However, challenges include covering the 'missing middle', learning from other LMICs, and addressing quality of care issues. Out-of-pocket healthcare expenditure remains a significant barrier to accessing quality healthcare in India, and while PM-JAY has shown promise in reducing this burden, further efforts are needed to strengthen its implementation and tackle social determinants of health.

Recent studies highlight the need for greater attention to the quality of care under PM-JAY, with issues such as lack of adherence to guidelines, inadequate patient education, and poor coordination. PPPs under PM-JAY have the potential to expand access, improve efficiency, and leverage private sector capacity, but their effectiveness depends on various factors, including partnership design, the regulatory environment, and ensuring equity in access to care. Lastly, perceived quality of care plays a crucial role in shaping healthcare utilization decisions, and instruments like HEALTHQUAL and SERVQUAL provide valuable insights into patient perceptions of healthcare service quality.

In conclusion, the literature review highlights the complex challenges and opportunities in healthcare delivery, emphasizing the need for a comprehensive approach to quality improvement, strengthening PPPs, and addressing financial barriers to healthcare access.

CHAPTER III
RESEARCH METHODOLOGY

Chapter 3 | RESEARCH METHODOLOGY

3.1 Introduction

The main objective of the present study is to provide an overview on the assessment of difference in quality of healthcare provided by the healthcare units including hospitals and the healthcare received by the patients of Ranchi district of Jharkhand. The distinction in the quality of healthcare is studied between caregivers of public hospitals and private hospitals. Also, the patients of both public and private hospitals are taken into consideration.

3.2 Research Questions

This study aims to address several key research questions regarding healthcare delivery and quality in Jharkhand, with a focus on public-private partnerships. The research questions were developed based on gaps identified in the literature review and the study's objectives. The main research questions guiding this study are:

1. What types of healthcare facilities and infrastructure (public and private) are available in Jharkhand?
2. What is the trend in budgetary allocation and actual spending on public healthcare facilities (including those in the PPP mode) in Jharkhand?
3. Does a quality differential exist in access to and delivery of public and private healthcare facilities in Jharkhand?
4. Is there a need for PPP model in delivering healthcare facilities in Jharkhand?

These research questions will guide the data collection and analysis to provide insights into the healthcare landscape, expenditure patterns, quality differentials, and potential for public private partnerships in Jharkhand's healthcare sector. By addressing these questions, this study aims to contribute valuable knowledge to inform policy and practice for improving healthcare access and quality in the state.

3.3 Statement of the problem

The study investigates the quality differentials between public and private healthcare facilities in Jharkhand, India, under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (ABPMJAY) scheme. Jharkhand faces significant challenges in providing accessible and quality healthcare, particularly in rural and remote areas. The study aims to assess the availability and accessibility of healthcare services, the impact of government initiatives on healthcare quality, and the potential of Public-Private Partnerships (PPPs) to improve healthcare delivery in underserved areas. By establishing benchmarks and developing a framework for assessing and mapping quality differentials, the study seeks to provide insights

and recommendations to enhance the quality and equity of healthcare services in Jharkhand and inform the effective implementation of PPPs in the healthcare sector.

3.4 Research Objectives

More specifically, it seeks to dwell upon the following issues:

1. To study the availability of types of healthcare facilities and infrastructure in Jharkhand.
2. To study the pattern of government expenditure on healthcare services in Jharkhand. An attempt is made to understand the budgetary allocation and actual spending on public healthcare facilities including those in the PPP mode in Jharkhand.
3. To assess the need of adoption of PPP mode in the healthcare sector in Jharkhand. An attempt has been made to understand the need for PPP model in delivering healthcare facilities in Jharkhand.
4. To map the quality differentials between public and private healthcare facilities in Jharkhand. In addition, the study throws some light on the existence of quality differential in the access and delivery of public and private healthcare facilities in Jharkhand.

This research contributes to a better understanding of Jharkhand's healthcare landscape and offers a foundation for evidence-based policy decisions. It emphasizes the need for continued investment in healthcare infrastructure, efficient resource allocation, and innovative partnerships to enhance the quality and accessibility of healthcare services for all residents of Jharkhand.

3.5 Causal Models

There are three questions which is answered by the causal model.

1. Why do patients select a particular hospital?
2. How does the patients' experiences at the hospital affect their perception of quality of care?
3. How can we compare the experiences of two distinct groups of patients and staff?

The answers to these questions reflect the sampling strategies which is then used for further analysis.

Patients select a hospital on the basis of their perceptions and as they visit the hospital, their perceptions are established through perceived quality score. Basically the experience regarding the hospital is based on the four major factors i.e., efficiency, effectiveness, safety and patient centeredness (Srinivasan, 2010). There are other factors which also affects the selection of the hospital apart from their experiences, those are the cost of treatment, distance of the hospital from their home and hospital speciality. However, except the perception regarding the hospital, cost is nullified by considering only AB-PMJAY empanelled hospitals and patients. Also, only those hospitals are considered where other hospitals are present within

the 5kms radius. This eliminates the transportation cost and time spent, which could impact the selection of an hospital too. Since other hospitals are present within the range, the particular hospital is selected due to patients' perception about it. In the study only OPD patients are considered which nullifies the speciality of the hospital as a reason for selecting a particular hospital. Hence it is only the perceived quality which creates a causal path to the selected hospital.

Hospitals were selected through Purposive Sampling, Simple Random Sampling method was used to select the patients. This reduced the sampling bias to zero and Average Treatment Effect is equal to Average Perceived Quality Score generated through patients' responses of the questions based on the four factors that comprises the perceived quality.

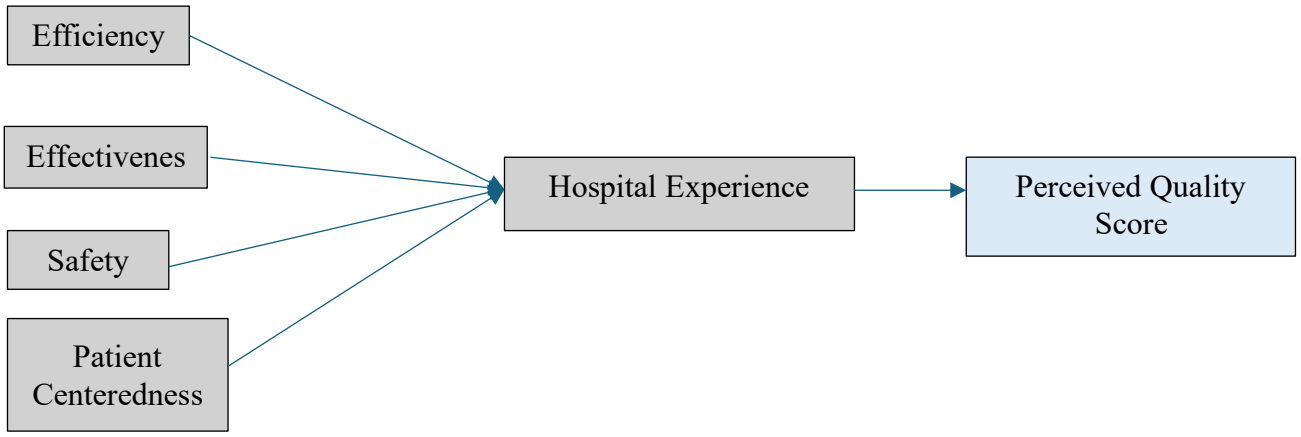


Figure 3.1(a): *Causal Model*

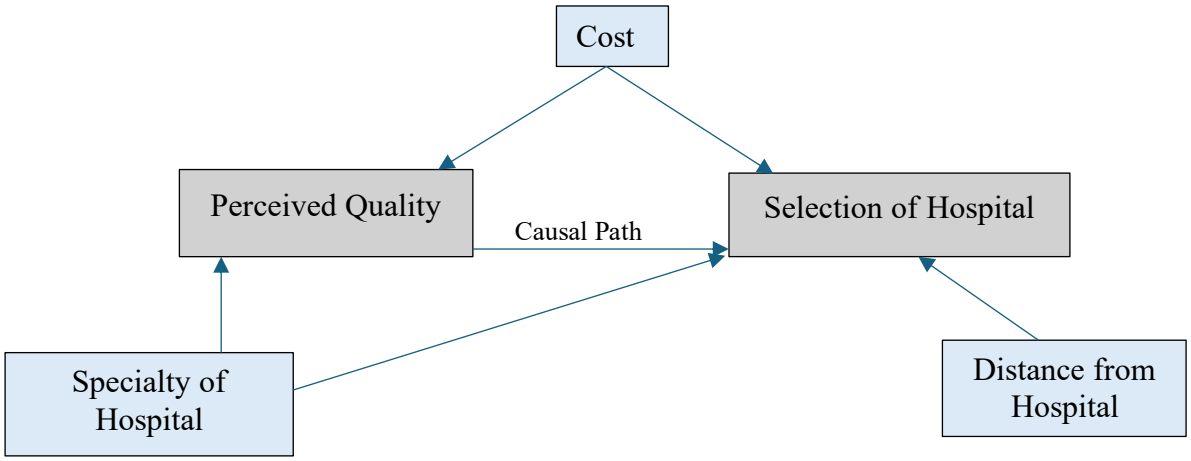


Figure 3.1(b): *Causal Model*

3.6 Theoretical Models

The theoretical foundation draws on several economic and healthcare theories to provide a comprehensive lens for examining the complex factors influencing healthcare quality, resource allocation, and the interplay between public and private sectors. The key theoretical models

and frameworks that inform the study's approach to analyzing quality differentials in healthcare delivery through public-private partnerships in Jharkhand is mentioned as follows.

1. Kaldor-Pasinetti Theory of Distribution [Cambridge Growth Model]
    a. The most remarkable results of Kaldor-Pasinetti approach to growth and income distribution are known as Cambridge Theorem.
    b. It states that the rate of profit in an economy on the long period growth path is the ratio of the natural rate of growth to pure capitalists' propensity to save.
    c. In an economy with institutional investors, investment and hence growth are likely to be influenced by the decisions of such investors. But under modern capitalism there are many high technology firms which present institutional investors with substantially greater problems of risk and asymmetric information than firms with less dynamic technologies. It is therefore reasonable to assume a correlation between technological level and the degree to which accumulation is financed from retained profits.
    d. Private Sector is motivated by the returns on capital and hence will not invest in the public goods like healthcare.
2. Utility Theory of Value
    a. The theory attempts to explain the exchange value or price of goods and services.
    b. Key questions it tries to address are:
        i. Why goods and services are priced as they are?
        ii. How the value of goods and services comes about? and
        iii. How to calculate the correct price of goods and services (if such a value exists)?
    c. This explains the price/cost of providing social goods such as healthcare.
3. Pareto Optimality Principle
    a. Pareto Efficiency is a situation where no individual or preference criterion can be made better off without making at least one individual or preference criterion worse-off.
    b. Market success is defined as the ability of a set of idealized competitive markets to achieve an equilibrium allocation of resources that is Pareto optimal in terms of resource allocation.
    c. Market failure is defined as an inefficient allocation of resources; it implies Pareto Inefficiency.

4. Health Production Function Model: This model examines the relationship between healthcare inputs (such as healthcare expenditure, number of healthcare providers, etc.) and health outcomes. It could be used to analyse the efficiency and effectiveness of healthcare spending and interventions in improving population health.
5. Grossman Model of Health Demand: This model views health as a durable capital stock that produces an output of healthy time. It could be applied to understand how individuals make decisions about investing in their health through healthcare utilization and lifestyle choices, and how this affects health outcomes and healthcare costs.
6. Principal-Agent Model: This model is relevant in the context of healthcare providers (agents) acting on behalf of patients (principals). It could be used to examine issues such as information asymmetry, provider incentives, and how these factors influence healthcare quality and costs.
7. Bounded Rationality: This concept, introduced by Herbert A. Simon, suggests that when individuals make decisions, their rationality is limited by the available information, cognitive limitations, and time constraints. In the context of healthcare, this could explain why patients may not always choose the most cost-effective or quality-optimal healthcare options.
8. Social Norms: People's behavior is often influenced by what they perceive as normal or acceptable within their social context. Leveraging social norms could be effective in promoting healthy behaviours or encouraging the utilization of healthcare services.

These models offer complementary perspectives on healthcare delivery, quality assessment, decision-making processes, and resource allocation. By integrating insights from economic theories like the Kaldor-Pasinetti model and Pareto optimality with healthcare-specific frameworks like the Health Production Function model, this study aims to provide a nuanced analysis of the factors driving quality differentials between public and private healthcare facilities in Jharkhand.

3.6a. Definition of Constructs

Healthcare quality is recognized as a multi-dimensional concept, with general consensus that it can be measured, though no widely available public toolkit for assessment exists (Brook et al., 2000). Experts diverge in their views on the specific domains it encompasses (Lawrence and Olsen, 1997; Donabedian, 1998; Çınaroğlu & Başer, 2016; Nemati et al., 2020). A key measure of healthcare service quality is patient satisfaction (Narang, 2010; Senić & Marinković, 2012), which is often driven by patients' subjective evaluations, known as perceived quality of care. This perceived quality emerges from a blend of individual experiences, processed information, and factors such as trust in providers, cultural beliefs, and social norms. Importantly, perceived

quality may not always reflect clinical indicators or actual care quality (Hanefeld et al., 2017). Recent studies have favoured the use of HEALTHQUAL to assess care quality, noting its effectiveness in capturing patient satisfaction (Liu & Xiaohang, 2023). But however improved and expanded, it should not be regarded as the sole multi-item scale for assessing healthcare service quality.

***Table 3.1**: Indicators for the patients' perspective, retrieved from the literature reviewed*

Indicators	Source Studies	SERVQUAL Dimensions	HEALTHQUAL Dimensions
I have easy access to the medical specialists I need.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Safety
When I go for medical care, they are careful to check everything when treating and examining me.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Empathy
Those who provide my medical care sometimes hurry too much when they treat me.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Empathy
Doctors are good about explaining the reason for medical tests.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Empathy
I'm informed well for prescription of given tablets.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Empathy
I find difficult to talk about things that concern me.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Empathy	Empathy
I feel that I'm treated as person rather than a disease.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Empathy	Empathy
I have to pay for more of my medical care than I can afford.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013		Efficiency
My doctors are very competent and well-trained.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Assurance	Safety
Some of the doctors I have seen lack experience with my medical problems.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Assurance	Safety
The medical staff that treats me knows about the latest medical developments.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi,	Assurance	Tangibles

	S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013		
Sometimes doctors make me wonder if their diagnosis is correct.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Assurance	Safety
Doctors never expose me to unnecessary risk.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Assurance	Safety
Nursing staff gave sufficient explanation on symptoms and treatment plans that were easy to comprehend.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Empathy
Nursing staff explain things in an understandable way regarding my query.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Empathy
Physician/Nurse explained possible medication side effects.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Efficiency
Physician/Nurse explained what medication was for.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Efficiency
Regular feedback from the patient about health status is taken.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Empathy
I find it easy to get an appointment for medical care right away.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Efficiency
Staff was prompt in receiving and returning phone calls*	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Efficiency
The registration procedure for consultations was convenient.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability	Efficiency
I am usually kept waiting for a long time when I am at the doctor's office.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness	Efficiency
Hospital facilities were easy to locate (e.g., consultation room, diagnostic department, physical therapy room, and restroom).	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Tangibles	Tangibles
The office where I get medical care should be open for more hours than it is.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi,	Tangibles	Efficiency

	S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013		
Patient wards, toilets and waiting area are clean.	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Tangibles	Tangibles

***Table3.2**: Indicators for the caregivers' perspective, retrieved from the literature reviewed*

Indicators	**Source Studies**	**SERVQUAL/HEALTHQUAL Dimensions**
We have enough staff to handle the workload	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness
We use more agency/temporary staff than is best for patient care	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness
We work in "crisis mode" trying to do too much, too quickly	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Responsiveness
There is good cooperation among hospital units that need to work together	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Assurance /Empathy
Hospital units work well together to provide the best care for patients	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Assurance/Efficiency
Problems often occur in the exchange of information across hospital units	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability/Efficiency
Important patient care information is often lost during shift changes	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Reliability/Tangible
Shift changes are problematic for patients in this hospital	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Efficiency
Our procedures and systems are good at preventing errors from happening	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Quality aspects in the degree of improvements of care services (Results)
Staff feel like their mistakes are held against them	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Empathy

Hospital management provides a work climate that promotes patient safety	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Quality aspects in the degree of improvements of care services (Results)
Hospital management seems interested in patient safety only after an adverse event happens	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Safety
Patient safety is never sacrificed to get more work done	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Safety
We are actively doing things to improve patient safety	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Safety
After we make changes to improve patient safety, we evaluate their effectiveness	Y. Liu and S. Chujuarjeen, 2023 Nemati, R., Bahreini, M., Pouladi, S. et al., 2020, Ari Melo Mariano et al., 2022, Hedsköld et. al, 2013	Safety

The present study follows the framework of Srinivasan (2010), identifying six key domains of healthcare quality: safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity. While equity falls outside the scope of this study, timeliness is integrated within the concept of service efficiency. Thus, the analysis focuses on four dimensions—safety, patient centeredness, effectiveness, and efficiency—to measure the quality of care as perceived by patients and healthcare staff. For calculation purposes, effectiveness and efficiency are considered together.

Table 3.3: *Healthcare Quality Indicators–Patients' Survey*

Indicators	**Source Studies**	**Dimensions**
I have easy access to the medical specialists I need.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency
I find it easy to get an appointment for medical care right away.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency
Staff was prompt in receiving and returning phone calls.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency
The registration procedure for consultations was convenient.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency
I am usually kept waiting for a long time when I am at the doctor's office.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency
Hospital facilities were easy to locate.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency

The office where I get medical care should be open for more hours than it is.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Hedsköld et al. (2013)	Efficiency
When I go for medical care, they are careful to check everything when treating and examining me.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
Doctors are good about explaining the reason for medical tests.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
I am informed well for prescription of given tablets.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
My doctors are very competent and well-trained.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
Some of the doctors I have seen lack experience with my medical problems.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
The medical staff that treats me knows about the latest medical developments.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
Sometimes doctors make me wonder if their diagnosis is correct.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
Nursing staff gave sufficient explanation on symptoms and treatment plans that were easy to comprehend.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
Physician/Nurse explained possible medication side effects.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
Physician/Nurse explained what medication was for.	Nemati et al. (2020) Salyers et al. (2016) Zecevic et al. (2016)	Effectiveness
I find difficult to talk about things that concern me.	Mihaljevic et al. (2022) Zhou et al. (2018) Hedsköld et al. (2013)	Patient Centeredness
I feel that I am treated as person rather than a disease.	Mihaljevic et al. (2022) Zhou et al. (2018) Hedsköld et al. (2013)	Patient Centeredness
I have to pay for more of my medical care than I can afford.	Mihaljevic et al. (2022) Zhou et al. (2018) Hedsköld et al. (2013)	Patient Centeredness
Doctors never expose me to unnecessary risk.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Nemati et al. (2020)	Safety
Those who provide me medical care sometimes hurry too much when they treat me.	Y. Liu and S. Chujuarjeen (2023) Ari Melo Mariano et al. (2022) Nemati et al. (2020)	Safety

Table 3.4: *Healthcare Quality Indicators–Staff Survey*

Indicators	**Source Studies**	**Dimensions**
We have enough staff to handle the workload.	Farr & Cressey (2015)	Efficiency

	Sinha (2017)	
We use more agency/temporary staff than is best for patient care.	Farr & Cressey (2015) Sinha (2017)	Efficiency
We work in "crisis mode" trying to do too much, too quickly.	Farr & Cressey (2015) Sinha (2017)	Efficiency
Problems often occur in the exchange of information across hospital units.	Farr & Cressey (2015) Sinha (2017)	Efficiency
There is good cooperation among hospital units that need to work together.	Annegret et al. (2022) Carrie, Leslie & Gill (2023)	Effectiveness
Our procedures and systems are good at preventing errors from happening.	Annegret et al. (2022) Carrie, Leslie & Gill (2023)	Effectiveness
After we make changes to improve patient safety, we evaluate their effectiveness.	Annegret et al. (2022) Carrie, Leslie & Gill (2023)	Effectiveness
Shift changes are problematic for patients in this hospital.	Farr & Cressey (2015) Sinha (2017)	Patient Centeredness
Hospital units work well together to provide the best care for patients.	Annegret et al. (2022) Carrie, Leslie & Gill (2023)	Patient Centeredness
Staff feel like their mistakes are held against them.	Annegret et al. (2022) Carrie, Leslie & Gill (2023)	Patient Centeredness
Important patient care information is often lost during shift changes.	Clark & Donaldson (2008) Al-Jabri et al. (2021)	Patient Centeredness
Hospital management provides a work climate that promotes patient safety.	Clark & Donaldson (2008) Al-Jabri et al. (2021)	Safety
Hospital management seems interested in-patient safety only after an adverse event happens.	Clark & Donaldson (2008) Al-Jabri et al. (2021)	Safety
Patient safety is never sacrificed to get more work done.	Clark & Donaldson (2008) Al-Jabri et al. (2021)	Safety
We are actively doing things to improve patient safety.	Clark & Donaldson (2008) Al-Jabri et al. (2021)	Safety

3.6b Hypotheses

The following hypotheses are postulated for testing in the study from the perspectives of the patients:

H_1: The quality of healthcare facilities/services provided by private entities is better than those provided by the public entities/healthcare system/network.

H_2: The proportion of patients who rank the quality of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital. H_{2A}: Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals. (Effectiveness)

H_{2B}: Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals. (Safety)

H_{2C}: Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals than in public hospitals. (Patient Centredness)

H_{2D} : The mean sentiment score of private hospitals is greater than that of public hospitals.

The following hypothesis are postulated for testing in the study from the perspectives of the medical staffs:

H_3: The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital.

3.7 Research Design

This study employs a mixed-methods approach to investigate the quality differentials between public and private healthcare facilities in Jharkhand, India under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme. The research design combines quantitative analysis of patient outcomes and satisfaction surveys with qualitative interviews of healthcare providers and administrators along with the reviews of the patients obtained from the secondary data.

Table 3.5: *Research Design*

Research Questions	Research Objectives	Data Source	Analysis
What basic and specialty healthcare facilities (both public and private) are available in Jharkhand?	To study the availability of basic and specialized healthcare services in Jharkhand.	Annual Economic Surveys, NFHS Reports, State Health Reports, Field Work.	Trend analysis.
What is the trend in budgetary allocation and actual spending on public healthcare facilities	To study the trend of government expenditure on healthcare services in Jharkhand.	Annual Economic Surveys, NFHS Reports, State Health Reports.	Trend analysis.

(including those in the PPP mode) in Jharkhand?			
Is there a need for PPP model in delivering healthcare facilities in Jharkhand?	To assess the need of adoption of PPP mode in the healthcare sector in Jharkhand	NFHS Reports, State Health Reports, Field Work.	Trend Analysis of Unmet need analysis based on OOPS
Does a quality differential exist in delivery of public and private healthcare facilities in Jharkhand?	To map the quality differentials between public and private healthcare facilities in Jharkhand. In addition, the study throws some light on the existence of quality differential in the access and delivery of public and private healthcare facilities in Jharkhand	Literature Survey and Field Work.	Principal Component Analysis, Multiple Regression Analysis, Z Test of Proportions and Sentiment Analysis

3.8 Data Requirements

The study has employed both primary and secondary data sources for analysis. Secondary data has been utilized to examine the current healthcare situation, including basic and specialized healthcare facilities, budget allocation, actual spending, and unmet needs analysis. This is crucial for explaining the necessity of the Public-Private Partnership (PPP) model for delivering healthcare services in Jharkhand. The secondary data has been sourced from various government and non-government entities, including:

1. Department of Health and Family Welfare, Government of India
2. Economic Survey, Government of India
3. Department of Health and Family Welfare, Government of Jharkhand
4. Economic Survey, Government of Jharkhand
5. Patients' Reviews on Social Media

The empirical portion of the study involved data collection through a field survey. The data used for analysis was obtained from a survey conducted among patients and staff of healthcare facilities in the Ranchi district of Jharkhand, India. Ranchi, being the capital of Jharkhand, boasts the largest number of hospitals in the state. The study population focused on private hospitals empanelled under the AB-PMJAY scheme, as public hospitals are inherently mandated to provide services under the scheme.

By exclusively surveying patients who availed services under the scheme, the study aimed to neutralize treatment expenses as a factor when considering public versus private facilities. This approach eliminates cost as a factor for comparing the perceived quality of care across different types of hospitals. With treatment expenses set aside, healthcare providers are then left to compete based solely on the quality of care they deliver.

3.9 Target Population

The study limits the investigation to the cases under the government-run AB-PMJAY scheme as it takes away the cost of consultation or treatment as a factor in choosing between public or private healthcare provider. Also, we study only the Ranchi District of the State of Jharkhand in India. Jharkhand is a peculiar case–a mineral-rich but income-poor state; it also lags amongst the states in India in almost all development parameters. Ranchi district has the highest number of hospitals in Jharkhand and is also the home to its namesake city that is the capital of the state as well.

The 'Ayushman Bharat–Pradhan Mantri Jan Aarogya Yojana' (AB–PMJAY) is the flagship program of the Government of India that aims towards achieving universal health coverage through empanelling hospitals across the country majority of which are private hospitals. Patients registered with the scheme can avail outpatient consultation and in-patient treatment for a long list of specified conditions and diseases, and surgical procedures without having to pay any money to the service provider (Furtado et al., 2022).

All individuals who have ever been to any public or private hospital, in the district of Ranchi, for consultation or treatment (or both) during the last 12 months from the reference period (February–September 2023). All medical, paramedical, and auxiliary services staff working (during the reference period) at public and private hospitals in the district of Ranchi.

3.10 Sampling Strategy

The district of Ranchi was purposefully chosen as the focal point for this study. It comprises two subdivisions, namely Ranchi subdivision and Bundu subdivision, which are further divided into 14 blocks and 4 blocks, respectively. Notably, this district hosts the highest number of hospitals in the state, encompassing all three types, including State Government Hospitals and Private Hospitals, including Not for Profit hospitals. While the presence of state government hospitals in every district is a common occurrence, the significant number of private hospitals in Ranchi is noteworthy. Furthermore, as the capital of the state, Ranchi also features several major super-specialized hospitals equipped with the latest technologies.

According to the Health Management Information System (HMIS) annual report 2019-20, each state health department oversees five types of health facilities, including Sub Centres (SCs), Primary Health Centres (PHCs), Community Health Centres (CHCs), Sub-District Hospitals (SDHs), and District Hospitals (DHs), in addition to Medical Colleges. It is important to note that the number of medical colleges per district is limited or rare. This health facilities pyramid illustrates the institutional structure catering to the population in both rural and urban areas. In the state of Jharkhand, there are three medical colleges as of 2019, and in Ranchi district, there is one district hospital. Additionally, the district boasts 13 community health centres, 18 primary health centres, and 274 sub-centres, as per 2018 data (**Source***: Ministry of Health & Family Welfare,*

Government of India- 2019, Rural Health Statistics 2018-19). The table 3.5 represents the total number of hospitals empanelled in Ayushman Bharat Pradhan Mantri Jan Arogya Yojana in all the districts of Jharkhand.

Table 3.6: *Total number of hospitals empanelled in Ayushman Bharat PM-JAY in all the districts of Jharkhand*

Districts	**No. of Empanelled Hospitals**
Bokaro	53
Chatra	16
Deoghar	35
Dhanbad	56
Dumka	21
East Singhbhum	54
Garhwa	47
Giridh	37
Godda	31
Gumla	17
Hazaribag	47
Jamtara	11
Khunti	12
Kharsawan	32
Koderma	21
Latehar	13
Lohardaga	23
Pakur	16
Palamau	51
Ramgarh	39
Ranchi	146
Sahibganj	12
Simdega	12
West Singhbhum	36
Saraikela	32
Total	**858**

From the total of 146 private and public hospitals empanelled in Ayushman Bharat PM-JAY in Ranchi District, 50 hospitals are considered for study.

To represent the two types of hospitals in the study, cluster sampling was employed. Initially, a comprehensive list of all the different types of hospitals empanelled in AB PM-JAY within the Ranchi district was compiled. The current structure of healthcare providers was then divided into two clusters: Public Hospitals and Private Hospitals.

The survey excluded Primary Healthcare Centres (PHCs), Teaching Colleges, Children's hospitals, and specific disease treatment hospitals. Only Community Healthcare Centres (CHCs), District hospitals, and super speciality hospitals were considered. From the Ranchi district, all 22 public hospitals and 28 private hospitals were purposively selected for the survey. The hospital was selected using hospital mapping, which was conducted to determine the number of other hospitals within a 5 km radius of each selected hospital. Only those private hospitals were selected which had other hospitals within the range. This mapping was necessary to understand the patients' reasons for choosing a particular hospital for their treatment. In some cases, no other hospitals were found within the 5 km range.

Table 3.7: List of selected Hospitals from Ranchi District

Name of the Hospital	**Ownership Type**
Alam Hospital & Research Centre Pvt Ltd.	Private
Amrit Hospital & Research Centre	Private
Anjuman Islamia Hospital Ranchi	Private
Bhagwan Mahavir Medica	Private
Chandra Hospital & Research Centre	Private
Community Health Centre Lapung Ranchi	Private
Dr Lal's Hospital & Research Centre	Private
Dwarika Hospital & Research Centre	Private
Harmu Hospital & Research Centre	Private
Health Point Hospital	Private
Maa Ram Pyari Superspeciality Hospital	Private
Manav Seva Niketan	Private
Medanta Abdur Ranchi	Private
Paras Hec Hospital	Private
Prabhawati Hospital	Private
Pragati Hospital & Research Centre	Private
Raj Hospitals	Private
Raju Seva Sadan	Private
Ranchi Pals Centre	Private
Rani Hospital	Private
RPS Hospital Ranchi	Private
S K Roy Memorial Hospital	Private
Samford Hospital Private Limited	Private

Shree Jagannath Hospital	Private
Shree Superspeciality Hospital	Private
Sparsh Hospital	Private
Sri Shirdi Sai Hospital	Private
Summer Hospital & Research Centre Pvt Ltd.	Private
Vishal Sewa Sadan & Research Centre	Private
Bhagwan Mahavir Medica	Public
Central Hospital Dakra Ranchi	Public
CHC Anagra Ranchi	Public
CHC Bero Ranchi	Public
CHC Burmu Ranchi	Public
CHC Chanho Ranchi	Public
CHC Kanke Ranchi	Public
CHC Mandar Ranchi	Public
CHC Namkum Ranchi	Public
CHC Ormanjhi Ranchi	Public
CHC Ratu Ranchi	Public
CHC Silli Ranchi	Public
CHC Sonahatu Ranchi	Public
CHC Tamar Ranchi	Public
CTC T&IT Hospital CRPF Ranchi	Public
Divisional Railway Hospital Ranchi	Public
Gandhinagar Hospital CCL Ranchi	Public
Jonha Meso Welfare Hospital Ranchi	Public
Sadar Hospital Ranchi	Public
SDH Bundu Ranchi	Public
State Doranda Dispensary Ranchi	Public
Unit Mi Room 133 Bn CRPF Ranchi	Public

3.10.1 Sample Size Determination

To determine the appropriate sample size for a study, various formulas are used depending on the study design, type of data, and specific research objectives. One commonly used formula for calculating sample size is Cochran's formula, which is based on the desired level of

precision, confidence level, and the estimated proportion of the attribute present in the population.

Cochran's formula for sample size determination is:

$$n = \frac{Z^2 p(1-p)}{e^2}$$

Where:

n = sample size, Z = Z-value (e.g., 1.96 for a 95% confidence level), p = estimated proportion of the population with the attribute of interest, e = Desired level of precision (margin of error), expressed as a decimal (e.g., 0.05 for ±5%).

To determine the sample size for a study with a 95% confidence level, a margin of error of ±5%, and an estimated proportion of 0.5 (since the actual proportion is unknown),

Given: Z = 1.96 (for a 95% confidence level), p = 0.5, and e = 0.05, plugging these values into the formula yields:

$$n = \frac{1.96^2 \times 0.5 \times (1-0.5)}{0.05^2}$$

$$= \frac{3.8416 \times 0.25}{0.0025}$$

$$= \frac{0.9604}{0.0025}$$

$$= 384.16$$

3.11 Data Collection

Simple random sampling method was employed to collect data from patients, hospital staffs and doctors of both the Public Hospitals and Private Hospitals. For Sentiment analysis reviews were scraped from Google reviews using web crawler.

3.11.1 For Sample Survey

In each hospital, the HRM personnel was contacted in person to seek permission for conducting the survey by visiting various departments and collecting data from the staff and doctors. During the first visit, 10 questionnaires were distributed to each Head of Department for data collection from the respective doctors and staff. A second visit was conducted after 15 days to collect the previously given questionnaires from the HR department and provide them with another 10 questionnaires to maximize responses from the hospital's doctors and staff. After another 15 days, a third visit was made to collect the second set of 10 questionnaires from various departments through the HR Department. This process was repeated for all 50 hospitals

included in the survey. In total, 138 responses from Public Hospitals and 201 responses from Private Hospitals were collected.

Patient samples from the 50 surveyed hospitals were collected through simple random sampling method to eliminate the selection bias. To collect responses from patients, permissions were first obtained from the hospital management and then from the family members. Patients were approached individually for recording their responses at the OPD. A total of 194 patients were surveyed from Public Hospitals, while 243 patients were surveyed from Private Hospitals.

3.11.2 For Sentiment Analysis

The workflow for sentiment analysis is presented in figure-3.2

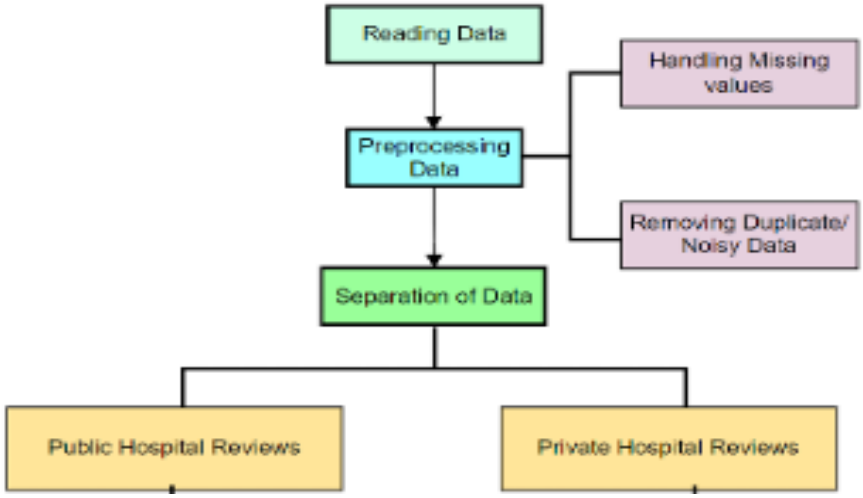


Figure 3.2: *Workflow of Sentiment Analysis*

Data was collected from Google review using web crawler where patients have left feedback about their experiences with both public and private hospitals. The dataset includes text reviews, ratings, and metadata such as hospital type (public or private), date of review, and reviewer demographics where available. The collected data was read into a suitable environment for analysis in R Studio.

3.11.3 Instrument

Two separate structured questionnaires–for patients and medical staff–were used; they comprised 24 and 1 statements, respectively, based on indicators derived from the literature (Table–3 and Table–4). The patient survey questionnaire comprised, apart from inquiries into the socio-economic background of the patients, statements regarding healthcare service experiences to which they had to indicate their degree of agreement or disagreement. Similarly, the questionnaire directed towards the hospital staff contained statements about various aspects such as the available amenities, adequate staffing, staff proficiency, patient safety, feedback, and operational efficiency.

3.12 Stages of Survey

Survey was conducted in two stages: (i) pilot survey and (ii) main survey.

3.12.1 Pilot Survey

A pilot survey was conducted at the first stage on patients and hospitals in the month of February 2023. Pre-test of the survey was conducted in one of the randomly selected sample hospitals, namely Summer Hospital and Research Centre in Ranchi district and a total of 100 responses were collected including both staffs and patients. Table 3.7 and 3.8 represents the validity of patient's and staff's data.

A. Patients' Data

***Table 3.8**: Validity of Patients' Data*

	Cronbach's α	McDonald's ω
Scale	0.887	0.896

B. Staff's Data

***Table 3.9**: Validity of staff's Data*

	Cronbach's α	McDonald's ω
scale	0.833	0.808

This pre-test greatly helped in understanding the culture, environment and the details of the hospital, hospital authority as well as the health care consumers. It also helped to redesign and modify the questionnaires. After analysing the feedback obtained from the pre-test, necessary corrections and modifications to the questionnaires were made. These revisions involved rephrasing certain questions to enhance clarity, adding, or removing specific questions to gather more relevant information, and adjusting response options to encompass a broader range of scenarios. These changes were significant and aimed to improve the overall effectiveness and accuracy of the questionnaires.

Furthermore, a second pre-test was conducted at the same hospital, involving a predetermined number of patients (57) and hospital staff members (43). This additional round of testing served as a validation process to ensure that the revised questionnaires addressed any identified issues and were well-suited for the main survey.

3.12.2 Main Survey

The second stage of the survey was conducted from April 2023 to September 2023, making the reference period of the survey February 2023 to September 2023.

A simple random sampling technique was used to collect data from hospital staff and doctors at Public and Private hospitals. To obtain permission for conducting the survey, HRM

personnel at each hospital were approached directly. This involved visiting various departments to gather data from staff and doctors. Initially, 10 questionnaires were distributed to each Department Head for data collection from their teams. A follow-up visit, 15 days later, involved the collection of these questionnaires and the distribution of another set of 10, to maximize response rates. This process, including a second collection of questionnaires after another 15 days, was replicated across all 50 hospitals in the study. In total, 137 responses were gathered from Public Hospitals, and a total of 201 responses from private hospitals.

A simple random sampling was employed for patient data collection from the 50 hospitals. With hospital management's approval, patient responses were sought, followed by consent from family members. Out-Patients were approached individually in the Outpatient Department (OPD).

The survey encompassed a total of 194 patients from Public Hospitals and 243 from Private and Not-for-Profit hospitals, including both In-Patients and Out-Patients.

3.13 Data Analysis Tools

3.13.1 Scale

Responses were collected on 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Some statements in both questionnaires are worded negatively, and were recoded (reflected) so that one always represents lowest degree of agreement with the statement and five the highest degree.

Table 3.10: *Likert Scale*

Scale	Value
Strongly Disagree	1
Disagree	2
Uncertain	3
Agree	4
Strongly Agree	5

3.13.2 Quantitative Analysis

The statistical procedure used in the study to estimate the quality differential in the healthcare delivery by the public hospital and private hospital can be described as follows:

1. Principal Component Analysis (PCA) is a widely used statistical technique for dimensionality reduction and data exploration. It is an unsupervised learning method that aims to transform a high-dimensional dataset into a lower-dimensional space while retaining most of the important information. PCA identifies the principal components, which are new variables that are linear combinations of the original variables, ordered by the amount of variance they explain in the data.

The main goal of PCA is to find a new set of orthogonal (uncorrelated) variables, called principal components, that capture the maximum amount of variance in the data. The first principal component accounts for the largest possible variance, and each succeeding component accounts for the highest possible remaining variance, under the constraint that it is orthogonal to the preceding components. This process allows for the reduction of the data's dimensionality by focusing on the most informative components. PCA works by performing an eigen decomposition of the data's covariance matrix or a singular value decomposition of the centered data matrix. The eigenvectors of the covariance matrix represent the directions of the principal components, while the corresponding eigenvalues indicate the amount of variance explained by each component. By selecting a subset of the top principal components, one can effectively reduce the dimensionality of the data while minimizing information loss.

It is important to note that PCA is sensitive to the scaling of the original variables, so it is often recommended to standardize the data before applying PCA. Additionally, the interpretation of the principal components may not always be straightforward, as they are linear combinations of the original variables.

In summary, Principal Component Analysis is a powerful tool for dimensionality reduction, data visualization, and feature extraction. It helps in understanding the underlying structure of complex datasets and can be used as a preprocessing step for various machine learning tasks.

2. A multiple linear regression model is a statistical approach used to model the relationship between a dependent variable and one or more independent variables. It assumes a linear relationship between the variables, meaning that the change in the dependent variable is directly proportional to the change in the independent variable(s). The general form of a multiple linear regression model can be expressed as:

$$Y = \beta_0 + \beta_1 X_2 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon$$

Where: Y is the dependent variable (also known as the response variable or target variable), $X_1, X_2, \ldots, X_n$ are the independent variables (also known as predictor variables or features). $\beta_0, \beta_1, \beta_2, \ldots, \beta_n$ are the coefficients (also known as regression coefficients or weights) that represent the relationship between the independent variables and the dependent variable, and ε is the error term, representing the random variation or noise in the relationship.

The goal of multiple linear regression is to estimate the values of the coefficients that minimize the difference between the predicted values and the actual values of the dependent variable. This is typically done using a method called ordinary least squares (OLS), which minimizes the sum of the squared differences between the predicted and actual values. Once the coefficients are estimated, the multiple linear regression model can be used to make predictions on new data by plugging in the values of the independent variables. It can also be used to analyse the strength and significance of the relationships between the variables, as well as to identify the most influential predictors. The R value and R-squared value are both measures of the goodness of fit of a regression model. The R value, also known as the correlation coefficient, measures the strength and direction of the linear relationship between the dependent variable and the independent variable(s). It ranges from -1 to 1, where -1 indicates a perfect negative correlation, 0 indicates no correlation, and 1 indicates a perfect positive correlation. The R-squared value, also known as the coefficient of determination, measures the proportion of the variance in the dependent variable that is explained by the independent variable(s). It ranges from 0 to 1, where 0 indicates that none of the variance is explained by the independent variable(s), and 1 indicates that all the variance is explained by the independent variable(s). Multiple Regression Analysis is calculated from the Perceived Quality Score.

3. The Z-test of proportions is a statistical hypothesis test used to compare the proportions of two independent groups or to compare a sample proportion to a known population proportion. It is based on the assumption that the sample size is large enough (typically, $n > 30$) and that the sample is randomly selected from the population. The test statistic follows a standard normal distribution (Z-distribution) under the null hypothesis. The null hypothesis (H_0) in a Z-test of proportions states that there is no significant difference between the two proportions being compared. The alternative hypothesis (H_1) can be two-sided (the proportions are not equal) or one-sided (one proportion is greater or less than the other). To conduct the test, the sample proportions (p_1 and p_2) are calculated from the data, and the pooled proportion (p) is computed as the weighted average of the sample proportions. The test statistic (Z) is then calculated using the formula:

$$Z = \frac{p_1 - p_2}{\sqrt{p(1-p)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Where: p_1 and p_2 are the sample proportions, n_1 and n_2 are the sample sizes, and p is the pooled proportion.

The calculated Z-value is then compared to the critical Z-value determined by the chosen significance level (α) and the type of alternative hypothesis (two-tailed, left tailed, or right-tailed). If the absolute value of the calculated Z is greater than the critical Z, the null hypothesis is rejected, and we conclude that there is a significant difference between the proportions. Otherwise, if the calculated Z falls within the acceptance region, we fail to reject the null hypothesis and conclude that there is not enough evidence to suggest a significant difference between the proportions.

It is important to note that the Z-test of proportions assumes that the samples are independent and that the sample size is large enough to approximate a normal distribution. If these assumptions are violated, alternative tests such as the chi-square test or Fisher's exact test may be more appropriate. Additionally, the Z-test of proportions is sensitive to small differences in large sample sizes, so it is crucial to consider the practical significance of the results in addition to the statistical significance.

4. Perceived Quality Score: The perceived quality score (PQS) is the weighted average response of patients' weights being the square of the factor loadings extracted using principal component analysis of the patient survey data. Following multiple linear regression model is used to calculate Perceived Quality Score for determining the Quality of Care from patients' perspective:

$$y_{ij} = \alpha_0 + \beta h_{ij} + \boldsymbol{X'}_i \boldsymbol{\gamma}_0 + \boldsymbol{H'}_j \boldsymbol{\delta} + \varepsilon_{\boldsymbol{ij}}$$

Where: y_{ij} = perceived quality score, h_{ij} = dummy variable for hospital type (private = 1), $\boldsymbol{X'}$ = patient characteristics, and $\boldsymbol{H'}$ = hospital characteristics.

5. Trend analysis is a statistical technique used to identify and examine patterns or trends in data over time. It involves collecting and analysing historical data to make predictions or decisions about future events or behaviours. Trend analysis is widely used in various fields, such as finance, economics, marketing, and social sciences, to understand how variables change over time and to make informed decisions based on these patterns.

The main goal of trend analysis is to identify the underlying direction or tendency of a variable of interest, such as sales, prices, or customer behaviour. This is typically done by plotting the data on a graph, with time on the x-axis and the variable of interest on the y-axis. The resulting visual representation allows analysts to identify

patterns, such as increasing, decreasing, or cyclical trends, as well as any irregularities or anomalies in the data.

Trend analysis is a powerful tool for understanding the past behaviour of a variable and making predictions about its future performance. But it's crucial to take into account trend analysis's drawbacks, like the potential for outside influences to skew the patterns that are seen and the chance that previous trends won't hold true in the future. For the most accurate and trustworthy conclusions, trend analysis should also be combined with other analytical methods and subject-matter knowledge.

The above statistical procedures are used in the study for comparing the quality of healthcare delivery by public and private hospitals. The procedures discussed include Principal Component Analysis (PCA), Multiple Linear Regression, Z-test of proportions, Perceived Quality Score (PQS), and Trend Analysis.

3.13.3 Qualitative Analysis

Sentiment analysis, also known as opinion mining, is a process of determining the emotional tone or sentiment behind a piece of text. The main approaches used in sentiment analysis include rule-based methods that identify and score specific keywords based on predetermined lexicons, automatic methods that use machine learning algorithms trained on labeled datasets, and hybrid methods that combine both techniques. Sentiment analysis has valuable applications in brand reputation management, voice of customer analysis, market research, and politics. By objectively measuring and tracking customer perceptions at scale, sentiment analysis enables companies to quickly respond to customer needs, emerging trends, and potential crises.

3.14 Summary

In this chapter, the comprehensive approach taken to assess healthcare quality in Ranchi district, Jharkhand. The chapter highlights the pilot survey conducted in February 2023 to refine questionnaires, followed by the main survey from April to September 2023. Data analysis techniques such as PCA, Z Test of Proportions, Multiple Linear Regression, descriptive statistics, trend analysis, sentiment analysis and χ^2 tests were utilized to evaluate the quality of public and private hospitals under AB PM-JAY. The study incorporated data from secondary sources like Economic Surveys and NFHS reports, along with primary data from field surveys, to analyze trends in healthcare services and government expenditure. Additionally, the assessment of the need for Public-Private Partnership (PPP) models in Jharkhand was a key focus. By establishing benchmarks and frameworks, the study aimed to compare and map quality differentials between public and private healthcare facilities. The chapter also references various studies and researchers in the field of healthcare quality assessment.

CHAPTER IV
RESULTS, ANALYSES AND INTERPRETATIONS

Chapter 4 | RESULTS, ANALYSES AND INTERPRETATIONS

4.1 Introduction

This study employed a mixed methods approach, combining both qualitative and quantitative data collection and analysis techniques. The primary data gathering phase occurred between February and September 2023. For the quantitative portion, several statistical methods were utilized, including Principal Component Analysis, Z test of proportions, Multiple Regression Analysis and Sentiment Analysis. Perceived Quality Score was also calculated.

The analysed data is presented in two main sections: descriptive data analysis and interpretation, making use of tables and graphs to visualize the findings, and detailed data analysis to draw insights and conclusions. Descriptive statistics provide a summary of the key characteristics and trends in the data, while the detailed analysis delves deeper to uncover relationships, patterns, and differences. By combining qualitative and quantitative methods, this study aims to provide a comprehensive and rigorous investigation of the research questions. The mixed methods approach allows for both breadth and depth of understanding, with the qualitative data providing rich context and the quantitative data enabling generalization and prediction.

4.2 Data Descriptive

Data description involves presenting a succinct summary of a dataset by using descriptive statistics to emphasize key characteristics. This process provides insights into the data's nature and structure, enabling further analysis and informed decision-making. The descriptive summary serves as a foundation to guide subsequent analytical processes and support evidence based decision-making.

4.2.1 Healthcare Facilities and Infrastructure in Jharkhand

Jharkhand, a state in India, had a total population of 32.9 million. Among them, 16.9 million were males, and 16.1 million were females. The state covers an area of 79,716 square kilometres, with a population density of 414 persons per square kilometre (higher than the national average). Jharkhand's literacy rate stood at 66.41%**,** with male literacy at 76.84% and female literacy at 55.42%**.** The sex ratio (number of females per 1000 males) in Jharkhand was 948, surpassing the national average of 943. Even the child sex ratio (age less than 6 years) was higher in Jharkhand at 948 compared to India's 918. Out of the total population, 13.1 million individuals were engaged in work activities. 52.1% described their work as main work (employment or earning for more than 6 months), while 47.9% were involved in marginal activities (providing livelihood for less than 6 months). Main workers included cultivators**,**

agricultural labourers, and other workers. Jharkhand's urban population constituted 24.05%, while 75.95% resided in rural areas. Urban literacy rate stood at 82.26%, with male literacy at 88.44% and female literacy at 75.47%. These statistics provide a comprehensive overview of Jharkhand's demographic and social landscape.

Table 4.1: *Reflections on Key Health Indicators – Jharkhand*

Patient Service[9]	Jharkhand	India
IPD per 1000 population	20.4	62.6
OPD per 1000 population	436.0	1337.1
Operation (surgeries) major (General and Spinal Anaesthesia) per 10000 population	22.8	36.4

Indicators	Numbers (Total)
Number of District Hospitals[2]	23
Number of Sub District Hospital[2]	13
Number of Government (Central + State) Medical College[6]	7
Number of Private (Society + Trust) Medical Colleges[6]	0

Number of AB-HWCs functional as of 22nd December 2021[16]	Status (Total)	Target FY (2020-21)	Target FY (2021-22)	Target FY (2022-23)
SHC-HWC	1413	1479	2534	3237
PHC-HWC	178	298	298	298
UPHC-HWC	54	59	59	59
Total-HWC	**1645**	**1836**	**2891**	**3594**

Rural[2]	Required (R)	In place (P)	Shortfall (S) (%)
Number of Community Health Centres (CHC)	272	171	37.13
Number of Primary Health Centres (PHC)	1,091	291	73.33
Number of Sub Centres (SC)	6,848	3,848	43.81
Number of functional First Referral Units (FRUs)	DH	SDH	CHC
	23	11	39
Urban[2]	**Required (R)**	**In place (P)**	**Shortfall (S) (%)**
Number of PHC	196	60	69.39
Tribal[2]	**Required (R)**	**In place (P)**	**Shortfall (S)%**
Number of CHC	111	103	7.21
Number of PHC	444	175	60.59
Number of SC	2,963	2,462	16.91

Ayushman Bharat – Health and Wellness Centres (AB-HWCs) (**Source:** Health Dossier 2021)

The table presented above offers a comprehensive analysis of the public healthcare infrastructure in Jharkhand, focusing on the availability of basic and specialized healthcare centers. The data highlights the discrepancy between the required number of facilities and the actual shortfall in both rural and tribal areas of the state. The most significant shortfall is observed in Community Health Centres (CHCs), with a deficit of 37.13% in rural areas and

7.21% in tribal regions. This shortage of CHCs indicates a pressing need for the establishment of more specialized healthcare facilities to cater to the population's needs effectively.

Furthermore, the Inpatient Department (IPD) and Outpatient Department (OPD) per 1000 population in Jharkhand are notably lower compared to the national average. This disparity suggests that the state's healthcare system may be overburdened, and there is a requirement for increased capacity to provide adequate medical services to the populace.

Table 4.2: *Information on total number of households and eligible households under ABPMJAY in each State*

Region	Districts	Private Hospitals	Share in Total Number of Eligible Households under AB-PMJAY
Jharkhand	24	414	2.70%
India	640	15421	100.00%

Source: *Insurance Information Bureau (IIB) of India for number of private hospitals across States and districts (https://www.pmjay.gov.in/state)*

Despite these challenges, Jharkhand has seven Government Medical Colleges, which play a crucial role in training healthcare professionals and providing advanced medical care to the population. However, the presence of these colleges alone may not be sufficient to bridge the gap in the state's healthcare infrastructure. The analysis of Jharkhand's public healthcare infrastructure reveals significant shortfalls, particularly in rural and tribal areas. Addressing these deficits through targeted investments and policies is essential to ensure equitable access to healthcare services for all residents of the state.

Jharkhand boasts a robust network of 414 esteemed private hospitals, including those empanelled under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme, as per the data provided by the Insurance Information Bureau (IIB) of India. These healthcare establishments offer specialized care for a wide array of medical conditions, catering to the diverse needs of the population. The private healthcare infrastructure in Jharkhand comprises a comprehensive range of facilities, including trauma centres, rehabilitation facilities, paediatric hospitals, and geriatric care centres. These specialized institutions are equipped to provide targeted treatments tailored to specific health requirements, such as psychiatric care and disease-specific interventions. By offering focused care, these hospitals contribute significantly to the overall healthcare ecosystem in the state.

However, it is noteworthy that despite the presence of a substantial number of private hospitals, Jharkhand currently lacks private medical colleges. The absence of such institutions

may have implications for the state's ability to train and retain a sufficient number of healthcare professionals to meet the growing demand for specialized medical services.

Table 4.3: *Reflections on Key Health Indicators – Jharkhand*

HRH Distribution	Sanctioned	In Place
Doctors (MO & specialists) to staff nurse[14]	1:1/2	1:1/2
Availability of public healthcare providers (MO, specialists, staff nurse & ANM) in district healthcare system[14]	6 per 10,000	3 per 10,000
Regular to contractual service delivery staff ratio[14]	1:1	1:1

Source: *Health Dossier 2021*

The figure presented above provides valuable insights into the current state of human resources for health in Jharkhand. It highlights the sanctioned and in-place ratios of service delivery staff and the ratio of doctors to staff nurses, which are crucial indicators of the healthcare system's capacity to meet the population's needs.

One of the most striking observations is that the sanctioned ratio of service delivery staff to the population is 1:1, and the in-place ratio also stands at 1:1. This suggests that the state has been successful in ensuring an adequate number of healthcare professionals are deployed to serve the population. The 1:1 ratio indicates that, on average, there is one service delivery staff member available for every individual in the state, which is a commendable achievement in terms of healthcare accessibility.

Furthermore, the doctor-to-staff nurse ratio in Jharkhand is reported to be 1:1/2, implying that for every doctor, there are 1.5 staff nurses available. This ratio is of particular significance as it highlights the importance of a balanced healthcare workforce. Staff nurses play a critical role in providing patient care, administering treatments, and supporting doctors in various medical procedures. The 1:1/2 ratio suggests that Jharkhand has a relatively well-distributed workforce, with a sufficient number of staff nurses to complement the doctors in delivering quality healthcare services.

However, it is essential to consider that these ratios represent an average across the state and may not reflect the variations in the distribution of healthcare professionals across different regions, particularly between urban and rural areas. Further analysis of the geographical distribution of healthcare workers would provide a more comprehensive understanding of the accessibility and quality of healthcare services in Jharkhand.

Therefore, the analysis of human resources for health in Jharkhand reveals a positive scenario, with the sanctioned and in-place ratios of service delivery staff standing at 1:1 and a doctor-tostaff nurse ratio of 1:1/2. These figures indicate the state's commitment to ensuring an

adequate and well-distributed healthcare workforce. Nevertheless, it is crucial to continue monitoring and addressing any disparities in the distribution of healthcare professionals to ensure equitable access to quality healthcare services for all residents of Jharkhand.

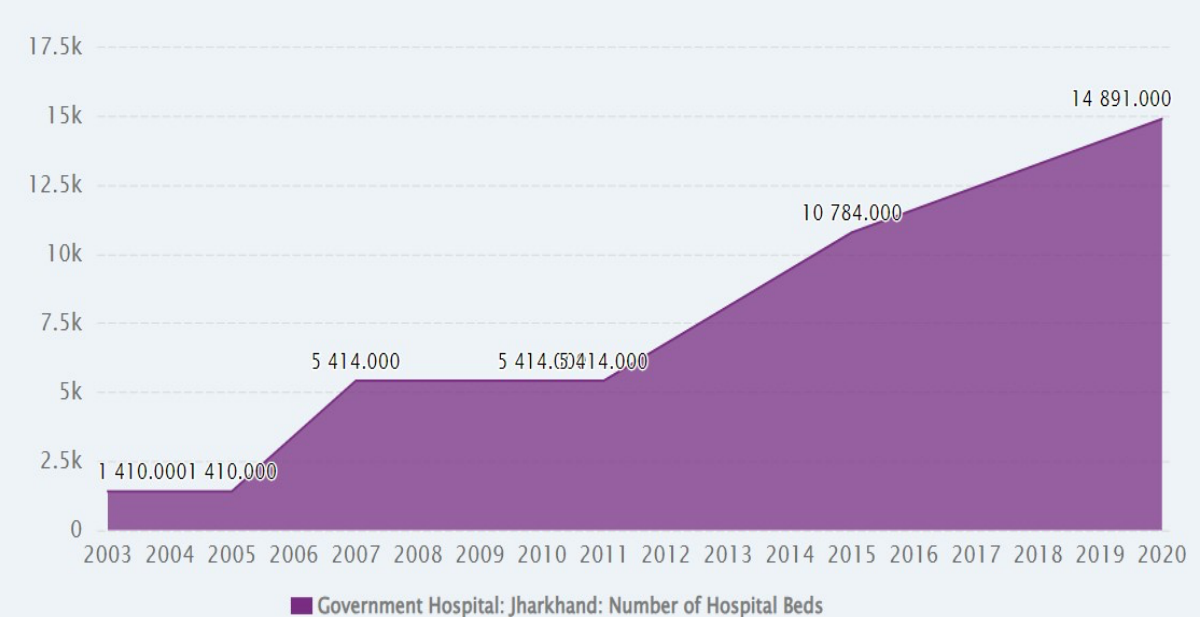


Figure 4.1: *Change in the Number of Beds* (**Source:** www. CIECDATA.com, Central Bureau of Health Intelligence)

The graphical representation of hospital bed availability in Jharkhand over a 17-year period, from 2003 to 2020, reveals a consistent positive trend. This upward trajectory is indicative of the state's concerted efforts to enhance its healthcare infrastructure and improve patient care capacity.

In 2003, the baseline year for this analysis, the number of hospital beds available in Jharkhand was comparatively low, with an estimated count of around 5,000. This figure highlights the initial challenges faced by the state in terms of providing adequate medical facilities to cater to the healthcare needs of its population.

However, over the course of the subsequent 17 years, Jharkhand witnessed a remarkable growth in the availability of hospital beds. By 2020, the culmination of this study period, the number of beds had surged to approximately 17,500. This substantial increase, representing a more than three-fold growth, underscores the state's dedication to strengthening its healthcare system and expanding its capacity to deliver quality medical services.

The observed growth in hospital bed availability has far-reaching implications for the overall healthcare landscape in Jharkhand. With a larger number of beds, healthcare facilities are better equipped to accommodate patients, reduce waiting times, and provide timely medical interventions. This enhancement in infrastructure directly contributes to improved patient outcomes, as it allows for more efficient diagnosis, treatment, and post-operative care.

Furthermore, the increased availability of hospital beds is a testament to the state's investment in healthcare infrastructure development. This growth suggests a prioritization of resource allocation towards the establishment of new medical facilities, expansion of existing hospitals, and upgrading of medical equipment and technology. Such investments are crucial in ensuring that the healthcare system can effectively respond to the evolving needs of the population and tackle emerging health challenges.

4.2.2 Trends in Government Expenditure on Healthcare Services in Jharkhand

A. Healthcare Expenditure as Percentage of SGDP in Jharkhand

The data illustrates the temporal evolution of Jharkhand's economic growth rate from the fiscal year 2013-14 to the projected figures for 2023-24. This analysis aims to shed light on the state's economic performance over the past decade and its implications for the future.

From 2013-14 to 2019-20, Jharkhand's healthcare expenditure growth rate exhibited a steady upward trend, increasing from 3.70% to 4.85%. This consistent growth can be attributed to various factors, such as the state's focus on infrastructure development, attracting investments, and implementing policies to foster industrial growth. The gradual increase in the growth rate during this period indicates the state's resilience and ability to maintain economic stability.

However, the fiscal year 2020-21 marked a significant shift in Jharkhand's economic trajectory. The growth rate surged to 5.31%, defying the challenges posed by the COVID-19 pandemic. This remarkable performance can be attributed to the state's proactive measures to support businesses, ensure the continuity of essential services, and provide relief to vulnerable sections of society.

The projected growth rates of healthcare expenditures for the subsequent years, 2021-22 to 2023-24, showcase an even more impressive upward trend. The state's economy is expected to grow at 8.55% in 2021-22, 9.57% in 2022-23, and reach an impressive 9.80% in 2023-24.

These projections indicate Jharkhand's strong economic fundamentals and its potential to emerge as a leading contributor to India's overall economic growth.

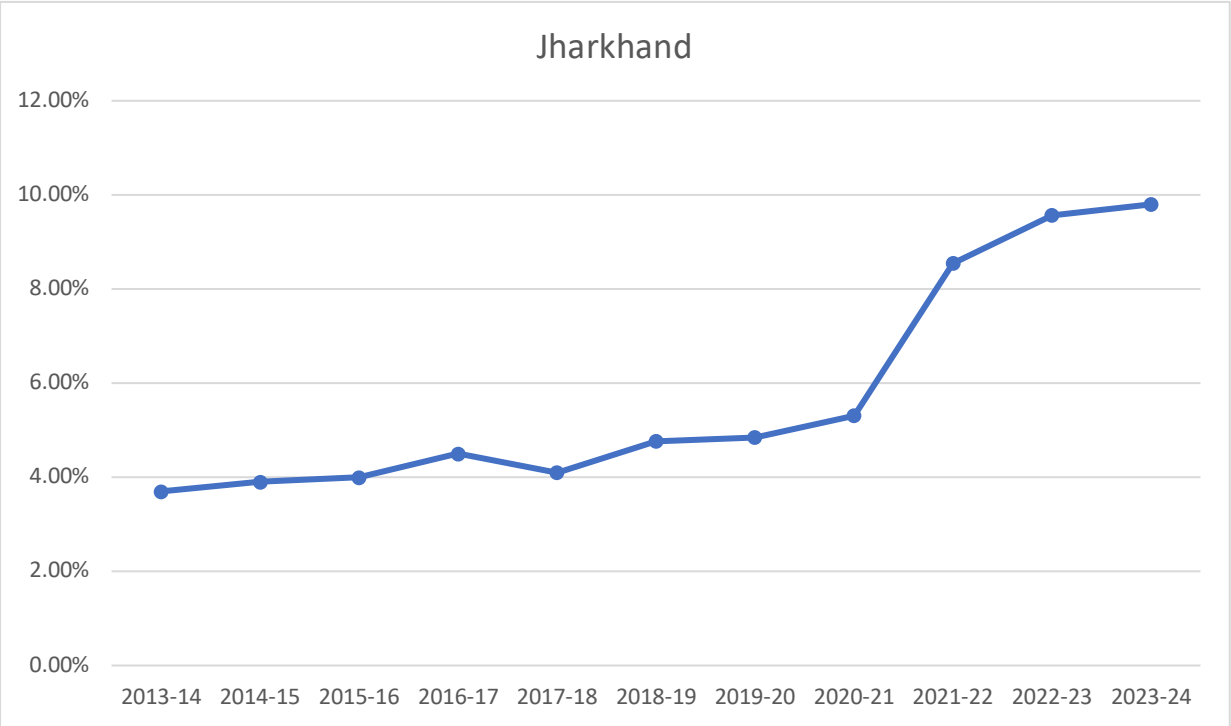


Figure 4.2: *Healthcare Expenditure as Percentage of SGDP in Jharkhand* ***(Source:*** *National Health Accounts, MoHFW)*

B. Expenditure under AB-PMJAY in Jharkhand

In September 2018, the Indian government introduced the Ayushman Bharat-Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), a flagship health insurance program. Targeting over 10.74 crore poor and vulnerable families (approximately 50 crore beneficiaries), who make up the bottom 40% of the Indian population, the scheme offers a health cover of Rs. 5 lakh per family per year for secondary and tertiary care hospitalization in an effort to provide financial protection to vulnerable families. The application of AB-PMJAY has advanced significantly in Jharkhand. 8,992,890 Ayushman cards have been issued by the state as of 2021, allowing recipients to receive cashless care at hospitals that have been empanelled. Jharkhand has recorded 867,385 authorized hospital admissions under the scheme, with a total value of Rs. 8,767,034,692 (Economic Survey Jharkhand, 2018-19), demonstrating the scheme's extensive reach and its impact on providing accessible healthcare to the underprivileged.

A nationwide network of hospitals that have been empanelled under the AB-PMJAY program is essential to its success; as of July 20, 2021, over 23,300 institutions had been approved by state and union territory governments. After completing a verification process at PMJAY kiosks, beneficiaries receive their Ayushman cards, which they can use to receive cashless care at these institutions. In addition to the insurance component, AB-PMJAY also focuses on strengthening primary healthcare through the establishment of Health & Wellness Centres (HWCs). The central government allocated funds to Jharkhand for HWCs, with Rs.

26.02 crore in 2018-19 and Rs. 75.81 crore in 2019-20, although no allocation was made in 2020-21 (Economic Survey Jharkhand, 2018-19).

Jharkhand has made commendable progress in terms of financial and physical implementation of AB-PMJAY. In the financial year 2018-19 (up to October), the state was allocated Rs. 202.12 crore for the implementation of the scheme and utilized Rs. 187.12 crore, which is an impressive 92.6% of the allocated funds. The physical progress of AB-PMJAY in Jharkhand is measured by the number of families entitled to avail benefits under the scheme. The state had a target to cover 57,10,933 families from September 23, 2018, onwards, and remarkably, Jharkhand achieved this target, ensuring that all the targeted families were entitled to receive healthcare benefits under AB-PMJAY.

While the implementation of AB-PMJAY in Jharkhand has the potential to significantly improve access to quality healthcare for the economically disadvantaged population and reduce out-of-pocket expenditure, challenges remain in ensuring the scheme's effective implementation. These include increasing awareness among beneficiaries, strengthening the network of empanelled hospitals, and ensuring timely reimbursement to healthcare providers. Addressing these issues will be crucial for the long-term success of AB-PMJAY in Jharkhand and its ability to provide comprehensive healthcare coverage to the targeted population.

In conclusion, AB-PMJAY has made substantial progress in Jharkhand, with a large number of Ayushman cards issued and hospital admissions authorized. The scheme's success relies on the continued expansion of the empanelled hospital network and the effective utilization of allocated funds for HWCs. By overcoming implementation challenges, Jharkhand can further enhance the impact of AB-PMJAY in providing accessible and affordable healthcare to its vulnerable population.

4.2.3 Need of adoption of PPP mode in the healthcare sector in Jharkhand

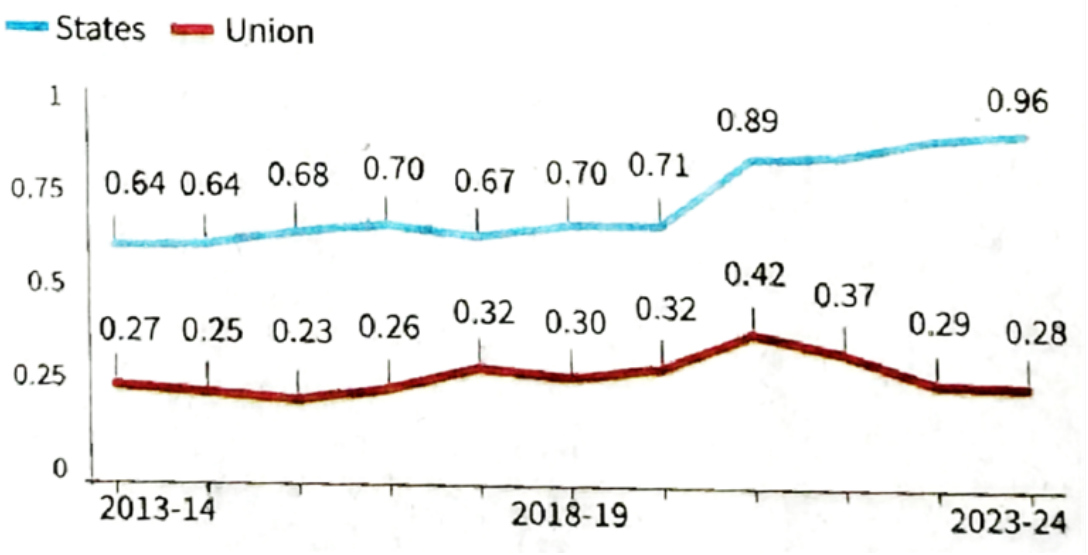


Figure 4.3**: The Union and State Government's Spending on Health as a % of GDP* (Source:*** *The Hindu, 15th May 2024)*

Public-Private Partnerships (PPPs) have emerged as a promising approach to address the challenges faced by the healthcare sector in Jharkhand. The state, like many others in India, grapples with issues such as inadequate infrastructure, shortage of skilled healthcare professionals, and limited access to quality healthcare services, particularly in rural and remote areas. Assessing the need for adopting the PPP mode in Jharkhand's healthcare sector is crucial to understanding how this collaborative approach can help bridge the gaps and improve the overall health outcomes of the population.

C. Out of Pocket Expenditure in Jharkhand

The table presents the percentage of total health out-of-pocket expenditure for India and the state of Jharkhand from 2013-14 to 2019-20. In 2013-14, India's percentage of total health out of-pocket expenditure was 64.2%. Subsequently, India's percentage decreased to 62.6% in 2014-15, 60.6% in 2015-16, 58.7% in 2016-17, 48.8% in 2017-18, 48.2% in 2018-19, and 47.1% in 2019-20. Conversely, Jharkhand's percentage was 66.3% in 2014-15 and 2015-16, 66% in 2016-17, 68.7% in 2017-18 and 2018-19, and 64.7% in 2019-20. Overall, the data reflects a consistent decrease in the percentage of total health out-of-pocket expenditure for India over the years, while Jharkhand's percentage has exhibited fluctuations, with a general increase from 2016-17 to 2018-19. These trends may be influenced by factors such as changes in healthcare policies, economic conditions, and public health initiatives. Further analysis is necessary to discern the underlying causes of these patterns.

The observed trends in the percentage of total health out-of-pocket expenditure for India and Jharkhand from 2013-14 to 2019-20 have significant economic implications, particularly in the context of the need for Public-Private Partnerships (PPP) in Jharkhand. As the percentage

of total health out-of-pocket expenditure has shown fluctuations and a general increase in Jharkhand, there is a potential indication of a higher reliance on private funding for healthcare in the state. This underscores the importance of exploring PPP models to enhance the accessibility and affordability of healthcare services. PPPs can play a crucial role in addressing the economic challenges associated with healthcare provision by leveraging private sector resources and expertise to improve infrastructure, service delivery, and overall healthcare outcomes. Additionally, PPPs can contribute to the development of sustainable healthcare financing mechanisms, which are essential for reducing the burden of out-of-pocket expenditure on individuals and promoting inclusive access to quality healthcare services. The utilization of PPPs in Jharkhand's healthcare sector could potentially lead to improved healthcare infrastructure, enhanced service delivery, and better health outcomes for the population, aligning with the broader economic development goals of the state.

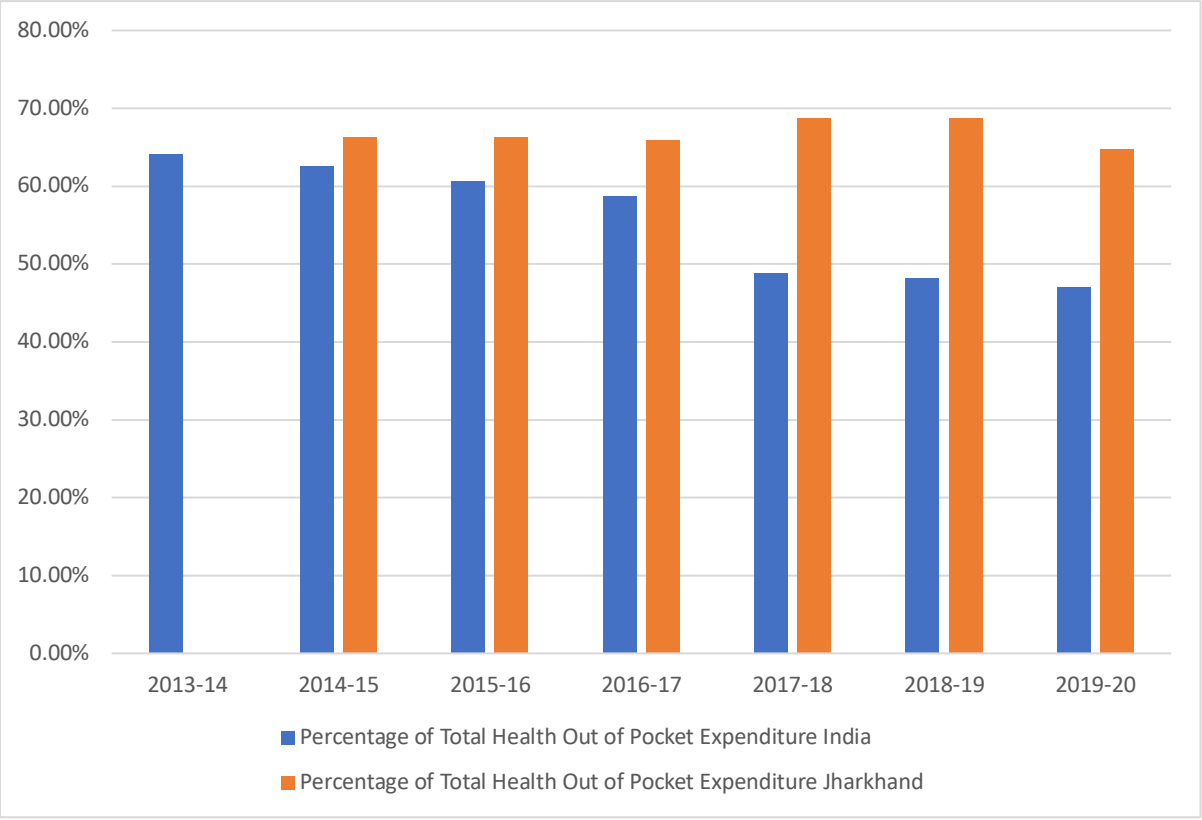


Figure 4.4: *Percentage Out of Pocket Expenditures (**Source:** National Health Accounts, MoHFW)*

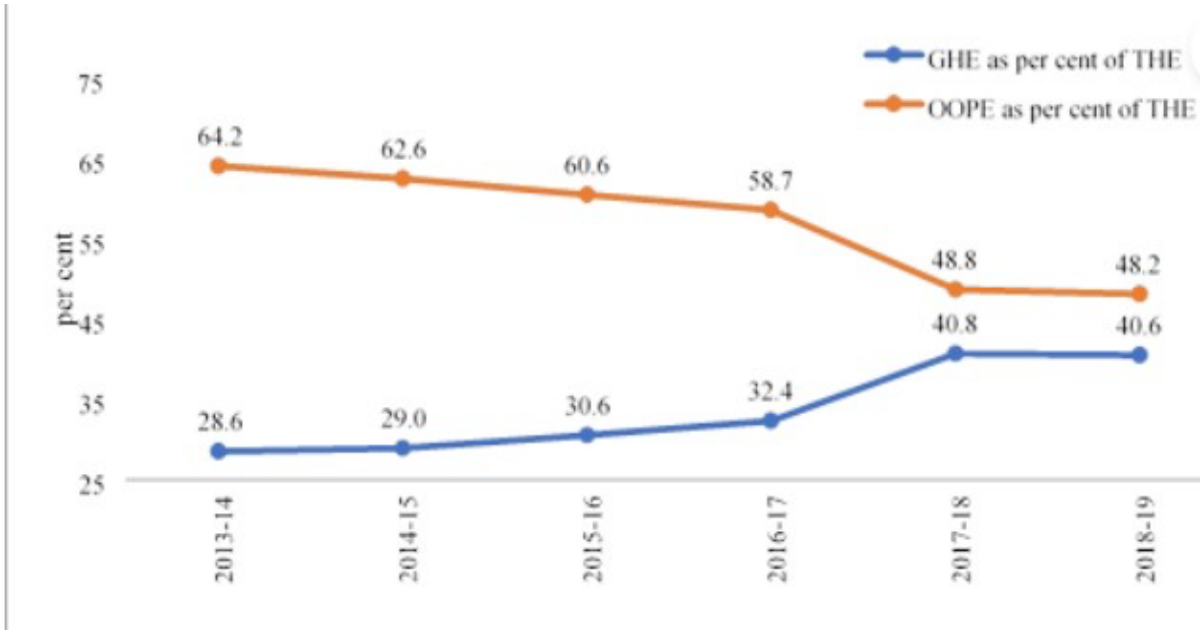


***Figure 4.5**: Government Health Expenditure (GHE) and Out of Pocket Expenditure (OOPE) as per cent of Total Health Expenditure (THE) (**Source:** The Hindu, 15th May 2024)*

The economic implications of the observed trends in healthcare expenditure underscore the potential benefits of implementing PPPs in Jharkhand's healthcare sector. By leveraging private sector resources and expertise, PPPs can contribute to the development of sustainable healthcare financing mechanisms, improved infrastructure, and enhanced service delivery, ultimately leading to better health outcomes for the population.

D. Unmet Needs in Jharkhand

Jharkhand faces significant unmet needs in family planning, with a high percentage of married women lacking access to modern contraceptive methods. This leads to unintended pregnancies, maternal health risks, and socio-economic challenges. To address these unmet needs, Public Private Partnerships (PPPs) can play a crucial role. By collaborating with private healthcare providers, NGOs, and community organizations, the government can expand the reach of family planning services, improve the quality of care, and promote awareness about contraceptive options. PPPs can help bridge the gap in service delivery, particularly in rural and remote areas, by leveraging the expertise and resources of private partners. Moreover, PPPs can foster innovation in family planning service delivery, such as the introduction of telemedicine and mobile clinics, to reach underserved populations. By addressing the unmet needs in family planning through PPPs, Jharkhand can work towards improving maternal and child health outcomes, empowering women, and promoting sustainable development in the state.

The data compares the projected and actual number of acceptors for spacing and limiting methods in Jharkhand and India from 2011 to 2022. Spacing methods refer to family planning techniques used to space out pregnancies, while limiting methods are used to permanently prevent pregnancies. In Jharkhand, the actual number of acceptors for spacing methods in 2011 was 0.55, which matched the projected figure. However, the actual growth rate was slower than anticipated, with the 2022 actual figure (0.91) being significantly lower than the projected 1.23. On the other hand, Jharkhand's actual growth rate for limiting methods outperformed the projections, with the actual figure increasing from 0.13 in 2011 to 0.23 in 2022. In India, the actual number of acceptors for spacing methods in 2011 (31.04) aligned with the projection. However, the actual growth rate was slower than expected, with the 2022 actual figure (41.70) being higher than the projected 37.92. For limiting methods, India's actual figures were slightly lower than the projections, with the actual number increasing from 5.14 in 2011 to 5.63% in 2022, compared to the projected increase from 5.17 to 6.07.

Table 4.4: *Projected number of acceptors for spacing methods: Jharkhand and India change the method mix*

STATE/YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
JHARKHAND	0.55	0.57	0.62	0.67	0.73	0.8	0.87	0.93	1	1.07	1.15	1.23
INDIA	31.04	32.52	33.12	33.74	34.34	34.89	35.42	35.97	36.49	36.98	37.44	37.92

Table 4.5: *Projected number of acceptors for spacing methods: Jharkhand and India continue as today*

STATE/YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
JHARKHAND	0.55	0.57	0.59	0.62	0.66	0.69	0.73	0.76	0.8	0.83	0.87	0.91
INDIA	31.04	32.08	33.0	33.9	34.96	35.91	36.85	37.84	38.82	39.79	40.75	41.7

Table 4.6: *Projected number of acceptors for limiting methods: Jharkhand and India change the method mix*

STATE/YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
JHARKHAND	0.13	0.12	0.15	0.16	0.16	0.18	0.16	0.16	0.16	0.17	0.16	0.16
INDIA	5.17	5.05	5.3	5.34	5.37	5.39	5.66	5.7	5.75	5.81	5.88	6.07

Table 4.7: *Projected number of acceptors for limiting methods: Jharkhand and India continue as today*

STATE/YEAR	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
JHARKHAND	0.13	0.14	0.17	0.19	0.2	0.2	0.2	0.2	0.21	0.21	0.22	0.23
INDIA	5.14	4.85	5.07	5.1	5.12	5.12	5.36	5.38	5.41	5.46	5.5	5.63

The comparison between the actual and projected numbers highlights the need for more effective interventions and strategies to address the unmet needs in family planning in both Jharkhand and India. Public-Private Partnerships (PPPs) can play a vital role in bridging this gap by expanding the reach of family planning services, improving the quality of care, promoting awareness about contraceptive options, leveraging the expertise and resources of private partners, and fostering innovation in service delivery (NIHWF, Jharkhand 2023).

By actively promoting and implementing PPPs in family planning, Jharkhand and India can work towards accelerating the growth rate in the acceptance of spacing and limiting methods. This, in turn, will help bridge the gap between the actual and projected numbers and contribute to improving maternal and child health outcomes, empowering women, and promoting sustainable development in both the state and the country.

Despite Jharkhand's commendable efforts in allocating resources to healthcare, the state still faces challenges in providing accessible, affordable, and quality healthcare to its population, a problem shared by many other states in India. This is where the adoption of Public-Private Partnerships (PPPs) in the healthcare sector can play a pivotal role in bridging the gap between the state's efforts and the actual health outcomes.

PPPs in healthcare offer a collaborative approach that leverages the expertise, resources, and efficiency of the private sector to complement the government's initiatives. By partnering with private entities, the government can expand the reach of healthcare services, particularly in rural and remote areas, and enhance the quality of care provided. Moreover, PPPs can help alleviate the financial burden on the state government by sharing the costs of healthcare infrastructure development and maintenance, allowing the government to allocate its resources more effectively and focus on other critical aspects of healthcare, such as public health initiatives and capacity building.

The consistent trend of higher health expenditure in Jharkhand compared to the national average underscores the state government's recognition of the importance of investing in healthcare. However, to translate this investment into better health outcomes, adopting PPPs can be a strategic move. By harnessing the strengths of both the public and private sectors, Jharkhand can work towards building a more resilient, efficient, and equitable healthcare system that caters to the needs of its population. The adoption of PPPs in healthcare can be a catalyst for positive change, helping Jharkhand address its healthcare challenges and improve the overall well-being of its citizens.

4.3 Mapping Quality Differentials between Public and Private Healthcare Facilities in Jharkhand

The reliability and validity of the survey instruments are as follows:

Patients' Data

	Cronbach's α	McDonald's ω
scale	0.919	0.933

The Cronbach's alpha (0.819) and McDonald's omega (0.863) values for the scale used to measure patients' data indicate good internal consistency and reliability. These high values suggest that the items within the scale are closely related and measure the same underlying construct, making the scale reliable for assessing the intended concept.

Staff Data

	Cronbach's α	McDonald's ω
scale	0.933	0.948

The Cronbach's alpha (0.933) and McDonald's omega (0.948) values indicate excellent internal consistency and reliability of the scale, suggesting that the items measure the same underlying construct consistently.

4.3.1 Private Hospitals

A total of 28 private hospitals were randomly selected from the Ranchi district of Jharkhand, India, for a study on the implementation and impact of the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY) scheme. The hospitals were chosen from both subdivisions of the district, namely Ranchi subdivision and Bundu subdivision, ensuring a representative sample. These private hospitals are empanelled under the AB PM-JAY scheme, which means they have been approved by the State Health Authority to provide medical treatment to eligible beneficiaries using their PM-JAY e-cards. The selection of hospitals from both subdivisions allows for a comprehensive analysis of the scheme's effectiveness in the Ranchi district.

Patient Response Summary

A survey assessing patient experiences and perceptions of healthcare quality using a 5-point scale revealed generally positive responses, with patients reporting easy access to medical specialists, thorough examinations, well-explained tests, and competent doctors. However, concerns emerged regarding patients' difficulty discussing concerns, hurried treatment by doctors, questionable diagnosis accuracy, and affordability of care. While registration processes and facility navigation were convenient, long wait times and limited office hours were problematic. Patients reported mixed experiences with staff communication and feedback

collection. Notably, many patients felt inadequately informed about medication side effects and purposes, highlighting a need for improved patient education. These findings offer valuable insights for enhancing healthcare quality and addressing service delivery gaps.

***Table 4.8**: Patients' Response (Private Hospital)*

Statements	**Mean**	**SD**
I have easy access to the medical specialists I need.	3.39	1.35
When I go for medical care, they are careful to check everything when treating and examining me.	3.86	1.07
Those who provide my medical care sometimes hurry too much when they treat me.	2.78	1.13
Doctors are good about explaining the reason for medical tests.	3.92	0.87
I'm informed well for prescription of given tablets.	4.14	0.85
I find difficult to talk about things that concern me.	3.44	1.12
I feel that I'm treated as person rather than a disease.	4.32	0.64
I have to pay for more of my medical care than I can afford.	3.65	1.09
My doctors are very competent and well-trained.	4.09	0.54
Some of the doctors I have seen lack experience with my medical problems.	3.28	1.09
The medical staff that treats me knows about the latest medical developments.	3.94	0.57
Sometimes doctors make me wonder if their diagnosis is correct.	3.08	1.18
Doctors never expose me to unnecessary risk.	3.98	0.70
Nursing staff gave sufficient explanation on symptoms and treatment plans that were easy to comprehend.	3.91	0.90
Nursing staff explain things in an understandable way regarding my query.	4.00	0.87
Physician/Nurse explained possible medication side effects.	3.09	1.39
Physician/Nurse explained what medication was for.	4.05	0.56
Regular feedback from the patient about health status is taken.	3.08	1.43
I find it easy to get an appointment for medical care right away.	3.37	1.26
Staff was prompt in receiving and returning phone calls.	2.58	1.10
The registration procedure for consultations was convenient.	3.46	1.33
I am usually kept waiting for a long time when I am at the doctor's office.	2.61	1.23
Hospital facilities were easy to locate (e.g. consultation room, diagnostic department, physical therapy room, and restroom).	3.16	1.28
The office where I get medical care should be open for more hours than it is.	2.22	1.32

Staff Response Summary

The survey assessed healthcare staff perceptions of patient safety, staffing, and hospital management using a 5-point scale. Overall, responses were positive, with staff reporting

sufficient personnel, good cooperation among units, effective error prevention systems, and a management-promoted safety climate. However, concerns were raised about working in "crisis mode" and high-pressure environments. Staff felt that management was proactive about patient safety and that mistakes were not held against them. Information exchange across units and during shift changes was not problematic, and staff actively worked to improve safety and evaluate the effectiveness of changes. These findings highlight strengths and areas for improvement in patient safety culture and hospital management practices.

***Table 4.9**: Private Hospital Staff's Response*

Statements	Mean	SD
We have enough staff to handle the workload	4.82	0.48
We use more agency/temporary staff than is best for patient care	1.42	0.56
We work in "crisis mode" trying to do too much, too quickly	2.61	0.74
There is good cooperation among hospital units that need to work together	4.90	0.32
Hospital units work well together to provide the best care for patients	4.97	0.20
Problems often occur in the exchange of information across hospital units	1.53	0.50
Important patient care information is often lost during shift changes	1.28	0.45
Shift changes are problematic for patients in this hospital	1.29	0.45
Our procedures and systems are good at preventing errors from happening	4.80	0.41
Staff feel like their mistakes are held against them	1.32	0.49
Hospital management provides a work climate that promotes patient safety	4.89	0.33
Hospital management seems interested in-patient safety only after an adverse event happens	1.37	0.67
Patient safety is never sacrificed to get more work done	4.63	0.60
We are actively doing things to improve patient safety	4.89	0.33
After we make changes to improve patient safety, we evaluate their effectiveness	4.90	0.32

4.3.2 Public Hospitals

Patient Response Summary

A survey assessing patient experiences and perceptions of healthcare quality revealed generally positive responses, with patients reporting access to medical specialists, careful examinations, and well-explained tests. However, concerns emerged regarding patients' difficulty discussing concerns, hurried treatment by doctors, questionable diagnosis accuracy, and affordability of care. While registration processes were convenient, long wait times and limited office hours were problematic. Patients reported mixed experiences with staff communication and feedback collection, and many felt inadequately informed about medication side effects and purposes. These findings highlight strengths and areas for improvement in healthcare quality and service delivery, particularly in patient education and communication.

***Table 4.10**: Patients' Response (Public Hospital)*

Statements	Mean	SD
I have easy access to the medical specialists I need.	2.93	1.25
When I go for medical care, they are careful to check everything when treating and examining me.	3.94	1.01
Those who provide my medical care sometimes hurry too much when they treat me.	2.54	1.17
Doctors are good about explaining the reason for medical tests.	3.81	0.87
I'm informed well for prescription of given tablets.	4.00	0.86
I find difficult to talk about things that concern me.	3.54	1.14
I feel that I'm treated as person rather than a disease.	4.11	0.61
I have to pay for more of my medical care than I can afford.	3.70	1.09
My doctors are very competent and well-trained.	4.01	0.35
Some of the doctors I have seen lack experience with my medical problems.	3.30	1.01
The medical staff that treats me knows about the latest medical developments.	3.85	0.59
Sometimes doctors make me wonder if their diagnosis is correct.	3.39	1.15
Doctors never expose me to unnecessary risk.	3.80	0.83
Nursing staff gave sufficient explanation on symptoms and treatment plans that were easy to comprehend.	3.83	0.82
Nursing staff explain things in an understandable way regarding my query.	4.03	0.84
Physician/Nurse explained possible medication side effects.	2.78	1.36
Physician/Nurse explained what medication was for	4.05	0.78
Regular feedback from the patient about health status is taken.	2.65	1.24
I find it easy to get an appointment for medical care right away.	2.98	1.21
Staff was prompt in receiving and returning phone calls.	2.25	1.03
The registration procedure for consultations was convenient.	3.09	1.27
I am usually kept waiting for a long time when I am at the doctor's office.	2.60	1.26
Hospital facilities were easy to locate (e.g. consultation room, diagnostic department, physical therapy room, and restroom).	2.83	1.27
The office where I get medical care should be open for more hours than it is.	2.04	1.38

Staff Response Summary

Using a 5-point rating system, the study evaluated how healthcare workers felt about hospital administration, staffing, and patient safety. Responses were mixed overall, containing both areas for development and some favorable elements. Employees said that there was enough staff to manage the demand and that hospital units worked well together. Additionally, they believed that the hospital administration fostered a work environment that supported patient safety and that their protocols and systems successfully averted errors. Concerns were expressed, meanwhile, over the use of temporary workers, operating in "crisis mode," and the management's lack of interest in patient safety until after unfavourable incidents. Employees believed that errors were occasionally used against them, and information sharing across units

and during shift changes was challenging. Notwithstanding these problems, employees made a concerted effort to increase safety and assessed how well the modifications were working. These findings highlight the need for targeted interventions to address identified challenges and further enhance patient safety culture.

***Table 4.11**: Public Hospital Staff's Response*

Statements	Mean	SD
We have enough staff to handle the workload	4.48	0.61
We use more agency/temporary staff than is best for patient care	1.85	0.84
We work in "crisis mode" trying to do too much, too quickly	2.68	0.90
There is good cooperation among hospital units that need to work together	4.47	0.63
Hospital units work well together to provide the best care for patients	4.60	0.82
Problems often occur in the exchange of information across hospital units	1.75	0.78
Important patient care information is often lost during shift changes	1.57	0.54
Shift changes are problematic for patients in this hospital	1.53	0.54
Our procedures and systems are good at preventing errors from happening	4.35	0.81
Staff feel like their mistakes are held against them	1.94	0.88
Hospital management provides a work climate that promotes patient safety	4.44	0.79
Hospital management seems interested in-patient safety only after an adverse event happens	1.78	0.90
Patient safety is never sacrificed to get more work done	4.43	0.61
We are actively doing things to improve patient safety	4.55	0.61
After we make changes to improve patient safety, we evaluate their effectiveness	4.56	0.62

4.4 Results of Quantitative Analyses

Analysis is performed using the Perceived Quality Score calculated from the patient and staff surveys. Principal Component Analysis is used to calculate the weights for the same.

4.4.1 Principal Component Analysis

Patients' Data

The Table-4.12 presents the results of a PCA conducted on 24 survey items related to patient experiences with healthcare. The analysis aimed to identify underlying factors or components that explain the correlations among the items. Three principal components were extracted using varimax rotation.

The component loadings, representing the correlations between survey items and the extracted components, provide insights into the key dimensions of patient perceptions. Component 1 is associated with accessibility, communication, and patient-centred care, while Component 2 relates to safety. Component 3 captures both efficiency and effectiveness.

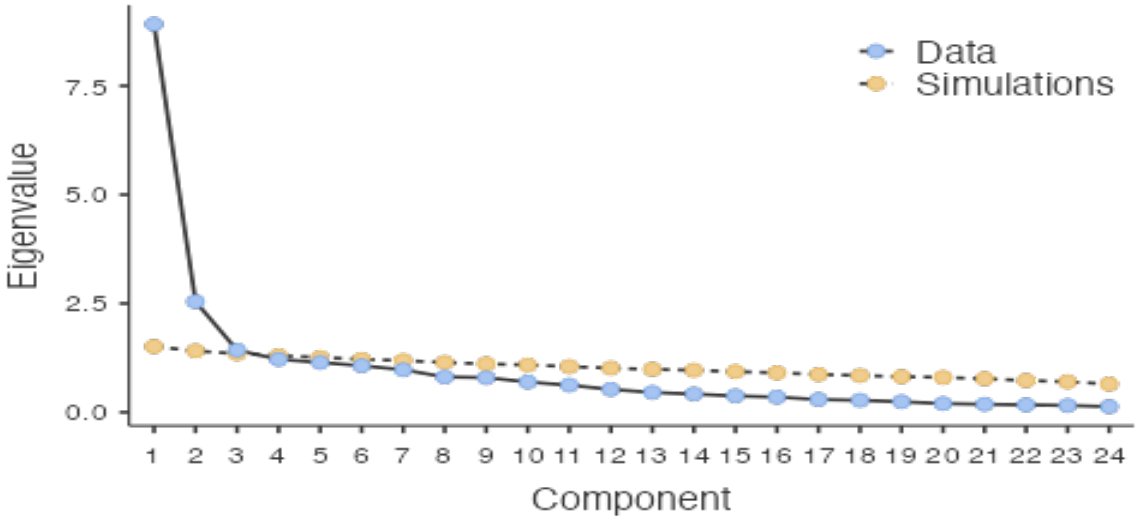
However, the uniqueness values suggest that the three-component solution. Several items have uniqueness over 0.5, indicating that more components might be needed to adequately represent the complexity of patient experiences reflected in the survey items.

In conclusion, the PCA results provide valuable insights into the multifaceted nature of patient perceptions about the quality and accessibility of their healthcare. However, the analysis also highlights the need for further exploration to fully understand the underlying factors influencing these experiences.

***Table 4.12**: Component Loadings of Patients' Data*

Indicators	Component			Uniqueness
	1	2	3	
Regular feedback from the patient about health status is taken.	0.819			0.241
Staff was prompt in receiving and returning phone calls.	0.790			0.252
I have easy access to the medical specialists I need.	0.789			0.308
Physician/Nurse explained possible medication side effects.	0.776	0.340		0.271
The registration procedure for consultations was convenient.	0.735			0.396
I feel that I'm treated as person rather than a disease.	0.679			0.441
Hospital facilities were easy to locate (e.g. consultation room, diagnostic department, physical therapy room, and restroom).	0.678	0.437		0.347
I find it easy to get an appointment for medical care right away.	0.673			0.439
I'm informed well for prescription of given tablets.	0.665		0.427	0.373
Doctors are good about explaining the reason for medical tests.	0.654			0.550
When I go for medical care, they are careful to check everything when treating and examining me.	0.631			0.570
Nursing staff explain things in an understandable way regarding my query.	0.588		0.349	0.524
Nursing staff gave sufficient explanation on symptoms and treatment plans that were easy to comprehend.	0.575			0.590
Doctors never expose me to unnecessary risk.	0.445			0.799
Those who provide my medical care sometimes hurry too much when they treat me.	0.408			0.783
My doctors are very competent and well-trained.	0.303			0.833
Some of the doctors I have seen lack experience with my medical problems.		-.832		0.284
Sometimes doctors make me wonder if their diagnosis is correct.		-.751		0.414
The office where I get medical care should be open for more hours than it is.	0.493	0.727		0.180
I find difficult to talk about things that concern me.		-.679	0.315	0.375
I have to pay for more of my medical care than I can afford.	-.453	-.604		0.420
I am usually kept waiting for a long time when I am at the doctor's office.			-.654	0.554
The medical staff that treats me knows about the latest medical developments.			0.613	0.609
Physician/Nurse explained what medication was for.		-.352	0.552	0.557

Scree Plot



The Scree plot helps in determining the "elbow point" or the point where the eigenvalues start to level off. Based on the Scree plot interpretation, it appears that retaining three components would be appropriate for this analysis. These components likely represent the most important dimensions underlying the patient experience survey items.

Staff Data

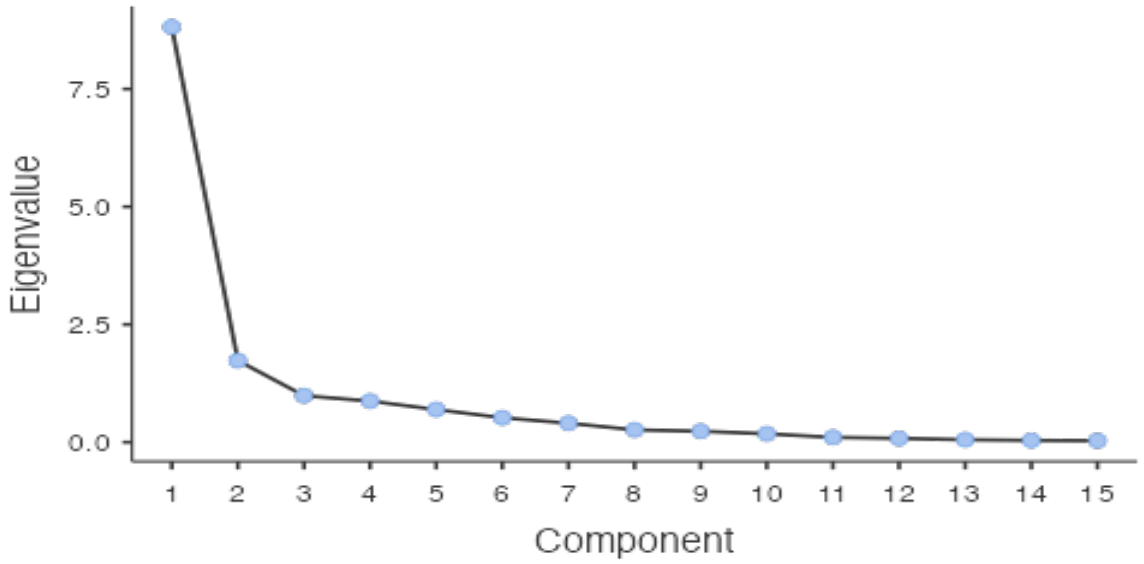
The principal component analysis (PCA) of 15 survey items related to patient safety culture in a hospital identified three key components: 1) teamwork, communication, and management support for safety (item loadings: 0.842-0.887); 2) problems with staffing, information exchange, and punitive responses to errors (item loadings: 0.652-0.873); and 3) a distinct dimension of workplace stress and overload, captured by one "crisis mode" item (loading: 0.992). The 3 components explain a substantial portion of data variance (uniqueness < 0.5 for most items). These findings highlight important factors that could impact patient safety outcomes and warrant further investigation, particularly the unique "crisis mode" dimension.

***Table 4.13**: Component Loadings of Staff's Data*

Indicators	**Component**			**Uniqueness**
	1	**2**	**3**	
We have enough staff to handle the workload	0.524	0.593		0.36962
We use more agency/temporary staff than is best for patient care		0.689		0.44411
We work in "crisis mode" trying to do too much, too quickly			0.992	0.00648
There is good cooperation among hospital units that need to work together	0.877			0.13381
Hospital units work well together to provide the best care for patients	0.868			0.19762

Problems often occur in the exchange of information across hospital units	0.509	0.663		0.30088
Important patient care information is often lost during shift changes		0.873		0.18127
Shift changes are problematic for patients in this hospital		0.836		0.23197
Our procedures and systems are good at preventing errors from happening	0.868	0.380		0.09909
Staff feel like their mistakes are held against them	0.530	0.652		0.29408
Hospital management provides a work climate that promotes patient safety	0.887			0.15547
Hospital management seems interested in-patient safety only after an adverse event happens		0.717		0.39500
Patient safety is never sacrificed to get more work done		0.861		0.23189
We are actively doing things to improve patient safety	0.842			0.21304
After we make changes to improve patient safety, we evaluate their effectiveness	0.776	0.428		0.21042

Scree Plot



Based on the Scree plot interpretation, it appears that retaining three components would be appropriate for this analysis. These components likely represent the most important dimensions underlying the patient experience survey items.

4.4.2 Perceived Quality Score- Patients

The perceived quality score (PQS) is the weighted average response of patients, weights being the square of the factor loadings extracted using principal component analysis of the patient survey data. These quality scores are also used to categorize the service of the healthcare facilities as 'good' or 'bad'. Scores equal to and above the 75th percentile of the standardized perceived quality scores are classified as 'good', those below it as 'bad'. We conduct the Z-test of Proportions to find out whether proportionately more private healthcare facilities are

perceived as good compared to the public ones. A χ^1 test is also performed to check for the association between the ownership of the facility and its perception of being good or bad.

4.4.3 Multiple Linear Regression

R, the multiple correlation coefficient, measures the strength of the linear relationship between the dependent variable and the independent variables.

Model Fit Measures	
R	R^2
0.917	0.8405

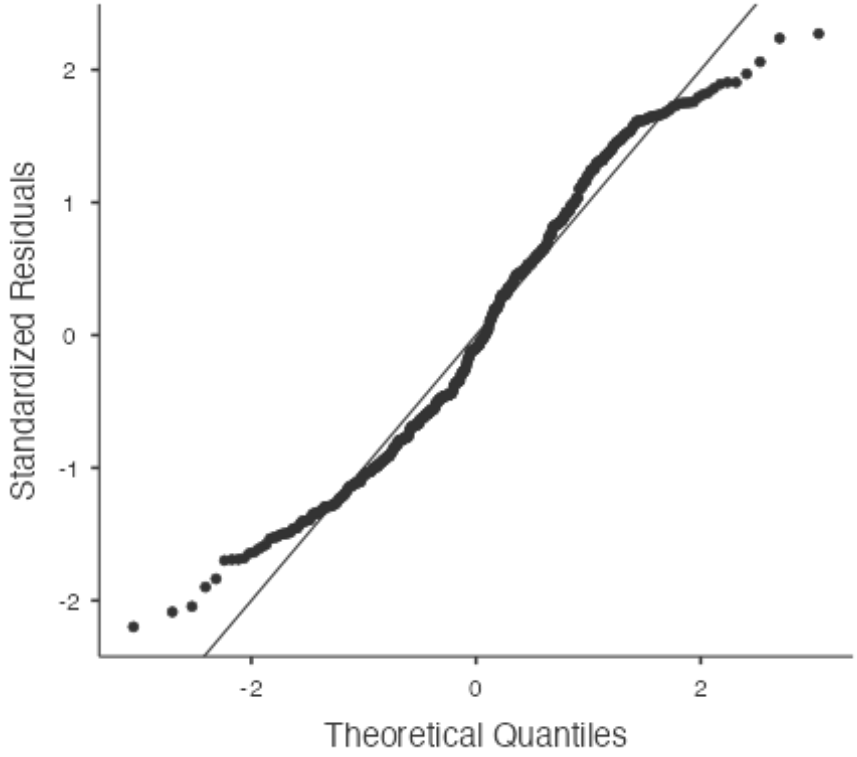
In this case, R = 0.917, indicating a relatively strong positive linear relationship. R^2, the coefficient of determination, represents the proportion of variance in the dependent variable that can be explained by the independent variables. Here, R^2 = 0.8405, meaning that only 84.05% of the variance in the dependent variable can be accounted for by the independent variables included in the model.

Normality Test (Shapiro-Wilk)	
Statistic	**p**
0.972	< .001

A statistical test for determining whether a sample of data is regularly distributed is the Shapiro-Wilk test. The p-value in this instance is less than 0.001, and the test statistic is 0.972. We reject the null hypothesis and come to the conclusion that there is substantial evidence that the data is not normally distributed because the p-value is below the often used significance level of 0.05.

If the data is normally distributed, a p-value of less than 0.001 means that there is a less than 0.1% chance of seeing a test statistic as extreme as 0.972. This offers strong evidence that the premise of normalcy is incorrect. Before using parametric tests that presuppose normality, it could be essential to modify the data or employ non-parametric statistical techniques when the data deviates sufficiently from a normal distribution.

(a) Q-Q Plot



(b) Residuals Plots

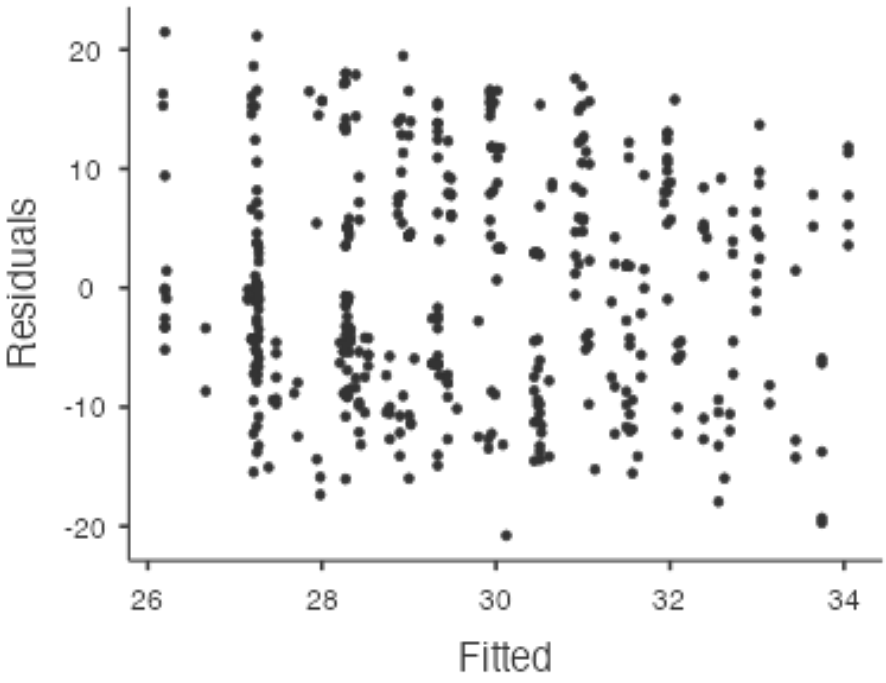


***Figure 4.6**: (a) Q-Q plot, and (b) Residual plot*

4.4.4 Z–Test of Proportions

The study tests for the following hypothesis:

H_1: The quality of healthcare facilities/services provided by private entities is better than those provided by the public entities/healthcare system/network. To test this, the study uses the multiple regression model:

$$y_{ij} = \alpha_0 + \beta h_{ij} + \boldsymbol{X'}_i \boldsymbol{\gamma}_0 + \boldsymbol{H'}_j \boldsymbol{\delta} + \varepsilon_{ij}$$

***Table 4.14**: Result of Multiple Linear Regression Model Tested*

			95% Confidence Interval			
Predictor	**Estimate**	**SE**	**Lower**	**Upper**	**t**	***p***
Intercept	30.389	1.607	27.22918	33.548	18.905	< .001
Private	1.173	1.141	-1.06957	3.416	1.028	0.304
% of Private Hospitals Nearby	-1.396	1.967	-5.26195	2.469	-0.710	0.478
Total Nearby Hospitals	0.317	0.159	0.00423	0.630	1.992	0.047
Male	-1.018	0.913	-2.81393	0.777	-1.115	0.266
Age Group: 40–60	-1.058	0.667	-2.36881	0.253	-1.586	0.113
Age Group: 60–80	-1.066	0.637	-2.40880	0.257	-1.601	0.115

Table presented above, the results of the OLS estimation of the parameters of the model presented in Equation: perceived quality score regressed on being treated at a private healthcare facility, conditional on patient and hospital characteristics.

The coefficient of the dummy variable 'private' bears the expected sign and indicates that the perceived quality score is 17.3% higher for private hospitals compared to the public ones, but it is statistically insignificant. Thus, the study cannot for sure say that private hospitals are perceived to offer better healthcare services than the public ones. Additionally, the quality score seems to be negatively affected by the private-public mix of hospitals in the neighbourhood, being a male patient, and belonging to older age groups—although these effects are statistically insignificant. The only statistically significant effect is that of total number of hospitals in the 5-kilometre radius catchment area. This small yet positive effect on quality ratings may be the result of higher competition among the hospitals. ***Hence the null hypothesis is accepted.***

Additionally, using the same empirical model, the study checks the quality of healthcare facilities provided private entities for two specific departments, General Physician and ENT, is better than those provided by the public entities/healthcare system/network.

***Table 4.15**: Result of Empirical Model Tested for General Medicine and ENT*

Practice: General Medicine							
	Intercept	**Private**	**% of Private Hospitals Nearby**	**Total Nearby Hospitals**	**Male**	**40–60**	**60-80**
OLS estimate	–0.23	–0.27	–0.01	0.22	0.01	0.06	0.33
p–value	0.45	0.00	0.69	0.71	0.00	0.30	0.76
Practice: ENT							
OLS estimate	0.01	0.436	0.09	0.02	0.01	0.05	0.09
p–value	0.02	0.023	0.84	0.34	0.20	0.37	0.50

From the first analysis it is found that $OLS \quad estimate\ \beta$ value is -0.27 and has a significant p-value of 0.00 at 0.05 significance level, which suggests that public hospitals are better than private hospitals for General Physician/General Medicine.

Also, from the second analysis it is found that $OLS \quad estimate\ \beta$ value is 0.436 and has a significant p-value of 0.023 at 0.05 significance level, which suggests that private hospitals are better than public hospitals for ENT.

H_2: The proportion of patients who rank the quality of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital.

The Z test of proportions to check whether the proportion of patients in private hospitals who rank the quality of care as good is higher than the proportion of patients in public hospitals who rank the quality of care as good used standardized perceived quality scores equal to or above the 75th percentile to classify a score as 'good'. Results show that patients in public hospitals are more likely rate the services as bad compared to the patients in private hospitals.

***Table 4.16**: Z Test of Proportions for H_2*

		Quality of Service		
Type of hospital		**Bad**	**Good**	**Total**
Private	Observed	173	70	243
	% within row	71.2 %	28.8 %	100.0 %
Public	Observed	157	37	194
	% within row	80.9 %	19.1 %	100.0 %

Total Observed	330	107	437
% within row	75.5 %	24.5 %	100.0 %
χ^2 Tests	**Value**		***p***
z test difference in 2 proportions	-2.35		0.019
N	437		

Conversely, proportionately more patients in private hospitals rate the services as good compared to the ones in public hospitals; the difference in proportions is statistically significant. Hence, ***we reject the null hypothesis***.

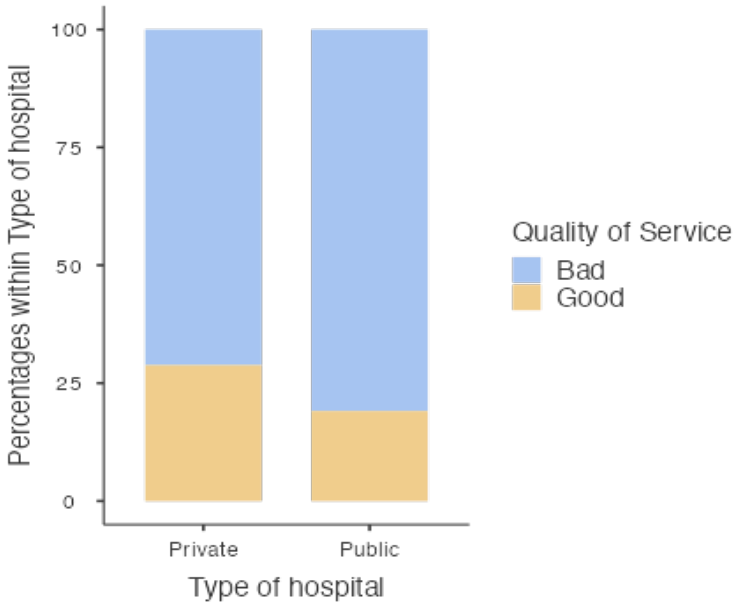


Figure 4.7*: The proportion of patients' ranking the quality of care*

H_{2A}: Safety aspect of Quality differential- Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals.

The Z test of proportions to check whether the proportion of patients in private hospitals who rank the safety aspect of quality of care as good is higher than the proportion of patients in public hospitals who rank the safety aspect of quality of care as good used standardized perceived quality scores equal to or above the 75th percentile to classify a score as 'good'. Results show that patients in public hospitals are more likely rate the safety as bad compared to the patients in private hospitals.

***Table 4.17**: Z Test of Proportions for H_{2A}*

		Safety Quality			
Hospital Type		**Good**		**Poor**	**Total**
Public (PH)	Observed	44		150	194
	% within row	22.7 %		77.3 %	100.0 %
Private (PR)	Observed	68		175	243
	% within row	28.0 %		72.0 %	100.0 %
Total	Observed	112		325	437
	% within row	25.6 %		74.4 %	100.0 %
χ^2 Tests			**Value**		***p***
z test difference in 2 proportions			-1.26		0.207
N			437		

Conversely, proportionately more patients in private hospitals rate the safety as good compared to the ones in public hospitals; but the difference in proportions is statistically insignificant. Hence, ***we accept the null hypothesis***.

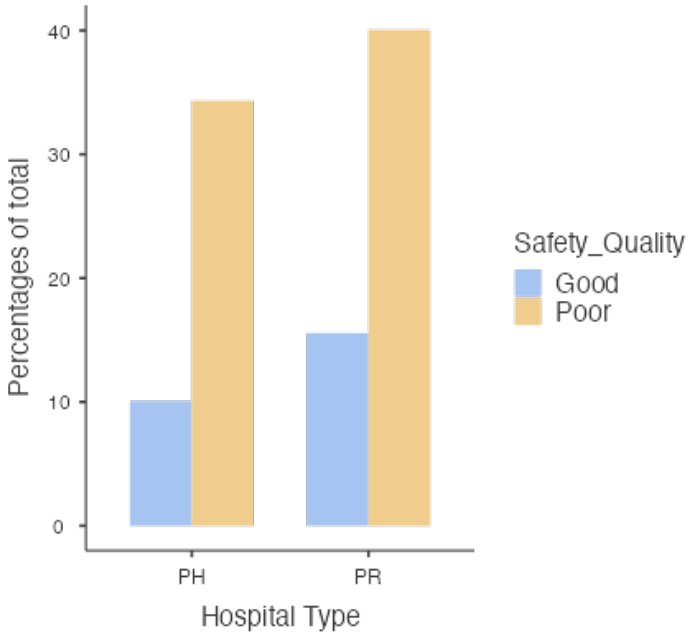


***Figure 4.8**: Safety aspect of Quality differential*

H_{2B}: Patient Centredness aspect of Quality differential- Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals than in public hospitals.

The Z test of proportions to check whether the proportion of patients in private hospitals who rank the Patient Centredness aspect of quality of care as good is higher than the proportion of

patients in public hospitals who rank the Patient Centredness aspect of quality of care as good used standardized perceived quality scores equal to or above the 75th percentile to classify a score as 'good'. Results show that patients in public hospitals are more likely rate the Patient Centredness as bad compared to the patients in private hospitals.

***Table 4.18**: Z Test of Proportions for H_{2B}*

			Patient Centeredness Quality		
Hospital Type			**Good**	**Poor**	**Total**
Public (PH)	Observed		39	155	194
	% within row		20.1 %	79.9 %	100.0 %
Private (PR)	Observed		85	158	243
	% within row		35.0 %	65.0 %	100.0 %
Total	Observed		124	313	437
	% within row		28.4 %	71.6 %	100.0 %
				Value	***p***
z test difference in 2 proportions				-3.43	< .001
N				437	

Conversely, proportionately more patients in private hospitals rate the services as good compared to the ones in public hospitals; the difference in proportions is statistically significant. Hence, ***we reject the null hypothesis***.

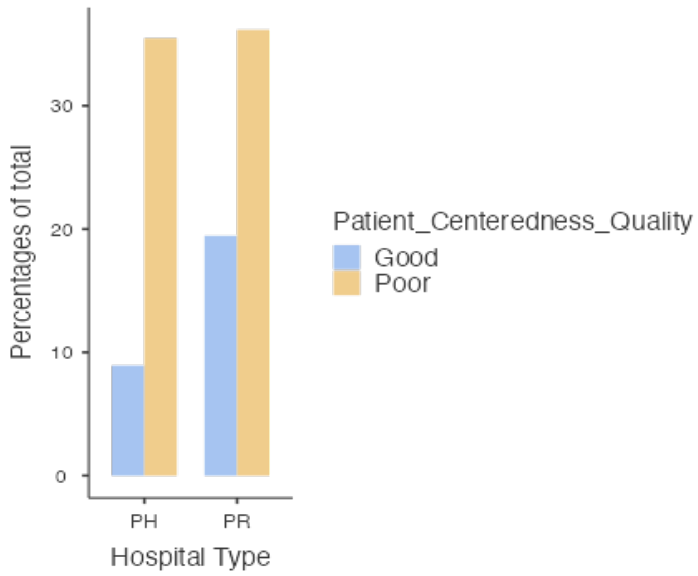


***Figure 4.9**: Patient Centredness aspect of Quality differential*

H_{2C}: Effectiveness aspect of Quality differential- Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals.

The Z test of proportions to check whether the proportion of patients in private hospitals who rank the Patient Centredness aspect of quality of care as good is higher than the proportion of patients in public hospitals who rank the Patient Centredness aspect of quality of care as good used standardized perceived quality scores equal to or above the 75th percentile to classify a score as 'good'. Results show that patients in public hospitals are more likely rate the Patient Centredness as bad compared to the patients in private hospitals.

***Table 4.19**: Z Test of Proportions for H_{2C}*

		Effectiveness Quality		
Hospital Type		**Good**	**Poor**	**Total**
Public (PH)	Observed	36	158	194
	% within row	18.6 %	81.4 %	100.0 %
Private (PR)	Observed	77	166	243
	% within row	31.7 %	68.3 %	100.0 %
Total	Observed	113	324	437
	% within row	25.9 %	74.1 %	100.0 %

	Value	***p***
z test difference in 2 proportions	-3.11	0.002
N	437	

Conversely, proportionately more patients in private hospitals rate the services as good compared to the ones in public hospitals; the difference in proportions is statistically significant. Hence, ***we reject the null hypothesis***.

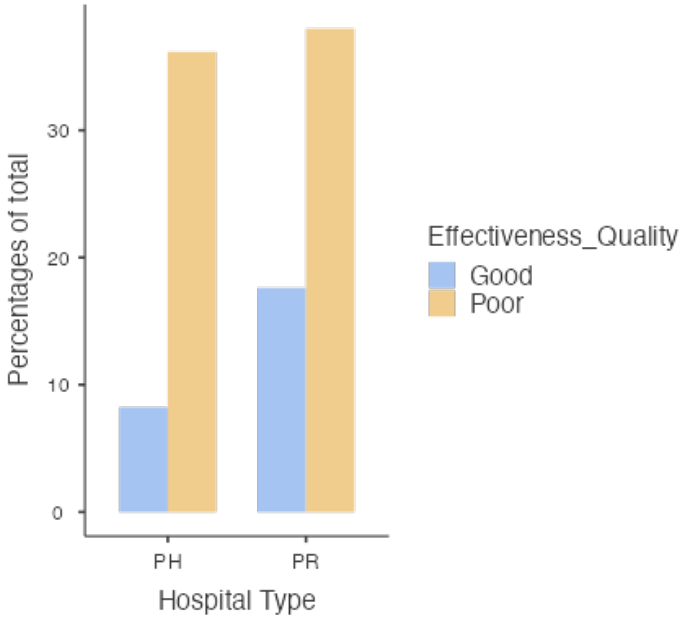


Figure 4.10: *Effectiveness aspect of Quality differential*

H_3: The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital.

Similar results were obtained for the Z test of proportions conducted to check whether the proportion of nursing staff in private hospitals who rank the quality of care as good is higher than the proportion of nursing staff in public hospitals who rank the quality of care as good. Using the 75th percentile as the cut-off point, the study finds that while majority of the nurses surveyed rate the quality of service rendered by their hospitals as bad, this proportion is higher in public hospitals (close to 70%) than in the private hospitals where the opinion is divided almost equally (51 vs. 49 percent).

Table 4.20: *Z Test of Proportions for H_3*

			Quality of Service			
Type of hospital			**Bad**		**Good**	**Total**
Public (PH)	Observed		92		45	137
	% within row		67.2 %		32.8 %	100.0 %
Private (PR)	Observed		102		98	200
	% within row		51.0 %		49.0 %	100.0 %
Total	Observed		194		143	337
	% within row		57.6 %		42.4 %	100.0 %
				Value		***p***

z test difference in 2 proportions		2.95		0.003
N		337		

Proportionately larger number of nurses in private hospitals rank their operations as good compared to the nurses in public hospitals; this difference is statistically significant. ***Hence, we reject the null hypothesis.***

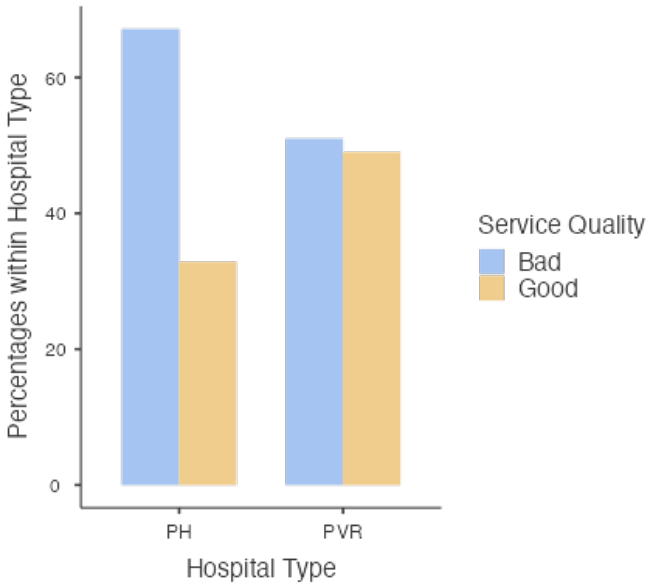


Figure 4.11*: The proportion of medical staffs' ranking the quality of care*

4.5 Results of Qualitative Findings

Frequency of most used terms was calculated by text mining the patient reviews aggregated from Google Reviews. Most frequent terms are presented as word clouds. Sentiment Analysis was used to extract a range of emotions as well as overall positive and negative sentiment scores.

4.5.1 Private Hospitals

The word cloud of private hospitals is given in figure- 4.12

Figure 4.12: *Word Cloud of Private Hospital*

The most frequently used expression is “good” showing overall satisfaction with “doctor”, “service” and “staff”. The sentiment plot is presented in Figure-4.13

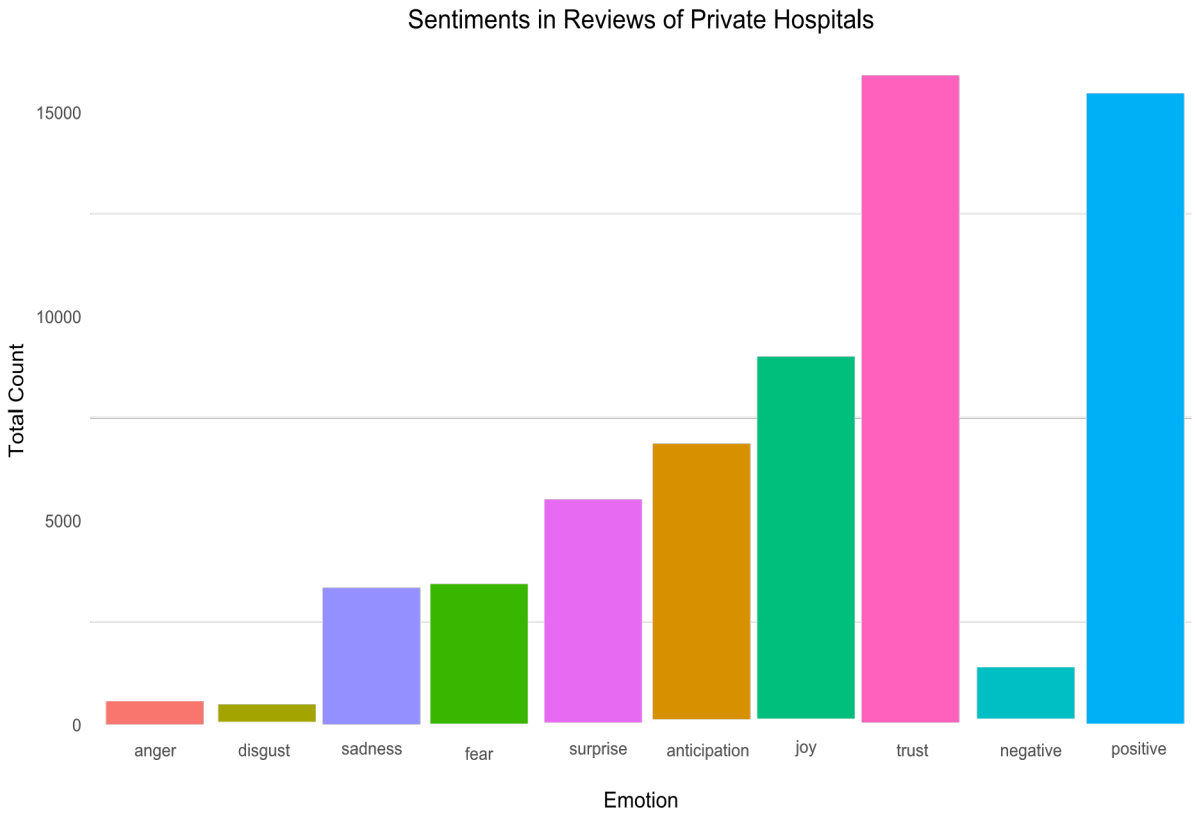


Figure 4.13: *Sentiment Reviews of Private Hospitals*

The sentiment plot represents a much higher positive emotion in comparison to negative emotion. “Trust” is the highest positive emotion followed by “joy”. “Fear” and “sadness” is the highest negative emotion but they are much lower than positive emotions.

The mean sentiment score for private hospitals is 0.3681 indicating the overall positive sentiments towards them. The minimum and maximum sentiment scores of -1 and +1 indicate that no extreme emotions were expressed by the reviewers. The summary of the sentiment scores is presented in Table-4.21

Table 4.21: *Sentiment Scores of Private Hospitals*

Minimum	-1.0000
1st Quartile	0.1667
Median	0.3333
Mean	0.3681
3rd Quartile	0.5000
Maximum	1.0000
NA’s	13.0000

4.5.2 Public Hospitals

The word cloud of public hospitals is given in Figure- 4.14

Figure 4.14: *Word Cloud of Public Hospitals*

The most frequently used expression is “good” showing overall satisfaction with “doctor”, “treatment”, “available facility”, “service” and “staff”.

The sentiment plot is presented in Figure- 4.15

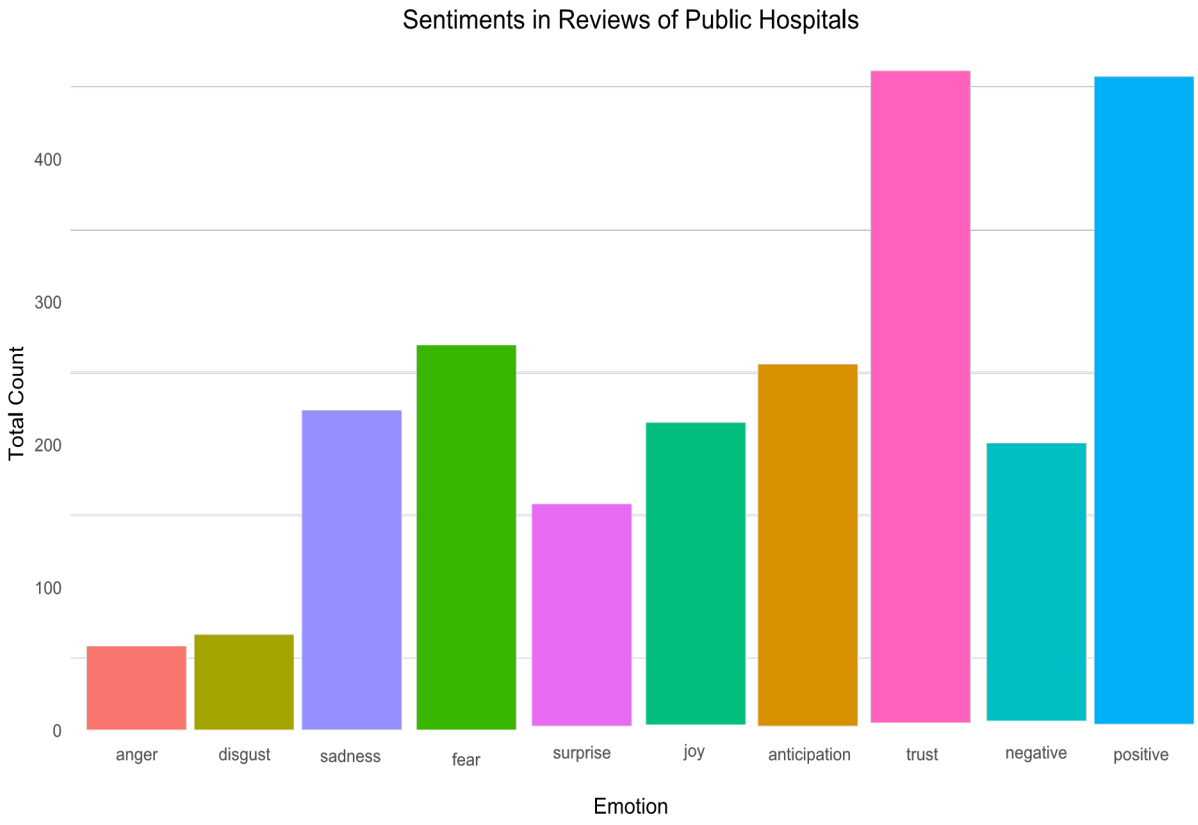


Figure 4.15: *Sentiment Reviews of Public Hospitals*

The sentiment plot represents a higher positive emotion in comparison to negative emotion. “Trust” followed by “anticipation” is the highest positive emotion. “Fear” followed by “sadness” is the highest negative emotion. However, “fear” is lower than “trust”.

The mean sentiment score for public hospitals is 0.31152 indicating the overall positive sentiments towards them. The minimum and maximum sentiment scores of -1 and +1 indicate that no extreme emotions were expressed by the reviewers. The summary of the sentiment scores is presented in Table- 4.22.

Table 4.22: *Sentiment Scores of Public Hospital*

Minimum	-1.00000
1st Quartile	0.04124
Median	0.26491
Mean	0.31152
3rd Quartile	0.50000
Maximum	1.00000
NA's	1.00000

4.5.3 Test of Difference between Mean Sentiment Scores

As corollary to hypothesis H_2, we hypothesise that the mean sentiment score of private hospitals will be greater than of the public hospital, i.e.,

H_{2D} : The mean sentiment score of private hospitals is greater than that of public hospitals.

We test this hypothesis by calculating the independent samples t-Test statistic for difference in means for unequal sample sizes and variances.

$$t = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$= \frac{0.3681 - 0.31152}{\sqrt{\frac{0.006533}{8408} + \frac{0.005138}{335}}}$$

$$= 14.09474$$

The degrees of freedom is calculated by Welsch's formula:

$$df = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_2}\right)^2}{n_2 - 1}}$$

$$= \frac{\left(\frac{0.006533}{8408} + \frac{0.005138}{335}\right)^2}{\frac{\left(\frac{0.006533}{8408}\right)^2}{8408-1} + \frac{\left(\frac{0.005138}{335}\right)^2}{335-1}}$$

$$= 369$$

The critical value of the t-statistic with 369 degrees of freedom and 5% level of significance is 1.960 which is smaller than the calculated t-statistic, therefore the null hypothesis is rejected. This implies that the mean sentiment score of the private hospitals is greater than the mean sentiment score of the public hospitals. Since the difference is in the mean sentiment scores is positive, we can say that private hospitals in general have higher positive reviews than the public hospitals.

4.6 Major Findings

The regression analysis shows that the ownership status of the hospital (public or private) does not significantly affect patients' perceived quality scores, after controlling for patient characteristics and the competitive landscape. This suggests that under the AB-PMJAY scheme, where financial constraints are alleviated, patients may not inherently associate hospital ownership with discernible differences in care quality. Thus, one of the key arguments for expanding the presence of private providers–better quality of healthcare service–does not find empirical support. However, the positive coefficient for the private hospital dummy aligns with some prior studies that found private facilities fared better on patient satisfaction metrics (Jensen et al., 2009; Milcent, 2005; Chard et al., 2011).

Interestingly, the study finds that higher competition, proxied by the total number of hospitals within a 5 km radius, is associated with higher perceived quality ratings by patients. This competition effect corroborates findings from other contexts where providers compete on nonprice factors like quality and amenities (Kessler & McClellan, 2000; Tay, 2003). The negative (but insignificant) coefficient on the proportion of private hospitals nearby suggests that market dynamics are more nuanced than a simplistic public-private distinction.

The Z-tests unambiguously show that a higher proportion of patients and staff perceive the quality at private facilities as 'good' compared to public ones. This divergence between the regression and Z-test results hints at potential limitations with the linear model specification and highlights the need to explore non-linear and quantile regression techniques. It also underscores the multi-dimensionality of healthcare quality perceptions.

From the staff's perspective, our findings align with studies that found for-profit providers faring better on quality metrics (Livingstone & Coffey, 2022; Scalise, 2012). Coupled with the patient Z-test result, this suggests that while cost considerations may not be driving

patient preferences under AB-PMJAY, perceived quality differentials could still impact healthcare utilization patterns. Sentiment analysis of patient reviews found more positive sentiment towards private hospitals, corroborating the survey findings.

These results underscore the complex relationship between ownership, competition, and perceived quality in healthcare. While private facilities appear to have some advantages in patient perceptions, the lack of significant differences in the regression model suggests other factors beyond ownership influence quality ratings under AB-PMJAY. The findings highlight opportunities to leverage competition and learn from private sector practices to improve quality across both public and private facilities.

4.7 Conclusion

Table 4.23: *Hypothesis- Accepted or Rejected*

	Hypothesis	**Accepted/ Rejected**
	The quality of healthcare facilities/services provided by private entities is better than those provided by the public entities/healthcare system/network.	Rejected
	The proportion of patients who rank the quality of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital.	Accepted
	Safety aspect of Quality differential- Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals.	Rejected
	Patient Centeredness aspect of Quality differential- Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals than in public hospitals.	Accepted
	Effectiveness aspect of Quality differential- Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals.	Accepted
	The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital.	Accepted
	The mean sentiment score of private hospitals is greater than that of public hospitals.	Accepted

CHAPTER V
DISCUSSION AND CONCLUSION

Chapter 5 | RESULTS, DISCUSSIONS AND CONCLUSION

5.1 Introduction

The provision of healthcare services via public-private partnerships (PPP) has garnered considerable focus in recent years as a strategy to enhance access, efficiency, and quality of treatment (Roehrich et al., 2014). Public-private partnerships (PPPs) entail cooperation between the public and private sectors to finance, develop, construct, and manage healthcare facilities and services (Torchia et al., 2015). Although public-private partnerships (PPPs) can capitalize on the advantages of both sectors, apprehensions regarding the quality of healthcare services provided through this model have been expressed (Alonso et al., 2015). A study conducted by Smith et al. (2018) sought to examine the disparity in quality of healthcare services delivered via public-private partnerships (PPPs) in contrast to conventional public sector provision. The researchers employed a mixed-methods approach, integrating quantitative analysis of patient outcomes and satisfaction surveys with qualitative interviews with healthcare providers and administrators (Smith et al., 2018). The research indicated that Public-Private Partnerships (PPPs) typically excelled in patient satisfaction and specific quality metrics, including waiting times and facility cleanliness (Smith et al., 2018). The results underscored difficulties in maintaining uniform quality across all PPP projects and emphasized the necessity for comprehensive monitoring and assessment systems (Smith et al., 2018). This study's findings enhance the current discourse regarding the role of Public-Private Partnerships (PPPs) in healthcare delivery and the determinants affecting the quality of services rendered through this model. Given the resource restrictions and rising demand within healthcare systems, it is essential for policymakers and practitioners to comprehend the possible advantages and drawbacks of public-private partnerships (PPPs) to enhance the accessibility and quality of healthcare services (Roehrich et al., 2014).

The investigation into the quality disparity in healthcare services provided via public-private partnerships (PPPs) is crucial as it fills essential knowledge voids about the efficacy of PPPs relative to conventional public sector delivery frameworks. The research offers a comparative comparison of quality indicators and patient outcomes, thereby guiding healthcare policy and practice to assist decision-makers in optimizing resource allocation and enhancing patient care. Furthermore, the study's results possess wider implications for public health, since they aid in the continuous endeavour to improve population health outcomes and investigate novel healthcare finance and delivery approaches.

This research can facilitate evidence-based decision-making and enhance the accessibility and quality of healthcare services as healthcare systems confront escalating problems.

5.2 Objective I: Healthcare Facilities and Infrastructure in Jharkhand

Jharkhand, an eastern Indian state, encounters considerable obstacles in delivering accessible and high-quality healthcare services to its populace. Access to fundamental and specialized healthcare services in Jharkhand is constrained, especially in rural and isolated regions (Raj et al., 2019). The state exhibits a reduced density of healthcare facilities and skilled healthcare personnel relative to the national average (Government of Jharkhand, 2018). The deficiency of resources results in disparities in healthcare access and outcomes, with marginalized populations frequently encountering the most significant obstacles (Singh et al., 2017). Enhancing healthcare infrastructure, training healthcare personnel, and executing focused public health initiatives are imperative to tackle these difficulties and guarantee the provision of vital healthcare services in Jharkhand (Rao et al., 2020).

In recent years, Jharkhand has advanced in enhancing the availability and accessibility of healthcare services through the expansion of healthcare infrastructure, the training and recruitment of healthcare personnel, the implementation of public health initiatives, and partnerships with non-governmental organizations. These initiatives have facilitated the establishment of new primary and community health clinics in underprivileged regions, mitigated the deficit of competent healthcare personnel, initiated programs addressing specific health concerns, and implemented innovative healthcare delivery methods.

Nonetheless, despite these advancements, Jharkhand continues to encounter substantial obstacles in providing equitable access to quality healthcare services, especially in remote and tribal regions, thereby requiring ongoing initiatives to enhance the healthcare system, tackle social determinants of health, and involve communities in health promotion.

5.2.1 Discussions

The hypotheses presented, in conjunction with the emphasis on healthcare services in Jharkhand, appear to be the most pertinent.

1. Health Production Function Model: This model correlates health outcomes with many inputs, including healthcare services, environmental variables, and individual behaviors. The accessibility of fundamental and specialized healthcare services in Jharkhand may be seen as a variable in the health production function, likely affecting the health outcomes of the population.

2. Grossman Model of Health Demand: This model conceptualizes health as a durable capital asset that generates an output of healthy time. Individuals are perceived as investing in their health through diverse inputs, including healthcare services. The accessibility of healthcare services in Jharkhand may influence individuals' capacity to invest in their health and preserve their health capital stock.

3. Principal-Agent Model: In the healthcare sector of Jharkhand, the government (principal) may engage or oversee healthcare providers (agents) to render services. The accessibility and calibre of healthcare services in Jharkhand may be affected by the incentives and oversight systems established between the government and healthcare providers.

The Pareto Optimality Principle, although not directly applicable to healthcare services, offers a framework for contemplating the effective allocation of resources. If healthcare services in Jharkhand are inadequate, it can be contended that the resource distribution within the healthcare system is not Pareto efficient, as enhancing access for certain persons may be achievable without detriment to others.

The discussion highlights the intricate interaction of factors affecting healthcare availability and accessibility in Jharkhand.

5.2.1.1. Healthcare Infrastructure

The gap between the necessary number of healthcare facilities and the existing deficit in rural and tribal regions of Jharkhand is a substantial issue. The greatest significant deficiency is evident in Community Health Centers (CHCs), with a shortage of 37.13% in rural areas and 7.21% in tribal territories. The deficiency of CHCs highlights the urgent necessity for the establishment of additional specialized healthcare facilities to adequately address the population's requirements. Furthermore, the Inpatient Department (IPD) and Outpatient Department (OPD) per 1000 people in Jharkhand are inferior to the national average, indicating that the state's healthcare system may be overwhelmed and need enhanced capacity to deliver sufficient medical services.

Jharkhand possesses seven Government Medical Colleges that are essential for the education of healthcare professionals and the provision of sophisticated medical services. Nonetheless, the existence of these universities alone may be inadequate to address the deficiencies in the state's healthcare system. Conversely, Jharkhand features a substantial network of 94 private hospitals, including those accredited under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) initiative. These healthcare institutions provide specialist treatment for a broad spectrum of medical disorders, addressing the varied demands of the people. Despite the existence of numerous private hospitals, Jharkhand presently lacks private medical colleges, potentially affecting the training and retention of healthcare workers.

5.2.1.2. Human Resources for Health

The authorized and established ratios of service delivery personnel to the population in Jharkhand are 1:1, indicating that the state has effectively ensured a sufficient number of healthcare experts are available to serve the populace. This ratio signifies that, on average, there is one service delivery staff member for each individual in the state, representing a notable accomplishment in healthcare accessibility.

Moreover, the doctor-to-nurse ratio in Jharkhand is documented at 1:1.5, indicating that for each physician, there are 1.5 nursing staff members available. This ratio underscores the significance of a balanced healthcare workforce, ensuring an adequate number of staff nurses to support physicians in providing quality healthcare services. Nonetheless, it is crucial to acknowledge that these ratios signify a statewide average and may not accurately depict the disparities in the distribution of healthcare professionals throughout various regions, especially between urban and rural locales.

5.2.1.3. Hospital Bed Availability

The graphical depiction of hospital bed availability in Jharkhand from 2003 to 2020 demonstrates a steady upward trajectory, signifying the state's dedicated initiatives to augment its healthcare infrastructure and expand patient care capacity. In 2003, Jharkhand had approximately 5,000 hospital beds available. By 2020, the bed count had escalated to nearly 17,500, indicating an increase of over three times. This significant augmentation highlights the state's commitment to enhancing its healthcare infrastructure and broadening its ability to provide quality medical services.

The increase in hospital bed availability significantly impacts the healthcare environment in Jharkhand. Healthcare facilities with an increased number of beds are more capable of accommodating patients, minimizing waiting periods, and delivering prompt medical interventions. This infrastructure development directly facilitates improved patient outcomes by enabling more rapid diagnosis, treatment, and post-operative care. The augmented availability of hospital beds reflects the state's commitment to healthcare infrastructure development, indicating a prioritization of resource allocation for the establishment of new medical facilities, the expansion of existing hospitals, and the enhancement of medical equipment and technology.

5.2.2 Results

The examination of healthcare availability and accessibility in Jharkhand indicates substantial deficiencies in healthcare services, especially in rural and tribal regions, with a marked shortage of Community Health Centers (CHCs). The state's healthcare system exhibits inferior Inpatient

Department (IPD) and Outpatient Department (OPD) capacity relative to the national average, indicating a strained system. Despite having seven Government Medical Colleges and a strong private healthcare system, the state lacks private medical colleges, potentially affecting the training and retention of healthcare professionals. Jharkhand maintains a commendable service delivery staff ratio of 1:1 and a balanced doctor-to-nurse ratio of 1:2, reflecting the state's commitment to establishing a sufficient healthcare workforce. The analysis indicates a sustained positive trend in hospital bed availability from 2003 to 2020, exhibiting a rise of almost three times, which reflects the state's investment in healthcare infrastructure enhancement. The findings underscore the necessity for ongoing initiatives to rectify deficiencies and guarantee equitable allocation of healthcare resources and personnel throughout the state.

To enhance the comprehension of healthcare availability and accessibility in Jharkhand, it is crucial to examine numerous supplementary elements that may impact the state's healthcare environment. A critical factor is the possible geographical differences within Jharkhand, as the allocation of healthcare facilities, specialists, and resources may differ markedly between urban and rural regions, as well as within various districts. This disparity may result in inequitable access to healthcare services, requiring focused actions to close the gap. Furthermore, the influence of social determinants of health, including socioeconomic position, education, nutrition, and environmental circumstances, is crucial, as these elements profoundly affect an individual's health and their capacity to obtain healthcare services. Addressing these social variables is essential for enhancing overall health outcomes in Jharkhand.

Although the study offers significant insights regarding the availability and accessibility of healthcare services, it is crucial to acknowledge that it does not directly evaluate the quality of treatment delivered in these facilities. Ensuring superior healthcare services is crucial for enhancing patient outcomes and happiness. Additionally, another research purpose examines the indicators of healthcare quality to attain a more thorough understanding of the performance of the healthcare system in Jharkhand. Furthermore, assessing the effects of government initiatives, such as the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme, while evaluating care quality, on enhancing healthcare access and affordability in the state yields significant insights into effective strategies and areas necessitating improvement in healthcare policy and execution.

Moreover, investigating the capabilities of telemedicine and digital health solutions in Jharkhand may facilitate improved access to specialist healthcare services, especially in underprivileged areas. Evaluating the viability, acceptability, and efficacy of telemedicine projects in the state may yield significant insights for healthcare planning and resource

distribution. By incorporating these supplementary factors, policymakers and healthcare providers can cultivate a more sophisticated comprehension of the challenges and opportunities for enhancing healthcare availability and accessibility in Jharkhand, ultimately resulting in improved health outcomes and well-being for the populace.

5.3 Objective II: The Trend of Government Expenditure on Healthcare Services in Jharkhand

Government expenditure on healthcare services in Jharkhand has exhibited a steady increase over the years. Data from the Reserve Bank of India reveals that the state's expenditure on medical and public health services increased from Rs. 1,958 crores in 2014-15 to Rs. 3,675 crores in 2020-21, reflecting an approximate growth of 88% over six years. This rise in expenditure signifies the government's endeavors to enhance the availability and accessibility of healthcare services inside the state. Nonetheless, despite this expansion, Jharkhand's per capita healthcare expenditure is inferior to the national average, indicating that there is still potential for enhancement in resource allocation and prioritizing of healthcare within the state's budget. In-depth examination of expenditure patterns across various healthcare sectors, including primary, secondary, and tertiary care, alongside the efficiency and effectiveness of resource allocation, yields critical insights for policy development and execution aimed at improving the overall healthcare system in Jharkhand.

5.3.1 Discussions

The hypotheses most pertinent to the analysis of government expenditure on healthcare services in Jharkhand are as follows:

1. Pareto Optimality Principle: This principle offers a framework for assessing the efficiency of resource distribution. The evaluation of government expenditure on healthcare services in Jharkhand may be conducted to determine if it results in a Pareto optimum outcome, wherein it is unfeasible to enhance the welfare of one individual without detrimentally affecting another. Suboptimal resource allocation in the healthcare system may be rectified through adjustments in government expenditure.

2. Kaldor-Hicks-Pasinetti Efficiency: This notion broadens the Pareto optimality principle by permitting hypothetical compensations. A modification in government spending on healthcare services in Jharkhand may be deemed Kaldor-Hicks-Pasinetti efficient if the benefits to the beneficiaries surpass the detriments to those negatively impacted, regardless of whether any compensation is provided. This criterion may be more relevant in practical policy decisions than rigid Pareto optimality.

3. Principal-Agent Model: The government (principal) allocates resources and finances healthcare services, which are administered by diverse healthcare providers (agents). The trend

in government spending on healthcare services in Jharkhand may be affected by the incentives and oversight systems established between the government and healthcare providers.

4. Health Production Function Model: This model associates health outcomes with many inputs, including healthcare cost. The trend in government spending on healthcare services in Jharkhand can be evaluated regarding its effect on health outcomes, treating healthcare expenditure as an input in the health production function.

The Health Production Function Model and the Grossman Model of Health Demand offer valuable insights for examining the influence of healthcare inputs, such as facilities and personnel, on health outcomes and accessibility. The Principal-Agent Model elucidates the interactions between governmental regulation and healthcare practitioners. The Pareto Optimality Principle prompts inquiries on the effective deployment of resources within the healthcare system.

5.3.2 Results

The economic growth trajectory of Jharkhand from 2013-14 to the expected statistics for 2023-24 illustrates the state's notable resilience, stability, and potential for future development. The consistent rise in the growth rate, especially with the adversities of the COVID-19 epidemic, underscores the efficacy of the state's policies and activities in fostering economic development. The effective execution of the Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) has enhanced the state's advancement by ensuring accessible healthcare for the disadvantaged and elevating the overall health of the populace. The anticipated high growth rates for the forthcoming years suggest that Jharkhand is strategically positioned to attract investments, generate employment opportunities, and improve the standard of living for its residents. To maintain this progress and guarantee equitable development, the state must persist in tackling socio-economic inequities, enhancing healthcare infrastructure, and enacting effective policies that foster sustainable growth. In this manner, Jharkhand can become a paradigm state for economic advancement and social welfare in India, serving as a benchmark for other states to emulate. The state's capacity to surmount hurdles and sustain a steady growth trajectory highlights its significant potential and assures a more promising future for its populace.

5.4 Objective III: Assess the Need of Adoption of PPP Mode in the Healthcare Sector in Jharkhand

Public-Private Partnership (PPP) has surfaced as a viable strategy to tackle the difficulties confronting the healthcare industry in numerous developing nations. Jharkhand, an eastern Indian state, confronts numerous issues in its healthcare industry, including inadequate facilities, insufficient human resources, and financial limitations. The present healthcare

situation in Jharkhand is marked by unequal access to medical treatments, especially in rural regions, attributable to insufficient healthcare infrastructure. Furthermore, the state faces a substantial shortage of healthcare personnel, encompassing physicians, nurses, and specialists, which impedes the provision of quality treatment. The scarcity of public money for healthcare has intensified the issue, leading to insufficient resources for infrastructure development, equipment acquisition, and human resource management.

The use of the PPP model in Jharkhand's healthcare sector offers numerous prospective advantages. Public-private partnerships can enhance healthcare coverage by utilizing private sector resources to develop healthcare facilities in underserved regions, thus improving access to healthcare services. Collaboration with commercial partners can introduce experience, technology, and best practices to improve the quality of healthcare services. Moreover, PPP can enhance efficiency by optimizing resource utilization and fostering innovation in healthcare delivery models. Engagement of the private sector can facilitate the mobilization of supplementary financial resources and guarantee the enduring viability of healthcare initiatives.

Nonetheless, the effective execution of PPP in Jharkhand's healthcare sector necessitates the resolution of several issues and considerations. A comprehensive regulatory framework is essential to provide openness, accountability, and quality assurance in PPP projects. Effective risk distribution between public and private entities is essential to synchronize incentives and guarantee the success of PPP projects. Systematic monitoring and evaluation frameworks must be established to assess the efficacy of PPP initiatives and implement requisite modifications. Involving all pertinent stakeholders, such as healthcare providers, patients, and communities, is crucial to guarantee the acceptability and efficacy of PPP treatments.

5.4.1 Out of Pocket Expenditure in Jharkhand

An extensive analysis of the proportion of total health out-of-pocket expenditure for India and the state of Jharkhand from 2013-14 to 2019-20. During this period, India's proportion of total health out-of-pocket expenditure saw a steady reduction, falling from 64.2% in 2013-14 to 47.1% in 2019-20. Conversely, Jharkhand's percentage demonstrated variability, with a general rise from 2016-17 to 2018-19, peaking at 68.7%, followed by a decline to 64.7% in 2019-20. These findings suggest possible changes in healthcare financing and spending habits in the region. The identified tendencies have substantial economic ramifications, especially on the necessity for Public-Private Partnerships (PPPs) in Jharkhand's healthcare sector. The variations and overall rise in Jharkhand's out-of-pocket healthcare expenditure indicate a possible dependence on private financing, underscoring the necessity of investigating public-private partnership approaches to improve the accessibility and affordability of healthcare services. By utilizing private sector resources and experience, public-private partnerships can tackle economic difficulties related to healthcare provision, enhance infrastructure, service delivery, and overall healthcare outcomes. Moreover, PPPs can facilitate the establishment of sustainable healthcare funding systems, crucial for alleviating out-of-pocket expenses and enhancing equitable access to excellent healthcare services. The implementation of PPPs in Jharkhand's healthcare sector might expand healthcare infrastructure, improve service delivery, and yield superior health outcomes for the people, in accordance with the state's overarching economic development objectives.

5.4.2 Unmet Needs in Jharkhand

The significant unmet needs in family planning in Jharkhand, resulting in detrimental socio-economic and health consequences, can be mitigated by the establishment of Public-Private Partnerships (PPPs). Through collaboration with private healthcare providers, NGOs, and community organizations, the government may enhance the accessibility of family planning services, elevate care quality, and increase awareness of contraceptive options. Public-private partnerships can promote innovation in service delivery, such as the implementation of telemedicine and mobile clinics, to access underserved communities. The juxtaposition of existing and predicted acceptor numbers for spacing and limiting strategies highlights the capacity of PPPs to enhance the adoption of these approaches, hence fostering better mother and child health outcomes and promoting sustainable development. In 2011, the actual number of acceptors for spacing methods in Jharkhand was 0.55, aligning with the anticipated figure; however, the 2022 actual value (0.91) markedly deviated from the expected 1.23. In contrast, the actual growth rate for limiting approaches exceeded forecasts, rising from 0.13 in 2011 to

0.23 in 2022. In India, the actual number of acceptors for spacing methods in 2011 was 31.04, consistent with projections, but the 2022 real figure of 41.70 surpassed the expected 37.92. In terms of limiting approaches, India's actual data were marginally below the estimates, with the real number rising from 5.14 in 2011 to 5.63 in 2022, in contrast to the expected growth from 5.17 to 6.07.

Moreover, in the realm of healthcare, public-private partnerships (PPPs) provide a cooperative strategy to address deficiencies in service delivery, especially in rural regions, and reduce the financial strain on state governments, potentially resulting in a more robust and fair healthcare system. The implementation of PPPs in family planning and healthcare offers a chance for beneficial transformation, tackling the issues encountered by Jharkhand and enhancing the general welfare of its populace.

5.4.3 Discussions

The ideas pertinent to evaluating the necessity of implementing the Public-Private Partnership (PPP) model in Jharkhand's healthcare sector are as follows:

1. Pareto Optimality Principle: This principle offers a framework for assessing the efficiency of resource distribution. The implementation of the PPP model in Jharkhand's healthcare sector can be evaluated based on its potential to achieve a Pareto optimum outcome, wherein no individual can be improved without detriment to another. Should the existing resource allocation in the healthcare system be unsatisfactory, the adoption of the PPP model may be warranted if it enhances the situation without detriment to others.

2. Principal-Agent Model: Within the framework of Public-Private Partnerships (PPPs) in the healthcare sector, the government (principal) engages private healthcare providers (agents) to render services. The necessity of implementing the PPP model in Jharkhand may be driven by the prospects of enhanced incentives and oversight systems between the government and private entities, perhaps resulting in superior healthcare outcomes and more efficiency.

3. Kaldor-Hicks-Pasinetti Efficiency: This notion broadens the Pareto optimality principle by permitting hypothetical compensations. The implementation of the PPP model in Jharkhand's healthcare sector may be deemed Kaldor-Hicks-Pasinetti efficient if the benefits to beneficiaries (such as enhanced healthcare access and improved service quality) surpass the detriments to adversely affected individuals (such as possible public sector job losses), irrespective of any actual compensation. This criterion may be more relevant in practical policy decisions than rigid Pareto optimality.

4. Utility Theory of Value: If the implementation of the PPP model in Jharkhand's healthcare sector results in enhanced health outcomes and greater satisfaction among patients and healthcare providers, it can be contended that this approach elevates the overall utility or well-

being of society. The necessity of implementing the PPP model can be evaluated based on its capacity to optimize societal utility. The discourse analyzes the public-private collaboration in Jharkhand using pertinent theoretical frameworks.

5.4.4 Results

The information regarding out-of-pocket health expenditures in Jharkhand highlights the regressive characteristics of elevated health costs, especially for households in rural or semi-urban areas. The pressing necessity for augmented public investment in healthcare and efficient regulatory frameworks to ensure that quality healthcare is affordable and accessible to all, particularly the impoverished and most vulnerable populations, is clear. The substantial share of out-of-pocket health expenditure, which constitutes a considerable segment of national health expenditure in India, imposes an unequal burden on low-income persons, exacerbating economic inequality and the medical poverty trap. Public-Private Partnerships (PPPs) are crucial in diminishing out-of-pocket expenses by broadening access to healthcare services, especially in rural and isolated regions, while improving the quality of treatment delivered. By utilizing the experience, resources, and efficiency of the private sector, public-private partnerships can enhance government programs, reduce the financial strain on the state, and aid in the development of a more resilient, efficient, and egalitarian healthcare system. The research underscores the imperative for more efficacious treatments and techniques to fulfil the unaddressed requirements in family planning, especially in Jharkhand.

The prospective function of public-private partnerships in enhancing the accessibility of family planning services, elevating care quality, and fostering understanding about contraceptive alternatives is substantial. The persistent pattern of elevated health expenditure in Jharkhand relative to the national average highlights the state government's acknowledgment of the significance of investing in healthcare. To convert this investment into improved health outcomes, using Public-Private Partnerships (PPPs) may be a strategic approach, potentially resulting in a more resilient, efficient, and equitable healthcare system that addresses the population's requirements.

5.5 Objective IV: To Map the Quality Differentials between Public and Private Healthcare Facilities in Jharkhand

5.5.1 Overview

Evaluating and delineating quality discrepancies between public and private healthcare institutions in Jharkhand is crucial for comprehending variations in service delivery and patient experiences. Current measures encompass areas like efficacy, safety, timeliness, patient-centeredness, efficiency, and equity of care, emphasizing the enhancement of quality, safety,

accessibility, and affordability of healthcare for all individuals. Research has revealed discrepancies in the accessibility of assistive devices and treatment efficacy across public and private facilities, underscoring the necessity for systematic evaluation and benchmarking of care quality. The longitudinal analysis of healthcare service utilization has elucidated service quality characteristics, highlighting the necessity for tailored efforts to address quality disparities. Delivering great services necessitates effective government, a proficient healthcare personnel, suitable financial frameworks, and accessible medical facilities. By utilizing such data and situational analysis, Jharkhand can formulate focused policies to address the quality disparities between public and private healthcare institutions, hence enhancing healthcare delivery and patient outcomes.

5.5.1.1 Discussion

H_1: The quality of healthcare facilities/services provided by private entities is better than those provided by the public entities/healthcare system/network.

The subsequent theories appear to align effectively with the proposed hypothesis:

1. The Pareto Optimality Principle asserts that a resource distribution is efficient if it is impossible to improve one individual's situation without detrimentally affecting another's. This theory posits that in healthcare, if private facilities offer superior services compared to public ones, enhancing the quality of public facilities may necessitate a decline in the quality of private facilities, given the constraint of limited resources. Nonetheless, attaining Pareto optimality does not inherently imply that the result is socially desirable or equitable.
2. Utility Theory of Value: The utility theory of value asserts that the worth of a commodity or service is dictated by its utility to the consumer. If patients believe that private healthcare facilities provide greater utility (regarding quality, convenience, or other characteristics) than public facilities, they may be inclined to pay a premium for private healthcare services. This argument may elucidate why private healthcare institutions tend to offer superior quality treatments, as they possess an incentive to optimize patient utility to attract and keep clientele.
3. The principal-agent paradigm delineates a scenario in which one entity (the principal) assigns tasks to another entity (the agent), although their goals may not be entirely congruent. In healthcare, the government (principal) may engage private healthcare providers (agents) to render services. If the incentives for private providers are designed to encourage quality enhancements, they are more likely to invest in superior facilities, technology, and personnel, resulting in greater quality care than public facilities.
4. Bounded Rationality: The idea of bounded rationality posits that decision-makers possess constrained cognitive capacities and frequently base their conclusions on partial information

or heuristics. Patients may opt for private healthcare facilities over public ones due to perceived disparities in quality, regardless of the accuracy of their impressions or their lack of comprehensive information regarding the quality of care offered by various facilities.

5. Social Norms: Social norms can affect healthcare decisions, as individuals may choose private healthcare institutions if they perceive these establishments as linked to elevated social status or if their peers and family utilize private services. This hypothesis posits that the perceived disparity in quality between private and public healthcare facilities may be shaped by social and cultural influences, rather than exclusively by objective quality metrics.

The null hypothesis posited that there is no disparity in the quality of healthcare facilities and services offered by private businesses in comparison to public institutions. Consequently, the outcome may diverge from the predictions of some theories.

1. Pareto Optimality Principle: If private healthcare were genuinely more efficient than public healthcare, a notable disparity in quality would be anticipated. Nonetheless, an inconsequential outcome indicates a potential absence of a distinct efficiency benefit for private facilities.

2. Utility Theory of Value: Should patients feel greater utility from private healthcare, a notable disparity in quality may be anticipated. The negligible outcome indicates that patients may not reliably view private institutions as providing superior quality utility.

3. Principal-Agent Model: Should incentives for private providers effectively enhance quality, a notable disparity would be anticipated. The negligible outcome indicates that the incentive frameworks may not be facilitating quality enhancements as theorized.

4. Bounded Rationality and societal Norms: These theories may elucidate the negligible outcome, since patients' perceptions and decisions might not consistently correspond with actual quality disparities due to cognitive constraints and societal pressures.

The negligible finding and inability to reject the null hypothesis indicate that the observed data did not furnish compelling evidence for a quality disparity between private and public healthcare facilities, which may be surprising given some theoretical predictions.

5.5.1.2 Justification for acceptance or rejection of hypotheses

The multiple linear regression model proposed seeks to evaluate the perceived quality score based on treatment at a private healthcare facility, taking into account patient and hospital attributes. The coefficient of the dummy variable 'private' signifies that the perceived quality score is 17.3% greater for private hospitals in comparison to public hospitals; nonetheless, this result is statistically insignificant. The analysis indicates that the quality score is adversely influenced by the private-public hospital mix in the vicinity, male gender, and older age demographics, but these impacts are statistically negligible. The sole statistically significant effect is the total number of hospitals within a 5-kilometer radius catchment region, which

exerts a modest but favourable influence on quality ratings, likely attributable to increased competition among the hospitals.

The evaluation of the coefficient of the dummy variable 'private' is essential in ascertaining if private hospitals are seen as providing superior healthcare services compared to public hospitals. The statistically insignificant coefficient indicates insufficient evidence to substantiate the assertion that private hospitals are seen as providing superior healthcare services compared to public hospitals. This corresponds with the concepts of hypothesis testing, wherein the null hypothesis remains unrefuted when the evidence fails to substantiate the alternative assertion. The negligible influence of additional variables further underscores the absence of statistical significance in the perceived quality score, reaffirming the conclusion that there is insufficient evidence to substantiate the premise that private hospitals provide superior healthcare services compared to public hospitals. The absence of statistical significance in the coefficients suggests insufficient evidence to substantiate the assertion that private hospitals are seen as providing superior healthcare services compared to public hospitals, resulting in the failure to reject the null hypothesis.

The identical multiple linear regression model is employed to analyze the findings for the two specific departments of General Medicine and ENT. The analysis for General Medicine demonstrates that public hospitals outperform private hospitals, with a significant p-value of 0.00 at a 0.05 significance level, indicating robust evidence against the null hypothesis. The ENT study indicates that private hospitals outperform public hospitals, evidenced by a significant p-value of 0.023 at a 0.05 significance level, which contradicts the null hypothesis. Despite the p-value being marginally above the conventional 0.05 threshold, it nonetheless offers evidence against the null hypothesis, reinforcing the assertion that private hospitals outperform public hospitals in ENT. This analysis yields significant insights into the perceived quality of healthcare services across various departments and the potential disparities between private and public hospitals.

5.5.1.3 Results

Alternate Hypothesis	Accepted/Rejected
The quality of healthcare facilities/services provided by private entities is better than those provided by the public entities/healthcare system/network.	Rejected

5.5.1.4 Discussion

H2: The proportion of patients who rank the quality of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital.

The subsequent theories appear to align effectively with the proposed hypothesis:

1. Utility Theory of Value: This theory posits that the value of a good or service is contingent upon its benefit to the consumer. In healthcare, if patients believe that private hospitals provide superior quality of treatment compared to public hospitals, they may assess the quality of care in private hospitals as higher. The search findings indicate that patients at private hospitals may possess elevated expectations, and that physicians in these facilities may be more predisposed to address patient inquiries and offer comprehensive explanations, which could result in enhanced patient satisfaction and perceived quality of care.

2. Social Norms: Social norms might affect patients' views and expectations regarding the quality of treatment. If societal consensus favors the notion that private hospitals offer superior care, patients may tend to assess the quality of care in private hospitals as favorable, regardless of the absence of objective disparities in quality between public and private hospitals. The search results indicate that patients' awareness of their rights and expectations can affect their impressions of the quality of medical treatments.

3. Bounded Rationality: Patients' assessments of healthcare quality may be affected by cognitive constraints and insufficient knowledge. Patients may lack access to extensive data on objective quality metrics and may depend on heuristics or personal experiences to shape their perceptions. The search results indicate that current quality measures predominantly emphasize efficacy and safety, with fewer metrics addressing efficiency and equity in care. This indicates that patients' evaluations may not consistently correspond with objective quality metrics.

4. Principal-Agent Model: In healthcare, the government (principal) may engage private hospitals (agents) to provide services. If the incentives for private hospitals are designed to reward patient satisfaction and perceived quality of care, they are more likely to invest in facilities, communication, and other variables that affect patients' quality rankings. The search results indicate that public disclosure of survey outcomes, such as the HCAHPS survey, may incentivize hospitals to enhance the quality of care.

Although these theories elucidate why patients might perceive the quality of care in private hospitals as superior to that in public hospitals, it is crucial to acknowledge that the correlation between hospital ownership and patient-reported quality is intricate and may be affected by numerous factors, including patient demographics, hospital resources, and regional healthcare policies.

Disavowing the null hypothesis indicates that the proportion of patients rating the quality of care as satisfactory is, in fact, greater in private hospitals compared to public hospitals. This result corresponds with the anticipated outcomes of the aforementioned theories:

1. Utility Theory of Value: If patients sense greater benefit from private hospitals about the quality of care, they are more inclined to assess the quality of care in private hospitals as favorable. The notable outcome corroborates this notion, indicating that patients may regard private hospitals as providing superior quality of care.
2. Social Norms: Should a dominant social norm suggest that private hospitals deliver superior quality of treatment, patients may be more predisposed to evaluate the quality of care in private hospitals favorably. The notable outcome aligns with this notion, suggesting that societal norms may affect patients' evaluations of healthcare quality.
3. Principal-Agent Model: When incentives for private hospitals are designed to prioritize patient satisfaction and perceived quality of care, they are more inclined to invest in elements that affect patients' assessments of quality. The notable finding indicates that private hospitals may be reacting to these incentives, resulting in elevated patient assessments of quality.
The theory of Bounded Rationality posits that patients' evaluations may not consistently correspond with objective quality metrics due to cognitive constraints and insufficient knowledge. The notable result suggests a disparity in patient ranks; nevertheless, it does not inherently indicate real differences in quality between public and private institutions. The substantial outcome and rejection of the null hypothesis align with the anticipations of the Utility Theory of Value, Social Norms, and Principal-Agent Model. These theories offer possible explanations for why patients could assess the quality of care in private hospitals as superior than that in public hospitals. Nonetheless, the idea of Bounded Rationality cautions us to interpret patient rankings with care, as they may not consistently represent actual quality disparities.

5.5.1.5 Justification for acceptance or rejection of hypotheses

A Z-test of proportions was employed to evaluate patient evaluations of care quality between private and public hospitals, categorizing scores at or above the 75th percentile as 'excellent'. The findings indicated that patients at public hospitals were more inclined to assess services negatively, whereas those in private hospitals tended to evaluate them positively. The disparity in proportions was statistically significant, offering robust evidence to substantiate the hypothesis that a greater percentage of private hospital patients assess care quality as good in comparison to public hospital patients. The application of a standardized criterion for 'good' ratings and the statistical significance of the findings enhance the validity of this conclusion, consistent with the principles of hypothesis testing and illustrating a significant disparity in perceived care quality between private and public hospitals.

5.5.1.4 Results

Alternate Hypothesis	Accepted/Rejected
The proportion of patients who rank the quality of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital.	Accepted

5.5.1.5 Discussion

H_{2A}: Safety aspect of Quality differential- Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals.

The subsequent hypotheses appear to align effectively with the notion of safety as a component of quality.

1. The Principal-Agent Model posits that if the government (principal) structures incentives for private hospitals (agents) to reward patient safety and the establishment of effective error prevention systems, private hospitals may be more inclined to invest in these domains. This may create the impression that private hospitals possess superior safety protocols and systems in comparison to public hospitals.

2. Social Norms: If a dominant societal attitude exists that private hospitals offer superior quality of care, particularly regarding safety, both consumers and healthcare providers may be inclined to view private hospitals as possessing more effective error avoidance systems and protocols. Social norms might affect perceptions despite the absence of objective differences in safety protocols between public and private hospitals.

3. Bounded Rationality: The judgments of patients and providers on safety procedures and systems may be affected by cognitive constraints and insufficient knowledge. Individuals may depend on heuristics or personal experiences to shape their judgments, thus resulting in the belief that private hospitals provide superior safety protocols, despite a lack of objective data to substantiate this view.

4. Utility Theory of Value: If patients and healthcare providers see that private hospitals give greater utility for patient safety and mistake mitigation, they may be more inclined to assume that private hospitals possess superior methods and systems. The perception of enhanced utility may be affected by elements such as the physical environment, technology, and personnel training in private hospitals.

The null hypothesis posited that there is no disparity in the perception of safety-related quality features, such as error prevention processes and systems, between private and public hospitals. This result may align with some theories:

1. Bounded Rationality: This theory posits that the perceptions of safety procedures and systems by patients and providers may be affected by cognitive constraints and insufficient

knowledge. A negligible outcome corresponds with the anticipation that there may be no distinct disparity in perceptions between hospital types owing to these constraints.

2. Social Norms: In the absence of a robust societal conviction that private hospitals offer superior safety and quality compared to public hospitals, an inconsequential outcome would align with this lack of a strong social norm.

Nonetheless, the negligible outcome may diverge from the anticipations of the subsequent theories:

1. Principal-Agent Model: Should this theory anticipate that incentives for private hospitals will enhance safety protocols and systems, an insignificant outcome would contradict this expectation, indicating no substantial disparity in safety perceptions between hospital types.

2. Utility Theory of Value: Should this theory suggest that patients and healthcare providers perceive greater utility regarding patient safety and error prevention in private hospitals, an insignificant result would contradict this expectation, indicating no meaningful difference in perceptions.

The negligible outcome and the inability to reject the null hypothesis align with the principles of Bounded Rationality and the lack of a robust social norm. Nevertheless, the outcome diverges from the anticipations of the Principal-Agent Model and Utility Theory of Value, which would forecast a substantial disparity in safety perceptions between public and private hospitals.

5.5.1.6 Justification for acceptance or rejection of hypotheses

A Z test of proportions evaluated patient safety ratings in private versus public hospitals, categorizing results at or above the 75th percentile as ‘excellent’. Findings indicated that patients at public hospitals were more inclined to assess safety negatively, whereas patients in private hospitals tended to evaluate it positively. Nonetheless, the disparity in proportions was statistically negligible. This indicates a lack of adequate data to substantiate the premise that a greater percentage of private hospital patients assess safety as favorable in comparison to public hospital patients. The absence of statistical significance, although employing a standardized criterion, suggests no substantial difference in perceived safety between private and public hospitals. Therefore, the null hypothesis remains unrefuted, and the assertion that private hospitals possess a greater proportion of favorable safety ratings is not substantiated by the evidence.

5.5.1.7 Results

Alternate Hypothesis	Accepted/Rejected

Safety aspect of Quality differential- Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals.	Rejected

5.5.1.8 Discussion

H_{2B}: Patient Centredness aspect of Quality differential- Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals than in public hospitals. The subsequent theories appear to correlate effectively.

1. Utility Theory of Value: This theory posits that if patients sense greater benefit from reduced waiting times for medical consultations in private hospitals, they may be more inclined to regard private hospitals as providing superior patient-centered care. The sense of enhanced utility may result in a preference for private hospitals instead of public hospitals.

2. Principal-Agent Framework: In the realm of healthcare, the government (principal) may engage private hospitals (agents) to provide services. If the incentives for private hospitals are designed to reward reduced waiting times and enhanced patient-centered care, they are likely to prioritize these elements. This may create the impression that private hospitals provide lower waiting times for medical consultations than public hospitals.

3. Social Norms: If a dominant societal notion exists that private hospitals offer superior patient-centered treatment, characterized by reduced waiting times for consultations, patients may be inclined to view private hospitals as advantageous in this regard. Social norms can shape perceptions despite the absence of objective disparities in waiting times between public and private hospitals.

The hypothesis was statistically significant, indicating the null hypothesis was rejected. This outcome corresponds with the anticipations of certain theories:

1. Utility Theory of Value: The notable finding indicates that patients associate more utility with reduced waiting times for medical appointments in private hospitals. This perception of increased utility may result in a preference for private hospitals over public hospitals.

2. The Principal-Agent Model indicates that if the government (principal) designs incentives for private hospitals (agents) to prioritize shorter waiting times and enhanced patient-centered care, these hospitals are more likely to emphasize these factors, resulting in a perception of reduced waiting times for doctor visits relative to public hospitals.

3. Social Norms: The notable outcome corresponds with the notion that if a dominant societal belief exists that private hospitals offer superior patient-centered care, such as reduced waiting times for consultations, patients may be more inclined to view private hospitals as advantageous in this regard.

The substantial outcome and the dismissal of the null hypothesis indicate that the observed data furnish compelling evidence in favor of the alternative hypothesis, which asserts that waiting times for doctor appointments are seen as shorter in private hospitals compared to public hospitals.

This result aligns with the anticipations of the Utility Theory of Value, Principal-Agent Model, and Social Norms theories.

5.5.1.9 Justification for acceptance or rejection of hypotheses

A Z test of proportions compared patient ratings of Patient Centredness in private and public hospitals, utilizing scores at or above the 75th percentile as indicative of 'good' performance. Findings indicated that patients at public hospitals were more inclined to assess Patient Centredness negatively, whereas patients in private hospitals tended to evaluate it positively. The disparity in proportions was statistically significant, offering robust evidence to substantiate the hypothesis that a greater proportion of private hospital patients evaluate Patient Centredness as favorable in comparison to public hospital patients. The application of a standardized criterion and the statistical significance of the findings reinforce this conclusion, demonstrating a significant disparity in perceived Patient Centredness between private and public institutions. This is consistent with the principles of hypothesis testing, reinforcing the alternative hypothesis that private hospitals exhibit a greater proportion of favorable Patient Centredness ratings.

5.5.1.10 Results

Alternate Hypothesis	Accepted/Rejected
Patient Centeredness aspect of Quality differential- Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals than in public hospitals.	Accepted

5.5.1.11 Discussion

H_{2C}: Effectiveness aspect of Quality differential- Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals. The subsequent theories appear to correlate effectively.

1. Utility Theory of Value: If patients think that physicians and nursing personnel at private hospitals deliver superior utility regarding competence and efficacy, they may be more inclined to assume that private hospitals provide higher quality care. This notion of enhanced usefulness may result in a preference for private hospitals over public hospitals.

2. Principal-Agent Model: In healthcare, the government (principal) may engage private hospitals (agents) to provide services. If the incentives for private hospitals are designed to

promote the recruitment and retention of more proficient doctors and nursing staff, private hospitals may be viewed as having a competitive edge over public hospitals in this regard.
3. Social Norms: If societal consensus suggests that private hospitals recruit and retain more proficient physicians and nursing personnel, patients may be inclined to view private hospitals as superior in effectiveness and quality of care. Social norms can shape perceptions despite the absence of objective disparities in staff competency between public and private hospitals.

The hypothesis was statistically significant, indicating the rejection of the null hypothesis. This outcome corresponds with the theoretical expectations.
1. Utility Theory of Value: The notable finding indicates that patients attribute greater usefulness to the proficiency and efficacy of physicians and nursing personnel in private hospitals. This perception of increased utility may result in a preference for private hospitals over public hospitals.
2. The Principal-Agent Model indicates that if the government (principal) designs incentives for private hospitals (agents) to promote the recruitment and retention of more skilled doctors and nursing staff, private hospitals may be viewed as superior to public hospitals in this regard.
3. Social Norms: The notable outcome corresponds with the notion that if a dominant societal belief exists that private hospitals recruit and employ more proficient physicians and nursing personnel, patients may be more inclined to view private hospitals as superior in effectiveness and quality of care.

5.5.1.12 Justification for acceptance or rejection of hypotheses

A Z test of proportions compared patient ratings of Patient Centredness in private and public hospitals, utilizing scores at or above the 75th percentile as indicative of 'good' performance. Findings indicated that patients at public hospitals were more inclined to assess Patient Centredness negatively, whereas patients in private hospitals tended to evaluate it positively. The disparity in proportions was statistically significant, offering robust evidence for the hypothesis that a greater proportion of private hospital patients evaluate Patient Centredness as favorable in comparison to public hospital patients. The standardized criterion and statistical significance reinforce this conclusion, signifying a substantial difference in perceived Patient Centredness between private and public hospitals. This corroborates the alternative hypothesis that private hospitals exhibit a greater proportion of favorable Patient Centredness ratings, consistent with the principles of hypothesis testing.

5.5.1.13 Results

Alternate Hypothesis	Accepted/Rejected
Effectiveness aspect of Quality differential- Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals.	Accepted

5.5.1.14 Discussion

H_{2D}: The mean sentiment score of private hospitals is greater than that of public hospitals.

The Health Production Function Model aligns most effectively with the theory. This model examines the impact of diverse inputs on health outcomes, facilitating comparisons between various healthcare providers, such as commercial and public institutions. It corresponds effectively with the hypothesis by analyzing elements that affect care quality and patient impressions, which are probably manifested in sentiment scores. The model also accounts for efficiency in resource utilization, which may elucidate the proposed elevated sentiment scores in private hospitals. The Health Production Function Model offers the most direct framework for analyzing and understanding the disparity in sentiment scores between private and public hospitals, as posited by the hypothesis.

Although theories such as the Principal-Agent Model and the Pareto Optimality Principle possess some relevance to the hypothesis, they do not correspond as closely with the specific comparison of sentiment scores between private and public hospitals as the Health Production Function Model does.

The statistically significant outcome that refutes the null hypothesis is consistent with the Health Production Function Model. This model analyzes the impact of different inputs on health outcomes, and the notable disparity in sentiment scores between commercial and public hospitals indicates major differences in their health production methodologies. The approach emphasizes the comparison of efficiency and effectiveness among healthcare providers, as evidenced by the elevated sentiment scores for private hospitals, which may suggest superior resource use or enhanced management techniques. The model also takes into account other factors affecting health outcomes, such as socioeconomic, lifestyle, and environmental elements, which may elucidate the observed discrepancies in sentiment scores. The notable finding indicates a substantial disparity in perceived quality of care between private and public hospitals, consistent with the model's focus on the impact of various inputs on health outcomes. Consequently, the statistically significant result corroborates the Health Production Function Model's predictions regarding diverse health outcomes and patient perceptions among various healthcare providers.

5.5.1.15 Justification for acceptance or rejection of hypotheses

The comparison of sentiment scores between private and public hospitals produced statistically significant findings. With 369 degrees of freedom and a 5% significance level, the computed t-statistic surpassed the crucial value of 1.960, resulting in the rejection of the null hypothesis. This result demonstrates that the average sentiment score for private hospitals is considerably greater than that of public hospitals. The positive disparity in mean sentiment scores indicates that private hospitals typically garner more favorable evaluations than public hospitals. This research offers empirical evidence of a notable disparity in patient opinions between the two categories of healthcare institutions, with private hospitals regularly receiving more favorable feedback. This corroborates the alternative hypothesis and is consistent with the concepts of hypothesis testing.

5.5.1.16 Results

Null Hypothesis	Accepted/Rejected
The mean sentiment score of private hospitals is greater than that of public hospitals.	Accepted

5.5.1.17 Discussion

H_3: The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital. The subsequent theories appear to correlate effectively.

1. Utility Theory of Value: Should Medicare personnel ascertain that private hospitals offer superior utility regarding treatment quality, they may be inclined to evaluate the quality of care in private hospitals more favorably than in public hospitals. This notion of increased utility may result in a greater percentage of Medicare personnel rating private hospitals positively.
2. Principal-Agent Framework: In the realm of healthcare, the government (principal) may engage private hospitals (agents) to provide services. If the incentives for private hospitals are designed to reward superior quality of treatment, Medicare staff may view private hospitals as delivering higher quality services, resulting in a greater proportion ranking them favorably in comparison to public hospitals.
3. Social Norms: Should there be a dominant perception among Medicare personnel that private hospitals deliver superior quality of treatment, they may be predisposed to assign a more favorable ranking to private hospitals. Social norms can shape views,

resulting in a greater percentage of Medicare personnel rating the quality of care as favorable in private hospitals relative to public hospitals.

4. The Pareto Optimality Principle asserts that a resource allocation is ideal if no individual can be improved without disadvantaging another, and it does not directly relate to the specific hypothesis of Medicare staff rankings. Nonetheless, if the superior perceived quality of care in private hospitals results from a more effective resource allocation, it may be contended that this corresponds with the Pareto Optimality Principle.

The hypothesis was statistically significant, indicating the rejection of the null hypothesis. This outcome corresponds with the anticipations of certain theories:

1. The Utility Theory of Value indicates that Medicare personnel recognize greater utility about quality of care in private hospitals relative to public hospitals. This notion of increased utility may result in a greater percentage of Medicare personnel rating private hospitals positively.
2. The Principal-Agent Model indicates that if the government (principal) structures incentives for private hospitals (agents) to reward superior quality of care, Medicare staff may view private hospitals as delivering higher quality care, resulting in a greater proportion ranking them more favorably than public hospitals.
3. Social Norms: The notable outcome corresponds with the notion that if Medicare personnel mostly believe that private hospitals offer superior quality of care, they may be more inclined to assign favorable rankings to private hospitals.

Rejecting the null hypothesis indicates substantial evidence in favor of the alternative hypothesis, which posits that the proportion of Medicare personnel rating the quality of care as good is greater in private hospitals compared to public hospitals. This result aligns with the anticipations of the Utility Theory of Value, Principal-Agent Model, and Social Norms theories.

5.5.1.18 Justification for acceptance or rejection of hypotheses

A Z test of proportions evaluated nursing staff assessments of care quality in private versus public hospitals, employing the 75th percentile as the threshold for ‘good’. Results indicated that a majority of nurses assessed service quality as poor, with a higher percentage in public hospitals (about 70%) compared to private hospitals (51%). A greater percentage of nurses in private hospitals assessed procedures as good in comparison to their counterparts in public hospitals, with the difference being statistically significant. This offers compelling data supporting the idea that a greater percentage of nursing personnel in private hospitals assess care quality as satisfactory compared to their counterparts in public hospitals. The standardized criterion and statistical significance reinforce this conclusion, signifying a substantial

difference in reported treatment quality among nursing staff in private versus public hospitals. This corroborates the alternative hypothesis and is consistent with the concepts of hypothesis testing.

5.5.1.19 Results

Alternate Hypothesis	Accepted/Rejected
The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital.	Accepted

5.6 Theoretical Implications and Practical Implications: Effects on future research, policy formation, and actions

Theoretical and practical implications resulting from research on the quality differential in healthcare delivery through Public-Private Partnerships (PPP) have far-reaching effects on future research, policy formation, and actions within the healthcare sector. Understanding the theoretical implications of such research provides insights into the underlying mechanisms and factors influencing the quality of care in PPP healthcare delivery models, while the practical implications offer guidance for policymakers and stakeholders to shape effective policies and initiatives.

5.6.1 Theoretical Implications

Theoretical implication refers to newly discovered contributions to current theories or foundational elements for the development of new theories (Oni, 2018). Certain findings of this investigation corroborate the established research outcomes. This work seems to be the inaugural investigation in this domain. The principal findings of this study have introduced a new perspective to the challenges and aims examined.

Through a comprehensive literature analysis utilizing many databases, including PubMed, Scopus, Web of Science, Google Scholar, ScienceDirect, CINAHL, PsycINFO, and JStor, the study's results corroborate and expand upon the current studies about disparities in healthcare quality:

I. Affirmations:
   a. The absence of substantial quality disparities between public and private hospitals under the AB-PMJAY scheme corresponds with research from other low- and middle-income countries (LMICs), which reported inconsistent outcomes when evaluating care quality across ownership categories (Berendes et al., 2011; Basu et al., 2012; Kruk et al., 2018).

b. The affirmative correlation between increased competition and perceived quality ratings supports findings from research conducted in the US and UK, which indicated that competition enhances quality outcomes (Cooper et al., 2011; Gaynor et al., 2013; Bloom et al., 2015).

II. New Findings:

a. The significance of incorporating both patient and provider viewpoints in evaluating healthcare quality, as evidenced by the study, is corroborated by research highlighting the multi-faceted nature of quality and the necessity for thorough assessments. However, this is among the first studies to empirically examine healthcare quality from both the demand side (patient perspective) and supply side (caregiver perspective) (Donabedian, 1988; Hanefeld et al., 2017; Akachi & Kruk, 2017).

b. This study is among the initial investigations to furnish empirical evidence regarding healthcare quality disparities under the AB-PMJAY scheme in Jharkhand, India, thereby addressing a significant void in the literature concerning universal health coverage initiatives in resource-limited environments (Rao et al., 2014; Prinja et al., 2017).

c. The discrepancy between regression and Z-test outcomes in the study underscores the constraints of linear model specifications in encapsulating the multi-dimensionality of healthcare quality perceptions, indicating the necessity for additional research employing non-linear and quantile regression methodologies (Koenker & Hallock, 2001).

d. The findings regarding the potential of public-private partnerships (PPPs) to enhance healthcare access and quality in disadvantaged regions of Jharkhand contribute to the sparse research base about the efficacy of PPPs within the Indian healthcare framework (Raman & Björkman, 2009; Baliga et al., 2020).

e. The study's findings on the intricate market dynamics that transcend a mere public-private dichotomy, highlighting competition's role in enhancing quality, inform the ongoing discourse regarding the optimal balance of public and private provision for attaining universal health coverage (Mackintosh et al., 2016; McPake & Hanson, 2016).

f. This study offers a thorough evaluation of the effects of AB-PMJAY on healthcare availability, accessibility, affordability, and quality in Jharkhand, a comprehensive analysis that is uncommon in the current literature, which typically emphasizes isolated aspects of health system performance (Rao et al., 2014; Prinja et al., 2017).

The comprehensive literature evaluation from several databases underscores the importance of the study in validating major findings from prior research while offering new insights into healthcare quality disparities within the framework of AB-PMJAY in Jharkhand. The study identifies significant deficiencies in existing literature, presents methodological ideas, and supplies evidence to guide policy debates about the contributions of public and private providers to universal health care in resource-limited environments.

5.6.2 Implications for Government Ministries, Departments and Administrations

The study's results indicate that public-private partnerships (PPPs) could enhance healthcare access and quality in underserved regions of Jharkhand, recommending that government bodies prioritize the development and reinforcement of PPPs in the healthcare domain. This can be accomplished by developing a conducive regulatory framework, offering incentives for private sector involvement, and instituting explicit standards for the implementation and monitoring of PPPs, which is essential for the success of PPPs under the AB-PMJAY plan. Government ministries and agencies must guarantee equitable access to healthcare services for all beneficiaries, irrespective of their socioeconomic level or geographic location, by implementing targeted outreach and enrolment methods. To attain enduring impact and sustainability, it is crucial to synchronize incentives and rewards with health outcomes and quality of care, rather than merely the quantity of services rendered. Establishing robust monitoring and evaluation mechanisms to assess the performance of PPPs, pinpoint areas for enhancement, and guarantee ongoing quality improvement is essential.

Ultimately, collaborating with local communities and civil society organizations to ensure that public-private partnerships (PPPs) address the needs and preferences of beneficiaries, while also enhancing awareness and trust in the initiative, can cultivate a sense of ownership and accountability among all stakeholders (Raman & Björkman, 2009; Baliga et al., 2020).

Furthermore, the study emphasizes the significance of competition in fostering quality enhancements within the healthcare sector. Government ministries and agencies ought to contemplate policies that foster healthy competition among healthcare providers, including transparent quality reporting, performance-based incentives, and efficient licensing procedures. The government can enhance quality and efficiency among providers by cultivating a competitive market environment (Mackintosh et al., 2016; McPake & Hanson, 2016).

The research underscores the need of incorporating both patient and provider viewpoints in evaluating healthcare quality. Government ministries and departments ought to establish comprehensive quality evaluation frameworks that encompass several dimensions of

quality, including clinical outcomes, patient satisfaction, and provider competence (Donabedian, 1988; Hanefeld et al., 2017; Akachi & Kruk, 2017). Consistent assessment and evaluation of healthcare quality among public and private providers can pinpoint areas for enhancement and guide policy formulation.

The study's findings about the limitations of linear model specifications in representing the multi-dimensionality of healthcare quality perceptions highlight the necessity for more research employing sophisticated methodological techniques. Government ministries and departments ought to endorse and finance research programs that tackle significant deficiencies in the literature about healthcare quality disparities and universal health coverage efforts in resource-limited environments (Rao et al., 2014; Prinja et al., 2017). Collaborations among government agencies, academic institutions, and research organizations can produce evidence to guide policy decisions.

5.6.3 Implications for Hospital Managements

Executing the aforementioned consequences necessitates sufficient competence and resources among governmental ministries, departments, and administrations. Policymakers ought to focus capacity-building activities, including training programs for hospital administrators, quality improvement specialists, and public-private partnership managers. Effective resource allocation and budgeting mechanisms must be established to guarantee adequate financing and support for healthcare quality improvement efforts (Rao et al., 2014; Prinja et al., 2017). To enhance the quality and accessibility of healthcare in India, government ministries, departments, and administrations must implement a multifaceted strategy that utilizes ideas from many theoretical frameworks and economic models. This encompasses enhancing the execution and oversight of quality improvement initiatives such as Total Quality Management, broadening the scope and advantages of the PM-JAY health insurance scheme, investing in the development and standardization of patient-reported experience and outcome metrics, promoting and incentivizing public-private partnerships, initiating public awareness campaigns, fortifying the capabilities of regulatory bodies, and investing in the training and ongoing professional development of healthcare personnel. Implementing these policy recommendations will enable government entities to tackle critical issues, including inequities in healthcare access and quality, the necessity for patient-centered care, and the opportunities presented by public-private partnerships, thus enhancing the overall healthcare environment in the nation.

Nevertheless, significantly more efforts are required to guarantee that the PM-JAY system provides high-quality healthcare services to all beneficiaries. To enhance the quality of healthcare under the ABPMJAY plan in Jharkhand, government ministries, departments, and

administrations must implement a multifaceted strategy. This entails enhancing the capabilities and motivation of healthcare personnel by training, mentoring, and supportive supervision, in addition to provide sufficient resources and incentives for quality enhancement. Enhancing the infrastructure and resources of healthcare facilities, particularly the accessibility of vital medications, diagnostic assessments, and referral services, is imperative. Furthermore, improving patient participation and empowerment through the provision of information and education regarding their rights and entitlements, involving them in decision-making processes, and soliciting their feedback and grievances can lead to an enhanced quality of treatment.

Implementing comprehensive monitoring and evaluation systems that utilize standardized indicators and methodologies to assess care quality, identify deficiencies and exemplary practices, and guide quality enhancement initiatives is crucial. Fostering a culture of quality and safety that prioritizes continuous learning, innovation, and responsibility, while encouraging collaboration and teamwork among healthcare practitioners, administrators, and patients, can significantly improve treatment quality. Addressing social determinants of health, including poverty, education, and gender, which affect care quality and health outcomes, necessitates intersectoral collaboration and community involvement.

Consequently, by addressing these implications, government ministries, departments, and administrations can utilize the insights from the study and the broader literature to enhance healthcare quality, access, and equity within the AB-PMJAY plan in Jharkhand and other resource-limited contexts. An integrated strategy that includes PPP enhancement, competition facilitation, quality evaluation, research assistance, and capacity development can aid policymakers in addressing the intricate difficulties of healthcare quality enhancement and advancing towards universal health coverage objectives.

5.6.4 Implications for Universities and Research Institutions

Universities and research institutes play a vital role in mitigating quality disparities in healthcare delivery via public-private partnerships (PPPs). They ought to participate in collaborative research to create and assess innovative PPP models that tackle disparities in healthcare quality. The research must concentrate on finding optimal practices, lessons acquired, and trends in healthcare public-private partnerships, alongside formulating criteria for effective implementation. Through collaboration with government entities, industry, and other stakeholders, universities can aid in the creation of evidence-based public-private partnership models that enhance the quality and accessibility of healthcare services. Due to the intricacies of healthcare public-private partnerships, universities and research institutions ought to embrace an interdisciplinary methodology in their research, using

knowledge from several domains including health management, economics, public policy, and social sciences. This method can yield a more thorough comprehension of the determinants affecting the efficacy of healthcare public-private partnerships and the processes by which they influence healthcare quality and results.

Furthermore, colleges and research organizations must to allocate resources towards establishing rigorous procedures for assessing quality disparities in healthcare delivery via public-private partnerships (PPPs). This may entail modifying existing quality measurement frameworks, such as the HEALTHQUAL framework, to suit the particular context of PPPs. Researchers ought to investigate novel methodologies for data collecting and analysis, including patient-reported experience and outcome measures (PREMs and PROMs), to assess the influence of PPPs on healthcare quality from the viewpoint of service users.

Universities and research institutions can significantly contribute to enhancing capacity for quality improvement in healthcare public-private partnerships by offering training and education to healthcare practitioners, policymakers, and other stakeholders. This may entail creating specialist seminars, workshops, and certification programs centered on quality improvement approaches, including Total Quality Management (TQM) and Continuous Quality Improvement (CQI). By providing stakeholders with the requisite information and skills to execute and maintain quality improvement efforts, universities can enhance the enduring success of healthcare public-private partnerships.

Moreover, universities and research organizations must to proactively facilitate the translation and dissemination of research findings about healthcare public-private partnerships to improve policy and practice. This may entail interacting with legislators, healthcare professionals, and the public via several avenues, including policy briefings, workshops, and media outreach. By promoting the integration of research findings into decision-making processes, universities may ensure that healthcare public-private partnerships are structured and executed to optimize their capacity to enhance healthcare quality and outcomes.

In summary, universities and research institutions are essential in mitigating quality disparities in healthcare delivery via public-private partnerships. Through collaborative and interdisciplinary research, the establishment of rigorous methodologies for quality measurement, the enhancement of capacity for quality improvement, and the facilitation of knowledge translation and dissemination, universities can advance the creation of evidence-based public-private partnership models that enhance the quality and accessibility of healthcare services for all.

5.7 Contributions of the Research

This study is the first investigation in this specific field, grounded in prior research and studies. This study offers two significant contributions to the current literature about the impact of

hospital ownership on healthcare quality. The majority of the literature originates from the United States and European nations, with less research conducted in India, particularly in Jharkhand. In the United States, private health insurance is prevalent and optional for people. In European nations, a limited percentage of elective procedures receive public funding. Our research encompasses individuals receiving treatment under the AB-PMJAY system, which seeks to achieve universal healthcare in India. This is the inaugural study that examines patients' impressions of the quality of treatment delivered by public and private facilities operating under the program.

This study is among the initial investigations that examine the quality of treatment from both the demand side—patient perspective—and the supply side—caregiver perspective. The existing studies either focus solely on the patients' opinions or exclusively on the medical staff's perspectives concerning the quality of care.

The study provides significant insights regarding the availability and accessibility of healthcare services. It evaluates the effects of government measures, including the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme, alongside the assessment of care quality, to improve healthcare accessibility and affordability in the state. Furthermore, the study elucidates effective tactics and identifies areas for enhancement in healthcare policy and execution. Moreover, it highlights a sustained positive trend in hospital bed availability from 2003 to 2020, indicating a more than three-fold growth, which signifies the state's considerable investment in healthcare infrastructure development.

The report analyzes the expected high growth rates in the next years, indicating Jharkhand's promising potential for attracting investments, creating employment opportunities, and enhancing the living standards of its inhabitants. Nonetheless, the study elucidates that to preserve this growth trajectory and attain holistic development, the state must continue to tackle socio-economic inequalities, enhance healthcare facilities, and implement effective policies that promote sustainable growth.

This study elucidates that Public-Private Partnerships (PPPs) can substantially diminish out-of-pocket expenses by enhancing the accessibility of healthcare services, especially in rural and distant regions, while concurrently improving the quality of care. The study highlights the necessity for more effective treatments and techniques to meet unmet family planning needs, especially in Jharkhand. The significant impact of PPPs in broadening access to family planning services, improving care quality, and increasing awareness of contraceptive alternatives is remarkable. The persistent trend of elevated health expenditure in Jharkhand relative to the national average underscores the state government's recognition of the importance of healthcare investment. To convert this investment into enhanced health outcomes, adopting PPPs may serve as a strategic measure, potentially resulting in a more

resilient, efficient, and equitable healthcare system that addresses the population's requirements.

The study's findings indicate a correlation between increased competition (total hospitals within a 5km radius) and elevated patient-perceived quality ratings, offering significant insights into the complex market dynamics of Jharkhand's healthcare sector. These results validate findings from other contexts, indicating that providers compete on non-price aspects like as quality in response to heightened competition. This competitive effect underscores the necessity of evaluating market dynamics beyond a mere public-private dichotomy when analyzing healthcare quality and formulating policies for its enhancement. The study's findings highlight the necessity for additional research to enhance comprehension of the intricate relationship among hospital ownership, market rivalry, and perceived quality of care in Jharkhand's healthcare environment. By examining these details, policymakers and healthcare stakeholders can formulate more precise and effective measures to improve the quality and accessibility of healthcare services in the state.

5.8 Limitations of the Study

Subsequent study expanding this approach to additional districts and states might provide a more thorough understanding. Future research may investigate variables such the working environment in public and private hospitals, patient volume, and the resources accessible inside these institutions. This may yield significant insights for formulating strategies to enhance the quality of healthcare service. Moreover, dependence on self-reported data raises the potential for response bias, necessitating careful interpretation. Integrating perceived quality metrics with clinical outcome data may yield a more comprehensive evaluation.

5.9 Scope for Future Research

This study's findings on quality disparities in healthcare delivery via public-private partnerships in Jharkhand present numerous intriguing opportunities for further research. Critical domains that necessitate more scrutiny encompass:

1. Extending the research to more districts and states in India to obtain a more thorough understanding of quality disparities between public and private healthcare institutions under the AB-PMJAY system. This would facilitate comparisons among various regions.
2. Examining possible disparities in views of healthcare quality across rural and urban populations, as well as across different socioeconomic groups. This may guide the formulation of more focused strategies to rectify disparities in access to quality care.

3. Investigating elements like as working environment, patient volume, and resource availability in public versus private hospitals to understand the determinants of quality disparities. This may inform measures to enhance public healthcare delivery.
4. Augmenting the study's dependence on perceived quality metrics with objective clinical outcome data to facilitate a more comprehensive evaluation of healthcare quality disparities.
5. Analyzing the intricate relationship among hospital ownership types, market competitiveness, and perceived quality of care to gain a deeper understanding of complexities beyond mere public-private disparities. This may guide initiatives to improve healthcare quality and accessibility.
6. Assessing the influence and efficacy of public-private partnership approaches in enhancing the quality, efficiency, and accessibility of healthcare services in underserved regions. Determining optimal techniques and key success elements.
7. Formulating and validating extensive quality assessment frameworks that integrate patient, provider, and health system viewpoints to provide continuous monitoring of care quality in both public and private facilities.
8. Implementing longitudinal studies to monitor variations in healthcare quality over time as AB-PMJAY and other efforts evolve, in order to evaluate policy impact.
9. Analyzing Jharkhand's experience alongside other states to extract applicable insights for the implementation of universal health coverage initiatives while ensuring quality preservation.
10. Investigating the impact of accreditation, regulation, and payment mechanisms on the quality of care in public and private hospitals to discern effective policy levers.

Exploring these research avenues can enhance the evidence foundation to inform policies and practices that elevate healthcare quality and equity as India advances towards universal health coverage. The findings obtained may hold significant importance for other developing nations enacting comparable healthcare reforms.

5.10 Concluding Statement

Our study highlights the pressing necessity for coordinated initiatives to improve both the perceived and actual quality standards in public healthcare facilities in Jharkhand. The results indicate substantial disparities in the quality of care between public and private hospitals in the state, with public institutions underperforming on essential metrics of patient satisfaction and trust. To rectify these gaps and provide fair access to superior healthcare for all individuals, policymakers and healthcare professionals in Jharkhand must emphasize quality enhancement measures. This necessitates the formulation of targeted policies and the allocation of sufficient

resources to enhance infrastructure, fortify the healthcare personnel, and execute evidence-based clinical procedures in public hospitals.

A viable option to address the quality disparity is to cultivate strategic alliances between the public health system and reputable private healthcare providers. Such alliances can utilize the experience, resources, and innovations of the private sector to improve the quality and efficiency of public healthcare delivery. These agreements must be meticulously designed and regulated to emphasize public health objectives while ensuring affordability and accessibility for all.

Enhancing the quality of public healthcare is essential for Jharkhand to advance towards attaining universal health coverage (UHC). Universal Health Coverage (UHC) seeks to guarantee that all persons can obtain necessary health treatments without incurring financial distress. Achieving this objective necessitates not only broadening coverage but also guaranteeing that the healthcare delivered is of adequate quality to enhance health outcomes. Consequently, quality enhancement initiatives in public hospitals are essential to Jharkhand's Universal Health Coverage goal.

Improving quality in public healthcare requires systemic improvements and a collaborative approach involving multiple stakeholders. This entails enhancing health information systems to effectively monitor quality indicators, instituting accountability procedures, and fostering a climate conducive to ongoing quality improvement. Policymakers must also tackle overarching health determinants, including socioeconomic disparities and societal factors that affect healthcare access and outcomes.

In conclusion, our study urges politicians, healthcare providers, and residents in Jharkhand to collaboratively pursue a public health system that delivers high-quality, equitable, and affordable treatment for everyone. By implementing strategic policy interventions, fostering public-private partnerships, and maintaining a resolute dedication to quality enhancement and systemic reforms, Jharkhand can achieve considerable progress in securing a healthy future for its populace. By prioritizing the improvement of both perceived and actual quality standards in public healthcare facilities, Jharkhand can serve as a model for other states in India and aid in the national objective of attaining universal health coverage while maintaining the quality of care provided to its citizens.

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APPENDICES

APPENDIX–A

CRITICAL PARAMETERS THAT ARE CONSIDERED IN THE STUDY

Research Title A Study on the Quality Differential in the Delivery of Healthcare Services through Public-Private Partnership Mode

S. No	Findings of Literature Survey	Critical Parameters
1	Public-private partnerships (PPPs) in healthcare have the potential to improve access to quality services, but their impact on quality remains debatable. Quality differentials can arise due to differences in infrastructure, equipment, human resources, clinical processes, and patient satisfaction. [Ebulue et al. (2024); Rao et al. (2018)]	- Infrastructure, equipment, and human resources - Clinical processes and outcomes - Patient satisfaction and experience
2	Unmet needs in family planning persist in many developing countries. PPPs can expand access to services, improve quality, and reach marginalized populations. However, challenges include ensuring sustainability, scalability, and equity. [Appleford & RamaRao (2019); Agarwal et al. (2019)]	- Equity and affordability - Sustainability and scalability of interventions
3	Quality of care is a multifaceted concept encompassing technical performance, interpersonal aspects, patient contributions, and health system impact. Measuring and improving quality is challenging due to subjectivity, lack of standardized tools, and social and cultural influences. [Prakash (2022); Donabedian (1988)]	- Social and cultural context -Patient-centeredness and holistic approach to quality
4	India's healthcare sector exhibits an extreme range of quality. Challenges include the growing burden of chronic diseases, lack of reliable data, and systemic issues. Evaluations reveal substandard average quality and regional disparities. [Rao et al. (2021); Angell et al. (2019)]	- Governance, regulation, and accountability - Data quality and availability
5	The private sector plays a significant role in India's healthcare but poses challenges in regulating quality, affordability, and accountability. Quality improvement strategies and PPPs have the potential to transform healthcare delivery. [Ondategui-Parra (2009); Sharma et al. (2021)]	- Public-private collaboration and partnership design - Quality improvement initiatives and strategies
6	The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) aims to provide financial protection and improved healthcare access to India's poor and vulnerable populations. Challenges include covering the 'missing middle', learning from other LMICs, and addressing quality	- Financial protection and healthcare access - Lessons from other LMICs - Quality of care under PM-JAY

	of care issues. [Aashima, & Sharma (2024); Garg et al. (2021)]	
7	Out-of-pocket (OOP) healthcare expenditure is a significant barrier to accessing quality healthcare in India. PM-JAY has shown promise in reducing OOP spending, but further efforts are needed to strengthen its implementation and tackle social determinants of health. [Nanda & Sharma (2023); Karan et al. (2022)]	- OOP healthcare expenditure - Social determinants of health
8	Recent studies highlight the need for greater attention to quality of care under PM-JAY. Issues include lack of adherence to guidelines, inadequate patient education, and poor coordination. A holistic, patient-centered approach to quality improvement is necessary. [Kanwal et al. (2024); Angell et al. (2023)]	- Adherence to clinical guidelines - Patient education and involvement - Care coordination and continuity
9	PPPs under PM-JAY have the potential to expand access, improve efficiency, and leverage private sector capacity. However, their effectiveness depends on partnership design, regulatory environment, and ensuring equity in access to care. [Nandi et al. (2020)]	- Partnership design and governance - Regulatory environment - Equity in access to care
10	Perceived quality of care plays a crucial role in shaping healthcare utilization decisions. Instruments like HEALTHQUAL and SERVQUAL provide insights into patient perceptions of healthcare service quality, with HEALTHQUAL being a more healthcare-specific adaptation. [Lee (2017); Nemati (2021)]	- Perceived quality of care - HEALTHQUAL and SERVQUAL instruments

APPENDIX–B

OBJECTIVES, HYPOTHESES, AND FINDINGS OF THE STUDY

Objectives	Data Type	Hypothesis	Tools Used	Outcome	Findings
To study the availability of basic and specialized healthcare services in Jharkhand.	Secondary				1.Significant shortfalls in healthcare facilities, particularly in rural and tribal areas, with a notable deficit in Community Health Centres (CHCs), indicating an overburdened system. 2. A positive trend in hospital bed availability from 2003 to 2020, reflecting the state's investment in healthcare infrastructure development, but emphasizing the need for continued efforts to ensure equitable distribution of healthcare resources and professionals across the state.
To study the trend of government expenditure on healthcare services in Jharkhand.	Secondary				1.Remarkable resilience and stability in economic growth from 2013-14 to the projected figures for 2023-24, showcasing the state's potential for future growth. 2. The successful implementation of the Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) has contributed to the state's

					progress by providing accessible healthcare to the underprivileged and improving the overall well-being of the population. 3. The projected high growth rates for the coming years indicate that Jharkhand is well-positioned to attract investments, create employment opportunities, and enhance the standard of living for its citizens, but sustaining this growth requires continued focus on addressing socio-economic disparities, strengthening healthcare infrastructure, and implementing effective policies for sustainable growth.
To assess the need of adoption of PPP mode in the healthcare sector in Jharkhand	Secondary				1.The regressive nature of high health expenditure, particularly for households in rural or semi-urban settings, highlighting the urgent need for increased public expenditure on healthcare and effective regulatory mechanisms to make quality healthcare affordable and accessible to all, especially the poorest and most vulnerable sections. 2. The disproportionate burden of out-of-pocket health expenditure on low-income individuals, accentuating

					income inequality and the medical poverty trap, emphasizing the necessity for more effective interventions and strategies to address the unmet needs in family planning, particularly in Jharkhand. 3. The potential role of Public-Private Partnerships (PPPs) in reducing out-of-pocket expenditure by expanding the reach of healthcare services, particularly in rural and remote areas, and enhancing the quality of care provided, contributing to building a more resilient, efficient, and equitable healthcare system. 4. The potential role of PPPs in expanding the reach of family planning services, improving care quality, and promoting awareness about contraceptive options is significant.
To establish benchmarks and develop framework for assessing and mapping quality differentials between public and private healthcare facilities in Jharkhand.	Primary	H_1: The quality of healthcare facilities/services provided by private entities is better than those provided by the public entities/healthcare. H_2: The proportion of patients who rank the quality	PCA, Multiple Linear Regression, Z Test of Proportions, Sentiment Analysis	Rejected Accepted	1. The statistically insignificant coefficient suggests that there is not enough evidence to support the claim that private hospitals are perceived to offer better healthcare services than public ones. 2. There is strong evidence to support the hypothesis that a higher

		of care as good in private hospitals is higher than the proportion of patients who rank the quality of care as good in public hospital. H2A: [Effectiveness] Doctors and nursing staff at private hospitals are perceived to be more competent than those working in public hospitals. H2B: [Safety] Procedures and systems put in place for preventing errors from happening are perceived to be better at private hospitals than at public hospitals. H2C: [Patient Centredness] Waiting time, post-admission, for a visit by the doctor is perceived to be lesser in private hospitals than in public hospitals.		Accepted Rejected Accepted	proportion of patients in private hospitals rate the services as good compared to those in public hospitals. 3. Based on the results of the Z test of proportions, the hypothesis that the proportion of patients in private hospitals who rate the safety aspect of quality of care as good is higher than the proportion of patients in public hospitals who do the same is not supported by the evidence, as indicated by the statistically insignificant difference in proportions. 4. Based on the results of the Z test of proportions, the hypothesis that the proportion of patients in private hospitals who rate the Patient Centredness aspect of quality of care as good is higher than the proportion of patients in public hospitals who do the same is supported by the evidence, as indicated by the statistically significant difference in proportions. 5. Based on the results of the Z test of proportions, the hypothesis that the proportion of patients in private hospitals who rate the Patient Centredness aspect of quality of care as good is higher than the proportion

		H2D: The mean sentiment score of private hospitals is greater than that of public hospitals. H3: The proportion of Medicare staff who rank the quality of care as good in private hospitals is higher than the proportion of Medicare staff who rank the quality of care as good in public hospital.		Accepted Accepted	of patients in public hospitals who do the same is supported by the evidence, as indicated by the statistically significant difference in proportions 6. Based on Sentiment analysis the mean sentiment score of private hospitals is greater than that of public hospitals. 7. Based on the results of the Z test of proportions, the hypothesis that the proportion of nursing staff in private hospitals who rank the quality of care as good is higher than the proportion of nursing staff in public hospitals who do the same is supported by the evidence, as indicated by the statistically significant difference in proportions.

APPENDIX–C

COMPARING THE FINDINGS OF THE THESIS WITH THE LITERATURE REVIEWED

S.N.	Highlightable Findings of the current study	Comparison of findings of your thesis with Literature reviewed	Commendable contribution of this research work towards the existing knowledge
1	This study represents the first of its kind in this particular area. This study makes a contribution to existing literature on the effect of hospital ownership on healthcare quality. Most of the literature is from the US and the European countries and very few done in India, especially Jharkhand. In US there is prominence of private health insurance which is voluntary for individuals. In European countries, only a small proportion of elective treatments are publicly funded. The study covers those treated under AB-PMJAY scheme aiming for universal healthcare in India. It is a first study which compares patients' perceptions of the quality of care provided by public and private facilities operating under the scheme.	Healthcare quality is a multi-dimensional concept. There is a consensus that quality can be measured, yet there is no widely available public toolkit for quality assessment (Brook et al.,2000); experts differ in the domains that the concept encompasses (Lawrence and Olsen, 1997; Donabedian, 1998; Çınaroğlu & Başer, 2016; Nemati et al., 2020). Studies investigating the quality of care in public and private healthcare settings in India, have mostly focused on specific aspects such as maternal care (Tripathi et al., 2019) or primary care services (Powell-Jackson et al.,2013; Pramanik, 2016; Rudrappa et al., 2018; Furtado et al., 2022). Moreover, there is a lack of comprehensive research examining patients' and medical staff's perceptions of the overall quality of healthcare delivery. Most existing studies either focus on patients' perspectives	1.The importance of considering both patient and provider perspectives in assessing healthcare quality, as demonstrated in the study, is supported by research emphasizing the multi-dimensional nature of quality and the need for comprehensive assessments but this is one of the first to investigate healthcare quality empirically from both the demand side (patient's perspective) and supply side (caregiver's perspective). 2. This study is one of the first to provide empirical evidence on healthcare quality differentials under the AB-PMJAY scheme in Jharkhand, India, addressing a critical gap in the literature on universal health coverage initiatives in resource-constrained settings 3. By examining the impact of AB-PMJAY on healthcare availability, accessibility, affordability, and quality in Jharkhand, the study provides a
2	This is one of the first studies which investigates the quality of care from the demand side–patient's perspective–and supply side–the caregiver's		

	perspective, both. The extant studies either examine only the patients' perspectives or only the medical staffs' perspectives regarding the quality of care.	(Bhat,1993; Narang, 2010; NBER working paper, July 2015) or medical staff's perspectives (Agarwal & Ganesh, 2017), but none have comprehensively evaluated both demand-side and supply-side perceptions. But more importantly, the existing literature lacks empirical investigations into the effect of hospital ownership on perceived quality of care. Perceived quality is formed by a mix of individual experience, processed information, encompassing aspects such as trust in providers, cultural beliefs, and social norms. It may not always align with clinical indicators or actual quality (Hanefeld et al.,2017). Perceived quality of care is the subjective evaluation of healthcare services by patients and is a significant driver of healthcare utilization (Rao et al., 2014).	comprehensive assessment that is rare in the existing literature, which often focuses on singular dimensions of health system performance. 4. The divergence between regression and Z-test results in the study highlights the limitations of linear model specifications in capturing the multi-dimensionality of healthcare quality perceptions, suggesting the need for further research using non-linear and quantile regression techniques. 5. The findings on the potential of public-private partnerships (PPPs) to improve healthcare access and quality in underserved areas of Jharkhand add to the limited evidence base on the effectiveness of PPPs in the Indian healthcare context. 6. The study's insights on the nuanced market dynamics beyond a simplistic public-private distinction, emphasizing the role of competition in driving quality improvements, contribute to the ongoing debate on the appropriate mix of public and private provision in achieving universal health coverage
3	The study offers valuable insights into the availability and accessibility of healthcare services. It also assesses the impact of government initiatives, such as the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) scheme, in conjunction with measuring the quality of care, to enhance healthcare access and affordability in the state. Moreover, the	The 'Ayushman Bharat–Pradhan Mantri Jan Aarogya Yojana' (AB–PMJAY) is the flagship program of the Government of India that aims towards achieving universal health coverage through empanelling hospitals across the country majority of which are private hospitals. Patients registered with the scheme can avail outpatient consultation and in-patient	

	study sheds light on successful strategies and areas for improvement in healthcare policy and implementation. Furthermore, it underscores a consistent positive trend in hospital bed availability from 2003 to 2020, demonstrating a more than three-fold increase, which reflects the state's substantial investment in healthcare infrastructure development.	treatment for a long list of specified conditions and diseases, and surgical procedures without having to pay any money to the service provider (Furtado et al., 2022).
4	The study examines the anticipated high growth rates in the upcoming years, signalling Jharkhand's favourable prospects for attracting investments, fostering employment opportunities, and elevating the standard of living for its residents. Nevertheless, the study explains that to maintain this growth momentum and achieve comprehensive development, the state must persist in addressing socio-economic disparities, bolstering healthcare infrastructure, and enacting impactful policies that foster sustainable growth.	Government ministries and departments should consider policies that promote healthy competition among healthcare providers, such as transparent quality reporting, performance-based incentives, and streamlined licensing processes. By fostering a competitive market environment, the government can encourage providers to improve quality and efficiency (Mackintosh et al., 2016; McPake & Hanson, 2016).
5	This study explains that Public-Private Partnerships (PPPs) have the potential to significantly reduce out-of-pocket expenditure by extending the accessibility of healthcare services, particularly in rural and remote areas, while also elevating the quality of care. The	Engaging with local communities and civil society organizations to ensure that PPPs are responsive to the needs and preferences of beneficiaries, and to promote awareness and trust in the scheme, can help foster a sense of ownership and accountability among

	study underscores the imperative for more effective interventions and strategies to address unmet family planning needs, particularly in Jharkhand.	all stakeholders (Raman & Björkman, 2009; Baliga et al., 2020).
6	The study's findings on the association between higher competition (total hospitals within a 5km radius) and higher perceived quality ratings by patients provide valuable insights into the nuanced market dynamics in Jharkhand's healthcare sector. This competition effect highlights the importance of considering market forces beyond a simplistic public-private distinction when assessing healthcare quality and developing policies to improve it.	The competition effect corroborates findings from other contexts where providers compete on non-price factors like quality and amenities (Kessler & McClellan, 2000; Tay, 2003).

APPENDIX–D

PATIENT QUESTIONNAIRE

Respondent No.:	**District:**	**Hospital Code:**
PMJAY:	**City/Village:**	**District:**
Gender:	**Ward/Mohalla:**	**City/Village:**
Age:		**Ward/Mohalla:**
Family Size:		**Out/In-Patient:**
Occupation:		**Surgical or Non-surgical:**
Education:		
Income Code:		

Statements	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
I have easy access to the medical specialists I need.					
When I go for medical care, they are careful to check everything when treating and examining me.					
Those who provide my medical care sometimes hurry too much when they treat me.					
Doctors are good about explaining the reason for medical tests.					
I'm informed well for prescription of given tablets.					
I find difficult to talk about things that concern me.					
I feel that I'm treated as person rather than a disease.					
I have to pay for more of my medical care than I can afford.					
My doctors are very competent and well-trained.					
Some of the doctors I have seen lack experience with my medical problems.					
The medical staff that treats me knows about the latest medical developments.					
Sometimes doctors make me wonder if their diagnosis is correct.					
Doctors never expose me to unnecessary risk.					
Nursing staff gave sufficient explanation on symptoms and treatment plans that were easy to comprehend.					

Nursing staff explain things in an understandable way regarding my query.	
Physician/Nurse explained possible medication side effects.	
Physician/Nurse explained what medication was for.	
Regular feedback from the patient about health status is taken.	
I find it easy to get an appointment for medical care right away.	
Staff was prompt in receiving and returning phone calls.	
The registration procedure for consultations was convenient.	
I am usually kept waiting for a long time when I am at the doctor's office.	
Hospital facilities were easy to locate (e.g. consultation room, diagnostic department, physical therapy room, and restroom).	
The office where I get medical care should be open for more hours than it is.	

APPENDIX–E

STAFF QUESTIONNAIRE

Hospital No.:	**Hospital Type:**	**Pharmacy:**	**Outpatient:**
Block:	**Specialities:**	**Pathology:**	**Referral:**
Sub-Division:	**No. of Doctors:**	**Radiology:**	**Timing:**
District:	**No. of Paramedics:**	**Surgery:**	**In-patient:**
		Type:	**No. of Beds**

Statements	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
We have enough staff to handle the workload					
We use more agency/temporary staff than is best for patient care					
We work in "crisis mode" trying to do too much, too quickly					
There is good cooperation among hospital units that need to work together					
Hospital units work well together to provide the best care for patients					
Problems often occur in the exchange of information across hospital units					
Important patient care information is often lost during shift changes					
Shift changes are problematic for patients in this hospital					
Our procedures and systems are good at preventing errors from happening					
Staff feel like their mistakes are held against them					
Hospital management provides a work climate that promotes patient safety					
Hospital management seems interested in patient safety only after an adverse event happens					
Patient safety is never sacrificed to get more work done					
We are actively doing things to improve patient safety					
After we make changes to improve patient safety, we evaluate their effectiveness					

APPENDIX–F

PUBLICATIONS & PRESENTATIONS BY THE SCHOLAR A. JOURNAL ARTICLES

#	Author(s)	Title	Journal	Impact Factor	ISSN	Pages/Vol/Issu	Month/Year	Indexing
1	Naboshree Bhattacharya Dr Satyendra Kishore	A Review of Quality Differential in Healthcare Delivery through PPP Model	International Journal of Science and Research		2319-7064	830-835/13/1	2024	Peer-Reviewed
2	Dr Sweta Sharan Naboshree Bhattacharya	A Comparative Study of Maternal and Child Health Status in Jharkhand and Bihar	IUJ Journal of Management	SJIF 7.458	2347-5080	270-290/11/2	2023	Peer-Reviewed
3	Dr Arohi Anand Naboshree Bhattacharya Animesh Karn	The Quality Divide: Patient and Staff Perceptions of Healthcare Quality in Private and Public Hospitals in India	British Journal of Health Care Management	1.1	1358-0574	[Forthcoming]	2025	Scopus

B. SEMINARS/CONFERENCES PRESENTATIONS

#	Author(s)	Title	Type	Month/ Year	Country	Conference/Seminar Topic	Level	Year
1	Naboshree Bhattacharya Dr Satyendra Kishore	A Review of Quality Differentials in Healthcare Delivery through PPP Model	Conference	2023	India	Academic Integration & Environmental Sustainability: An Interdisciplinary Manifesto	International	2023
2	Naboshree Bhattacharya Dr Satyendra Kishore	Metaverse In Healthcare: A Review	Conference	2024	India	Recent Developments in Commerce, Business, Management, Technology, & Social Innovation	International	2024

C. BOOKS/CHAPTERS/PROCEEDINGS

#	Book(s)/Chapter(s)	Title	Year	ISBN/ISSN	Indexing
1	Multi-Sector Analysis of the Digital Healthcare Industry	Artificial Intelligence and Metaverse Applications in the Healthcare Sector	2024	9798369317341	Scopus
2	Exploring the Metaverse	Metaverse in Healthcare: Potential Applications and Challenges	2025	9780443241321	Scopus