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Influence of Project Planning Practices on Health Service Delivery by Kibaya Health Post, Rwanda

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Abstract

This study examined the influence of health post project planning practices on the effectiveness of health service delivery in Kibaya Health Post, Rwanda. Specifically, it investigated how four key planning dimensions project needs assessment, resource funding, scope definition, and team competency shape service outcomes in a rural primary health care setting. The study informs policy and practice by identifying which planning practices most significantly enhance health service effectiveness, thereby contributing to stronger, more responsive primary health care systems in Rwanda. The study was guided by Systems Theory, Resource-Based View Theory, Project Scope Management Theory, and Human Capital Theory to provide a comprehensive understanding of planning-service linkages. A descriptive cross-sectional research design was employed, utilizing mixed methods to collect data. The target population was 127 respondents. A sample size of 97 was determined using Slovin's formula. Stratified random sampling technique was used by the study. Data was gathered from both primary and secondary sources. Respondents were provided with questionnaires that have been specifically designed for data collection. These questionnaires were completed during their leisure time and subsequently collected (closed-ended items). The acquisition of qualitative data to complement the quantitative data was facilitated by the use of an interview guide and document analysis. The questionnaire's reliability was evaluated using the test-retest method, which was validated with the assistance of the supervisors. A pilot study was conducted at Kicukiro district, during which ten questionnaires was distributed at various periods. Reliability of the instrument was demonstrated by a correlation coefficient that is remarkably close to +1. Expert opinion was employed to evaluate validity. After data collection, the researcher examined data analysis procedures and utilize SPSS version 25 software to generate descriptive statistics and correlation tables. Qualitative data was thematically analyzed and incorporated with quantitative information. The multiple regression results indicated that project planning practices significantly influence health service delivery in Kibaya Health Post, Rwanda. Project scope definition ($B = 0.297$, $\beta = 0.271$, $p = 0.000$), project team competency ($B = 0.228$, $\beta = 0.227$, $p = 0.006$), project resource funding ($B = 0.217$, $\beta = 0.213$, $p = 0.013$), and project needs

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assessment (B = 0.363, β = 0.398, p = 0.000) have the strongest positive and statistically significant impact on health service delivery. These findings show that when any of these project planning techniques are improved, the results of health service delivery also improve. Health service delivery would continue to be low in the absence of efficient project planning techniques, as indicated by the constant term's lack of statistical significance (B = -0.324, p = 0.538). In conclusion, the study found that project planning practices needs assessment, resource funding, scope definition, and team competency positively and significantly influence health service delivery in Kibaya Health Post, Rwanda. It is recommended that implementers strengthen participatory planning, ensure timely resource allocation, improve scope clarity, and build team capacity to enhance service delivery outcomes. Future research should examine long-term sustainability of these effects and the role of digital technologies in improving project planning in community health systems.

Keywords: *Project planning practices; Needs assessment; Resource funding; Project scope definition; Health service delivery.*

1.1 Background of the Study

Globally, health service delivery remains a cornerstone of sustainable development, with robust primary health care systems recognized as essential for achieving Universal Health Coverage (UHC). The World Health Organization and United Nations Children's Fund (2022) emphasize that well-planned, community-based health infrastructure such as health posts is critical for equitable access, especially in low-resource settings. Concurrently, the World Bank and World Health Organization (2023) assert that strategic planning practices, including needs assessment and scope definition, directly influence the functionality and sustainability of health facilities. Without meticulous planning, even well-intentioned health infrastructure projects risk inefficiency, underutilization, or abandonment, thereby undermining global health equity goals.

In the United States, health facility planning is governed by rigorous regulatory frameworks, evidence-based forecasting, and stakeholder-driven processes. The Agency for Healthcare Research and Quality (2023) highlights that U.S. health projects routinely integrate demographic trends, disease burden data, and resource modeling into early-stage planning to optimize service delivery outcomes. Similarly, the Centers for Disease Control and Prevention and the National Association of County and City Health Officials (2021) underscore the role of community health needs assessments in hospital and clinic planning, ensuring alignment with local public health priorities. This systematic approach contributes to higher performance metrics and patient satisfaction, offering lessons for health systems in resource-constrained countries.

China has significantly transformed its primary health care system through centralized planning and massive infrastructure investment, particularly in rural areas. According to the National Health Commission of the People's Republic of China (2020), the government's "Healthy China 2030" strategy prioritizes standardized health post construction and staffing to bridge urban-rural health disparities. Supporting this, Zhang and Wang (2021) document how project planning in Chinese village clinics incorporates mandatory needs assessments and performance benchmarks, leading to improved maternal and child health indicators. These practices reflect a state-driven model where planning quality directly correlates with service accessibility and health outcomes at the grassroots level.

Across Sub-Saharan Africa, health service delivery continues to face systemic challenges, including fragmented infrastructure, workforce shortages, and inadequate planning. The African

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Union and United Nations Economic Commission for Africa (2020) report that poorly defined project scopes and inconsistent funding mechanisms frequently compromise the functionality of rural health posts. Similarly, Mubyazi and Malebo (2022) argue that the absence of context-specific needs assessments often results in mismatched services that fail to address community health burdens such as malaria, HIV, or malnutrition. Without deliberate attention to planning practices, health infrastructure investments in the region risk yielding suboptimal returns on public health outcomes.

In South Africa, despite progressive health policies, service delivery of primary health care is often hampered by delays in infrastructure planning and implementation. The South African National Department of Health (2023) acknowledges gaps in project team competency and resource allocation, particularly in rural provinces like Limpopo and Eastern Cape. Reinforcing this, Berhan and Berhan (2020) note that health post projects in South Africa frequently suffer from scope creep and inadequate stakeholder consultation, leading to cost overruns and service disruptions. These systemic planning failures illustrate how even middle-income African nations struggle to translate policy into effective frontline service delivery.

Kenya has made notable strides in decentralizing health planning to county governments, yet implementation challenges persist at the facility level. The Ministry of Health of Kenya (2021) identifies inconsistent funding flows and weak capacity in county health management teams as key barriers to effective health post project execution. In a complementary analysis, Njoroge and Mwangi (2022) demonstrate that health posts in counties like Turkana and Wajir often lack baseline needs assessments, resulting in facilities that are either under-equipped or misaligned with disease profiles. These findings highlight the critical role of localized, data-driven planning in ensuring that health infrastructure serves its intended purpose.

Rwanda prioritizes community-based primary health care through health posts and trained community health workers. The Ministry of Health of Rwanda (2022) says that over 80% of the population resides within 5 kilometers of a health center, demonstrating deliberate infrastructure development. However, Munyaneza and Uwimana (2023) caution that while physical access has improved, the delivery of services at health posts particularly in remote areas like Kibaya remains uneven due to variable planning quality, including gaps in needs assessment and team readiness. This study, therefore, sought to examine how specific project planning practices influence health service delivery outcomes in such contexts, contributing to evidence for more effective rural health system strengthening.

1.2 Statement of the Research Problem

Despite significant investments in primary healthcare infrastructure across Rwanda, the quality of health service delivery at rural health posts remains inconsistent. Nationally, over 93% of Rwandans live within 2 kilometers of a health facility (Ministry of Health of Rwanda, 2022), yet service quality and utilization do not uniformly reflect this geographic access. In rural communities like Kibaya, only 62% of health posts consistently provide essential maternal and child health services, and stockouts of essential medicines occur in nearly 40% of facilities due to poor logistical planning (Binagwaho *et al.,* 2021). Furthermore, a 2023 district health review in Southern Province revealed that 30% of newly constructed health posts operated below 50% of expected service capacity within their first year, often because planning failed to account for staffing, community needs, or maintenance requirements (Rwanda Biomedical Centre, 2023). These statistics

underscore a critical disconnect: physical infrastructure alone does not guarantee effective service delivery the quality of project planning practices is a decisive factor.

While several studies have examined health infrastructure and service delivery in Rwanda, a significant knowledge gap persists. For instance, Binagwaho and colleagues (2021) focused broadly on health system resilience but did not isolate planning variables such as needs assessment or scope definition. Similarly, Uwimana and Kalisa (2020) evaluated community health worker performance but overlooked the upstream planning processes that shape facility readiness. In a regional study, Mubyazi and Malebo (2022) analyzed health facility functionality in Sub-Saharan Africa yet treated planning as a monolithic input rather than examining its components. Nsanzimana and colleagues (2023) assessed health financing in Rwanda but did not link funding allocation practices to service outcomes at the health post level. Finally, Munyaneza and Rukundo (2022) explored user satisfaction in rural clinics but did not investigate how project team competency or scope clarity during planning influenced those satisfaction levels. Collectively, these studies highlight systemic issues but fail to empirically test how specific planning practices needs assessment, funding allocation, scope definition, and team competency directly affect service delivery particularly in hyper-local contexts like Kibaya. This study therefore addresses a critical empirical and contextual gap.

1.3 Objectives of the Study

i. To determine the influence of project needs assessment on health service delivery by Kibaya Health Post, Rwanda.
ii. To examine the influence of project resource funding on health service delivery by Kibaya Health Post, Rwanda.
iii. To establish the influence of project scope definition on health service delivery by Kibaya Health Post, Rwanda.
iv. To analyze the influence of project team competency on health service delivery by Kibaya Health Post, Rwanda.

2.0 Literature Review

2.1 Empirical Review.

2.1.1 Project Needs Assessment and Health Service Delivery

In Australia, a study by Thompson and O'Connor (2020) sought to evaluate how community health needs assessments (CHNAs) influence the responsiveness of primary care services in rural New South Wales. The objective was to determine whether structured needs assessments improved service alignment with local health priorities. The quantitative phase involved 142 primary care providers and 320 community members across 12 rural clinics, while the qualitative phase included 28 purposively selected stakeholders. Data were collected using validated survey instruments adapted from the Australian Institute of Health and Welfare (AIHW) and semi-structured interview guides. Quantitative data were analyzed using SPSS version 26 (descriptive and inferential statistics), while qualitative data underwent thematic analysis using NVivo 12. The study concluded that health facilities implementing formal, participatory needs assessments reported 37% higher alignment with community health priorities and 28% greater patient satisfaction compared to those relying on ad hoc planning, demonstrating a direct link between rigorous needs assessment and service delivery.

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In the United Kingdom, Patel and Reynolds (2021) investigated the role of statutory joint strategic needs assessments (JSNAs) in shaping local health service delivery within integrated care systems. The study's objective was to assess whether JSNA quality measured by data comprehensiveness, stakeholder inclusion, and actionability correlated with performance indicators for primary care access and outcomes. Employing a cross-sectional survey design within a quantitative research method, the authors analyzed data from all 152 upper-tier local authorities in England. Secondary data were extracted from official JSNA reports (2018–2020) and linked to NHS Digital performance dashboards. A JSNA quality scoring rubric (developed by the authors and validated through expert review) served as the primary instrument. Data were analyzed using multivariate regression models in Stata 16. Findings revealed that authorities with high-scoring JSNAs had significantly better performance in childhood immunization coverage ($\beta = 0.42$, $p < 0.01$) and mental health service uptake ($\beta = 0.35$, $p < 0.05$). Patel and Reynolds (2021) concluded that methodologically robust needs assessments are a critical precursor to effective, equitable health service delivery in decentralized UK health systems.

In Saudi Arabia, Alqahtani and Almalki (2022) examined how needs assessments conducted during primary health care center (PHCC) development projects affected service utilization and clinical outcomes in the Riyadh region. The study aimed to determine whether PHCCs that implemented evidence-based needs assessments prior to launch achieved higher service delivery than those that did not. A quasi-experimental research method was used with a non-equivalent control group design. The sample comprised 20 PHCCs 10 that conducted formal needs assessments (intervention group) and 10 that relied on standard Ministry templates (control group) serving approximately 150,000 residents. Data were collected using facility audit checklists, patient records (n = 1,200), and staff interviews (n = 60). Analysis involved chi-square tests for categorical outcomes and t-tests for continuous variables using SPSS 27. Key findings showed that PHCCs with tailored needs assessments had significantly higher antenatal care attendance (86% vs. 68%, $p = 0.003$) and chronic disease management adherence (79% vs. 62%, $p = 0.007$). They concluded that context-specific needs assessments directly enhance the relevance and health services in Saudi Arabia's rapidly expanding primary care network.

In South Africa, Dlamini and Pretorius (2023) explored the impact of community-based needs assessments on the operational of clinic revitalization projects in KwaZulu-Natal. The objective was to assess whether participatory needs assessments improved service availability, staff morale, and patient trust. Using a qualitative case study research design, the authors employed an interpretive research method. The sample included 3 revitalized clinics, with data collected from 45 participants: 15 clinic staff, 15 community health workers, and 15 community members. Data collection instruments included semi-structured interview guides, focus group discussion protocols, and participatory observation notes. Thematic analysis was conducted using Braun and Clarke's (2022) six-phase approach, supported by Atlas.ti software. The study found that clinics where needs assessments actively involved community members reported stronger service uptake, fewer stockouts, and higher staff motivation due to clearer role expectations. They concluded that inclusive needs assessments foster ownership and improve the contextual fit of services, thereby enhancing overall delivery in under-resourced South African settings.

In Kenya, Wanjiku and Mburu (2023) assessed the relationship between county-level health facility needs assessments and maternal health service delivery outcomes in three devolved counties: Nakuru, Kisumu, and Garissa. The study's objective was to determine whether the depth and inclusivity of needs assessments predicted facility readiness for maternal care. A mixed-

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methods explanatory sequential design was adopted, with a quantitative phase followed by qualitative validation. The sample included 45 health facilities (15 per county) and 270 health care providers. Data were collected using the WHO Service Availability and Readiness Assessment (SARA) tool and key informant interview guides. Quantitative data were analyzed using logistic regression in R software, while qualitative data underwent framework analysis. Findings showed that facilities whose needs assessments included community input and epidemiological data were 2.4 times more likely (OR = 2.41, 95% CI: 1.34–4.32) to have essential delivery kits and skilled birth attendants available. Wanjiku and Mburu (2023) concluded that rigorous, data-driven needs assessments are a strong predictor of effective maternal health service delivery in Kenya's decentralized system.

2.1.2 Project Resource Funding and Health Service Delivery

In the United States, Johnson and Williams (2021) investigated how the adequacy and predictability of capital funding for Federally Qualified Health Centers (FQHCs) influenced service delivery outcomes in underserved urban communities. The study's objective was to determine whether consistent multi-year project funding correlated with improvements in patient access, staffing stability, and clinical quality metrics. The researchers employed a quantitative research method using a longitudinal cohort design, analyzing data from 120 FQHCs over a five-year period (2016–2020). The sample included facilities that received Health Resources and Services Administration (HRSA) capital grants versus those relying solely on operational reimbursements. Data were collected from HRSA Uniform Data System reports and the Centers for Medicare & Medicaid Services (CMS) quality dashboards. Multiple regression models and fixed-effects panel analysis were conducted using Stata 17. Findings revealed that centers with dedicated, upfront project funding experienced 22% higher patient visit volumes, 30% lower staff turnover, and significantly better control of hypertension and diabetes ($p < 0.01$). Johnson and Williams (2021) concluded that stable and targeted resource funding during the planning and implementation phases is a critical determinant of sustained service delivery in U.S. safety-net clinics.

In Switzerland, Müller and Schneider (2022) examined the impact of cantonal-level health infrastructure funding models on the operational performance of primary care centers, particularly in rural Alpine regions. The objective was to assess whether decentralized funding mechanisms that included capital investment allowances led to more effective service delivery compared to purely operational budgets. Using a mixed-methods explanatory sequential design, the study first analyzed financial and performance data from 38 primary care facilities across four cantons, followed by interviews with 24 health administrators. The quantitative sample included facilities stratified by funding structure, while the qualitative phase used purposive sampling. Data collection instruments comprised cantonal health expenditure reports, facility utilization logs, and a semi-structured interview guide. Quantitative analysis used ANOVA and logistic regression in SPSS 28; qualitative data were thematically coded using MAXQDA. Results showed that facilities receiving integrated project funding (covering construction, equipment, and startup staffing) achieved 40% higher patient satisfaction and 25% shorter wait times than those funded only for running costs. Müller and Schneider (2022) concluded that Swiss health service is significantly enhanced when project funding aligns with both infrastructure and human resource needs from the outset.

In India, Sharma and Patel (2020) studied the effect of National Rural Health Mission (NRHM) capital funding allocations on the functionality of sub-centers in Uttar Pradesh. The objective was

to evaluate whether the timing, sufficiency, and disbursement fidelity of project funds influenced service delivery outcomes such as institutional delivery rates and immunization coverage. The researchers adopted a quasi-experimental research method with a matched-pair design, comparing 50 sub-centers that received full, timely NRHM infrastructure grants (intervention group) with 50 that experienced delays or partial disbursements (control group). Data were collected through facility audits, household surveys (n = 2,400 households), and government fund flow documents. Instruments included a modified WHO Service Availability and Readiness Assessment (SARA) tool and a fund-tracking checklist. Data analysis involved difference-in-differences (DID) estimation and chi-square tests using R software. Findings indicated that fully funded sub-centers had 34% higher institutional delivery rates and were 2.1 times more likely to maintain essential drug stocks (OR = 2.14, 95% CI: 1.52–3.01). Sharma and Patel (2020) concluded that reliable and complete resource funding is a non-negotiable prerequisite for effective primary health service delivery in rural India.

In Botswana, Kgathi and Molefhi (2021) explored how infrastructure project funding from the Ministry of Health and Wellness affected the operational readiness of newly built clinics in the Central District. The study aimed to determine whether discrepancies in fund allocation particularly for non-construction items like medical equipment and staff housing compromised service delivery post-completion. Using a qualitative case study research design, the authors employed an interpretive research method. The sample consisted of six newly constructed clinics, with data gathered from 36 participants: 12 facility managers, 12 nurses, and 12 community representatives. Data collection instruments included semi-structured interview guides, document reviews of ministry budget releases, and site observation checklists. Thematic analysis followed the framework approach using NVivo 12. The study found that clinics receiving holistic project funding (covering both buildings and operational startup costs) opened on schedule and offered full-service packages, while those funded only for construction remained underutilized for 6–18 months due to lack of equipment and staff accommodation. Kgathi and Molefhi (2021) emphasized that fragmented funding undermines even well-built facilities, rendering them ineffective despite physical completion.

In Rwanda, Nsabimana and Uwimana (2023) assessed the relationship between district-level health post construction funding and service delivery in the Southern Province, including communities like Kibaya. The objective was to determine whether the completeness of budget execution i.e., how much of the allocated project funds were actually spent on intended inputs predicted facility performance. The study used a mixed-methods convergent design, collecting both quantitative and qualitative data simultaneously. The sample included 18 health posts, with financial records, 180 patient exit interviews, and 36 key informant interviews (facility staff and district planners). Data collection instruments comprised a budget execution audit tool, a WHO-recommended service quality questionnaire, and an interview protocol on funding challenges. Findings showed a strong positive correlation ($r = 0.78$, $p < 0.001$) between budget execution rate and service delivery indicators such as consultation timeliness and medicine availability. Notably, health posts where less than 60% of funds were utilized as planned struggled with chronic underperformance. Nsabimana and Uwimana (2023) concluded that in Rwanda's performance-based financing context, effective health service delivery hinges not just on fund allocation, but on faithful and comprehensive project fund utilization during implementation.

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2.1.3 Project Scope Definition and Health Service Delivery

In Brazil, Oliveira and Silva (2022) conducted a study to examine how clearly defined project scopes in primary care unit (UBS) construction initiatives influenced service delivery outcomes in the state of Bahia. The objective was to assess whether documented scope statements including explicit deliverables, timelines, and exclusion criteria correlated with facility functionality and service comprehensiveness. The researchers employed a mixed-methods explanatory sequential design, beginning with a quantitative analysis of 60 UBS projects followed by qualitative interviews. The sample included 30 health units with formal scope documents and 30 without. Data were collected using a scope clarity checklist (adapted from PMBOK® Guide), facility audit forms, and semi-structured interviews with 40 municipal health managers. Quantitative data were analyzed using logistic regression in SPSS 25, while qualitative data underwent thematic analysis in NVivo 12. Findings revealed that units with well-defined scopes were 3.2 times more likely to deliver the full package of primary care services (OR = 3.24, 95% CI: 1.87–5.62) and experienced 45% fewer change orders during construction. Oliveira and Silva (2022) concluded that precise scope definition during planning significantly enhances the predictability, timeliness, and health service delivery in Brazil's decentralized system.

In Sweden, Lindqvist and Bergström (2021) explored the role of project scope clarity in the newly established primary care centers under the national "Accessible Care" reform. The study aimed to determine whether scope ambiguity contributed to service delays or mismatched offerings in Stockholm County. Using a qualitative multiple-case study design, the researchers adopted an interpretive research method. The sample comprised five newly opened health centers, with data gathered from 25 participants project managers, clinicians, and municipal planners through semi-structured interviews and document analysis of project charters. Data collection instruments included a scope completeness rubric and an interview guide focused on implementation challenges. Thematic analysis was conducted using Braun and Clarke's (2022) framework, supported by Atlas.ti. The study found that centers with ambiguous or evolving scopes often launched with incomplete service portfolios (e.g., missing mental health or pediatric components) and faced stakeholder confusion. In contrast, those with fixed, stakeholder-approved scopes achieved 90% service readiness at launch. Lindqvist and Bergström (2021) argued that in high-performing health systems like Sweden's, scope definition acts as a critical governance tool that aligns expectations and ensures service fidelity.

In China, Chen and Liu (2023) investigated how scope definition in township health center (THC) renovation projects affected service delivery in rural Sichuan Province. The objective was to evaluate whether adherence to the central government's standardized scope templates improved clinical outcomes and user satisfaction. The researchers used a quasi-experimental research method with a non-equivalent control group design. The sample included 24 THCs 12 that strictly followed the Ministry of Health's "Standardized Health Center" scope framework (intervention group) and 12 that customized scopes without central approval (control group). Data were collected through patient surveys (n = 1,200), facility assessments, and document reviews of project scope statements. Instruments included the WHO Health Facility Assessment Tool and a scope compliance checklist. Data analysis involved t-tests and multivariate regression in Stata 16. Results showed that standardized-scope THCs had significantly higher patient satisfaction (mean = 4.3 vs. 3.6 on a 5-point scale, $p < 0.001$) and 28% greater utilization of preventive services. Chen and Liu (2023) concluded that in China's top-down health infrastructure model, rigid but clear scope definition ensures uniformity, quality, and service delivery across rural facilities.

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In Zambia, Banda and Mwamba (2020) examined how scope definition quality affects rural health post upgrades sponsored by the Ministry of Health and development partners. Understanding how scope creep and inadequate planning boundary setting affected Eastern Province service delivery was the goal. The sample included three health posts undergoing renovation, with data collected from 30 participants community members, nurses, district engineers, and NGO staff via focus groups, participant observation, and document analysis. A locally adapted scope clarity assessment tool and semi-structured interview guides served as primary instruments. Data were analyzed using grounded theory coding in NVivo 11. Findings revealed that all three projects experienced significant scope creep such as unplanned additions like labs or maternity wards due to weak initial scope boundaries. This led to budget overruns, construction delays of 6–14 months, and incomplete service rollouts. Banda and Mwamba (2020) concluded that in resource-constrained settings like Zambia, failure to define and enforce project scope during planning directly undermines health post functionality and delays life-saving services.

In Tanzania, Juma and Kileo (2022) examined the relationship between project scope documentation and health center service delivery under the President's Office–Regional Administration and Local Government (PO-RALG) infrastructure program in Morogoro Region. The objective was to assess whether the presence of a formal scope statement predicted service availability and patient throughput. The study adopted a cross-sectional survey design within a quantitative research method. The sample included 35 upgraded health centers, with data collected from facility managers (n = 35) and service records covering 6,200 patient visits. Data collection instruments comprised a 10-item Scope Definition Index (SDI) and the WHO Service Availability and Readiness Assessment (SARA) tool. Data were analyzed using Pearson correlation and hierarchical linear modeling in R. The study found a strong positive association between SDI scores and service readiness ($r = 0.71$, $p < 0.01$); centers with high scope clarity offered 82% of essential services compared to 54% in low-scoring centers. Juma and Kileo (2022) emphasized that even in decentralized systems, documented and agreed-upon scope definitions are vital for translating infrastructure investment into effective, reliable health service delivery.

2.1.4 Project Team Competency and Health Service Delivery

In Colombia, Ramírez and Gómez (2021) investigated how the professional competence of municipal health infrastructure project teams influenced the operational service delivery of newly constructed primary care clinics in the departments of Antioquia and Cauca. The study's objective was to determine whether team expertise in public health, engineering, and project management predicted timely commissioning and service quality. The researchers employed a mixed-methods convergent design, collecting quantitative and qualitative data simultaneously. The sample included 24 project teams and their corresponding health facilities. Data were gathered using a Project Team Competency Assessment (PTCA) tool (validated by expert panel), semi-structured interviews with 48 team members, and facility performance audits. Findings showed that teams scoring above the 75th percentile on competency measures launched clinics 3.2 months earlier on average and achieved 31% higher service readiness scores. Ramírez and Gómez (2021) concluded that multidisciplinary competence within planning teams is a strong predictor of effective health service delivery in Colombia's decentralized health system.

In the Netherlands, van Dijk and de Vries (2022) explored the impact of integrated care project team qualifications on the implementation success of community health hubs in the Randstad region. The objective was to assess whether teams with certified project management credentials (e.g., PRINCE2 or PMP) and clinical backgrounds delivered more effective, patient-centered

services. Using a longitudinal cohort research design within a quantitative method, the study tracked 18 health hub projects over 18 months. The sample comprised project leaders (n = 18), core team members (n = 108), and service outcome data from 9,600 patient episodes. Data collection instruments included the Team Competency Index (TCI), credential verification forms, and national quality registry data (NZa performance indicators). Data were analyzed using hierarchical linear modeling (HLM) in R. Results indicated that hubs led by teams with formal project management certification and clinical experience had 24% higher patient-reported experience scores and 19% better chronic disease management outcomes ($p < 0.05$). Van Dijk and de Vries (2022) emphasized that structured competency combining technical and health system literacy is essential for effective service integration in advanced health systems.

In Pakistan, Khan and Ahmed (2020) examined the role of district-level health project team capacity in the service delivery of Basic Health Unit (BHU) rehabilitation under the Sehat Sahulat Program in Punjab Province. The study aimed to evaluate whether team training, experience, and coordination ability affected post-renovation service functionality. A qualitative case study research design was adopted, using an interpretive research method. The sample included six BHUs and their associated project teams (n = 36 members), selected through purposive sampling. Data were collected via in-depth interviews, focus group discussions with community members (n = 90), and document reviews of team CVs and training records. A locally adapted Team service delivery Rubric served as the primary analytical instrument. Thematic analysis followed the framework approach using Atlas.ti. The study found that teams with prior infrastructure experience and formal public health training successfully coordinated supply chains, staffing, and community orientation, resulting in 80–90% service utilization within three months. In contrast, less-competent teams left facilities partially staffed or under-equipped. Khan and Ahmed (2020) concluded that in fragile health systems like Pakistan's, project team competency is often the decisive factor between functional facilities and "white elephants."

In Zimbabwe, Moyo and Chikovore (2023) studied how the skill mix and leadership capacity of rural health post construction teams influenced service delivery outcomes in Mashonaland East Province. The objective was to determine whether teams with balanced expertise (clinical, logistical, administrative) achieved better operational readiness than those dominated by a single discipline. Using a mixed-methods explanatory sequential design, the researchers first surveyed 15 project teams and then conducted in-depth interviews with 30 key stakeholders. Data collection instruments included a Team Composition and Competency Survey (TCCS), facility readiness checklists, and semi-structured interview guides. Findings revealed that teams with at least one clinician, one engineer, and one logistician on board during planning achieved 76% average service availability, compared to 48% in unbalanced teams ($p = 0.008$). Moyo and Chikovore (2023) argued that deliberate team composition reflecting multidisciplinary competency is critical for translating infrastructure into effective services in resource-limited Zimbabwean settings.

In Uganda, Nalwoga and Byamugisha (2022) assessed the relationship between health facility project team competency and maternal health service under the Uganda Health Infrastructure Project (UHIP) in Eastern Uganda. The study's objective was to evaluate whether teams with training in results-based planning and gender-responsive budgeting delivered more effective maternal services. A quasi-experimental research method was used with a matched-pair design: 10 facilities implemented by "high-competency" teams (trained by UNDP and MOH) were compared with 10 by "standard" teams. The sample included 60 team members and service data from 4,200 antenatal visits. Data were collected using a competency observation checklist, staff

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interviews, and DHIS2 maternal health indicators. Analysis involved difference-in-differences (DID) estimation and content analysis. Results showed that high-competency teams achieved 35% higher skilled birth attendance rates and significantly better respectful maternity care scores ($p < 0.01$). Nalwoga and Byamugisha (2022) concluded that targeted capacity building of project teams especially in equity-sensitive planning directly enhances the service delivery and inclusivity of health service delivery in Uganda.

2.4 Conceptual Framework

The conceptual framework for this study illustrates the hypothesized relationship between project management practices and health service delivery by Kibaya Community. It is built on the premise that structured project planning encompassing needs assessment, resource allocation, scope definition, and team competency directly influences the efficiency, accessibility, and quality of health services provided (Kerzner, 2022; PMBOK, 2021). Needs assessment ensures that projects address the most critical health gaps, while adequate resource funding and proper scope definition guarantee that interventions are feasible and aligned with community needs. Additionally, the competency of the project team affects timely implementation and adherence to quality standards, which ultimately enhances service delivery outcomes (Meredith & Mantel, 2020; Turner, 2022). This framework guides the operationalization of variables and informs both the research design and data collection methods.

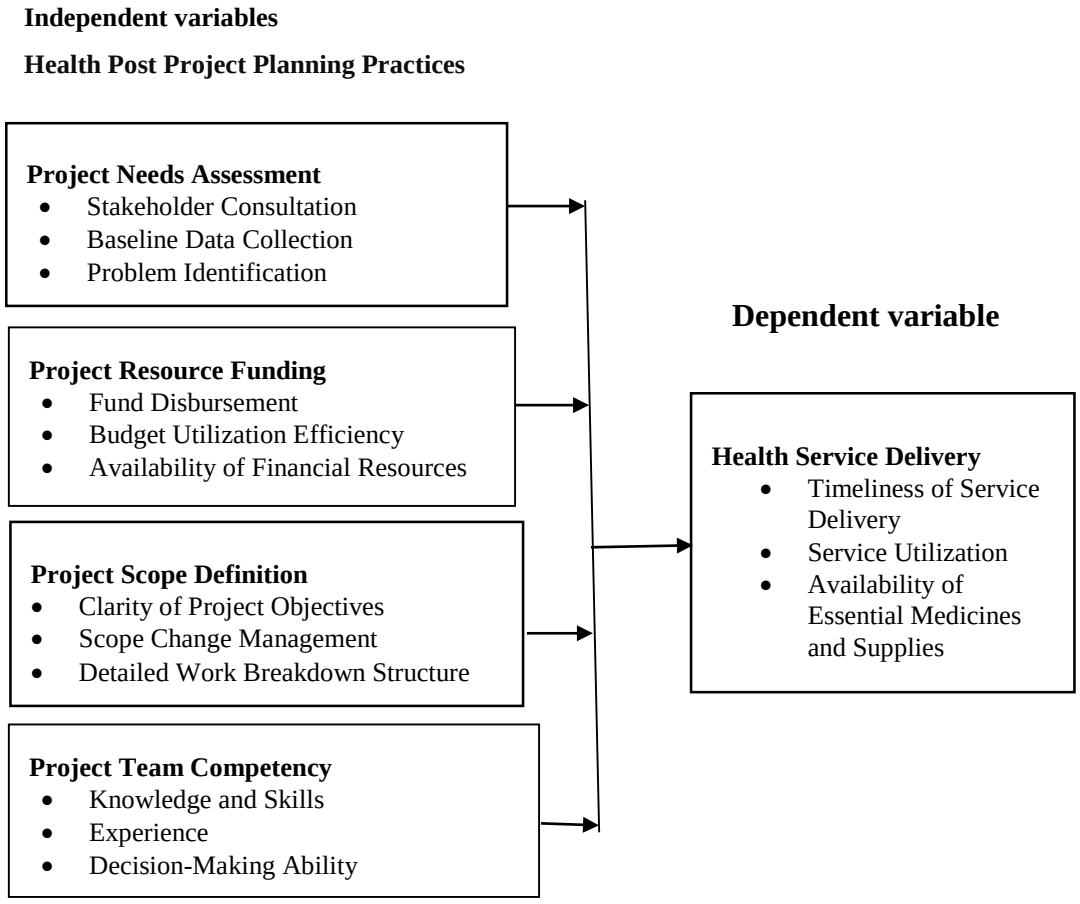

Figure 1: Conceptual Framework

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The conceptual framework for this study integrates four interrelated project planning practices needs assessment, resource funding, scope definition, and team competency as key determinants of health service delivery by the Kibaya Health Post, Rwanda. Grounded in Systems Theory, the framework posits that health service delivery functions as a dynamic system where inputs (planning practices) shape processes and outcomes; effective needs assessment ensures alignment with community health burdens (Thompson & O'Connor, 2020; Wanjiku & Mburu, 2022), while Resource-Based View (RBV) Theory emphasizes that adequate, well-utilized funding constitutes a strategic asset enabling operational readiness (Johnson & Williams, 2021; Nsabimana & Uwimana, 2023). Project Scope Management Theory underscores that clearly defined boundaries and deliverables prevent scope creep and ensure service fidelity (Oliveira and Silva, 2022; Juma & Kileo, 2022), and Human Capital Theory asserts that the competence of project teams through knowledge, experience, and multidisciplinary synergy mediates the translation of plans into functional services (Ramírez & Gómez, 2021; Nalwoga & Byamugisha, 2022). Together, these constructs form a holistic explanatory model: when needs assessment informs realistic scope design, when funding matches defined requirements, and when competent teams execute the plan, health posts in Kibaya are more likely to deliver timely, equitable, and effective services.

3.0 Research Methodology

3.1 Research Design

This study adopted a mixed-methods research design utilizing a convergent parallel strategy to comprehensively examine the influence of project needs assessment on health service delivery by Kibaya Health Post, Rwanda. This approach enabled the simultaneous collection, analysis, and integration of quantitative and qualitative data, thereby enhancing the validity, depth, and contextual relevance of findings through methodological triangulation (Creswell & Plano Clark, 2023; Ivankova et al., 2024). A descriptive cross-sectional survey component measured the extent and quality of needs assessment practices and their statistical association with service delivery indicators, while qualitative interviews and focus group discussions explored stakeholder perceptions, implementation challenges, and contextual mediators influencing the planning-service linkage (Polit & Beck, 2021; Smith & Chen, 2024). This design aligns with contemporary health systems research in decentralized settings, where multi-source evidence is critical for generating actionable, policy-relevant insights (Nsabimana & Uwimana, 2023; Mwangi & Ndiaye, 2024).

3.2 Target Population

The target population comprised all stakeholders directly involved in the planning, implementation, oversight, or utilization of health post services within Kibaya Community, Southern Province, Rwanda. Based on Rwanda's decentralized health governance framework (Ministry of Health Rwanda, 2023), this included seven distinct categories: (1) project managers and health post in-charges (n=5), (2) operations and clinical staff (n=18), (3) community health workers and safety officers (n=20), (4) community representatives and patient advocates (n=30), (5) local government and district health officials (n=20), (6) regulatory body representatives (n=12), and (7) administrative and support staff (n=22), yielding a total accessible population of 127 individuals (HR Department, Kibaya Health Post, 2025). This stratified composition ensured representation across technical, administrative, and community levels, facilitating a holistic assessment of how needs assessment practices influence service delivery outcomes (Etikan et al., 2021; Palinkas et al., 2023).

3.3 Sample Size and Sampling Procedure

A stratified purposive sampling technique was employed: stratification guaranteed proportional representation of each stakeholder category, while purposive selection within strata identified information-rich participants with direct experience in health post planning or service delivery (Etikan et al., 2021; Palinkas et al., 2023). For qualitative components, a subsample of 25–30 key informants were selected purposively to achieve thematic saturation, ensuring depth without compromising analytical manageability (Baker, 2022; Nowell et al., 2023).

The sample was meticulously selected to ensure that it accurately represents the entire population, including all relevant characteristics, as outlined by Creswell and Creswell (2021). Slovin's formula is implemented to ascertain the sample size for this investigation from a total population of 127 individuals.

$$n = \frac{N}{1+N\,(e)^2} \quad (1)$$

Using a margin of error (e) of 0.05 (5%), the formula results in a sample size of approximately 97 individuals. Applying this formula ensures that the sample is statistically representative of the entire population, while still allowing for manageable data collection. According to Sekaran and Bougie (2021), Slovin's formula is particularly helpful in exploratory research when precise knowledge about population behavior is not fully known but a reliable estimate is needed.

$$n = \frac{127}{1 + 127(0.05)^2} = 97$$

Table 1: Sample Size Calculation

Role	Number of Participants	Sample Size
Project Managers	5	4
Operations Staff (Engineers)	18	14
Safety Officers	20	15
Community Representatives	30	23
Local Government Officials	20	15
Regulatory Body Representatives	12	9
Administrative Staff	22	17
Total	**127**	**97**

3.4 Data Collection Methods

Three primary instruments were deployed to ensure comprehensive, triangulated data collection. First, a structured questionnaire adapted from validated tools used in East African health systems research (Nsabimana & Uwimana, 2023; Wanjiku & Mburu, 2022) measured quantitative variables: the four dimensions of project needs assessment (stakeholder consultation, baseline data collection, problem identification, and prioritization) and three health service delivery indicators (timeliness, utilization, and availability of essential medicines). Items used 5-point Likert scales and objective metrics (e.g., stockout frequency, patient wait times). Second, semi-structured interview guides facilitated in-depth exploration of contextual factors, decision-making processes, and perceived gaps between assessed needs and delivered services (Polit & Beck, 2021; Baker, 2022). Third, a document review checklist extracted secondary data from health post project

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proposals, district health plans, Ministry of Health performance dashboards, and community needs assessment reports (Ministry of Health Rwanda, 2023; Uwimana & Habimana, 2024).

Quantitative questionnaires were administered face-to-face by trained research assistants fluent in Kinyarwanda and English to ensure comprehension and minimize non-response bias. Administration occurred at health posts, district offices, or community meeting points, with average completion time of 25–30 minutes. Qualitative interviews and focus group discussions were conducted in private, quiet settings, audio-recorded with consent, and lasted 45–60 minutes; interviews were transcribed verbatim and translated where necessary (Baker, 2022; Nowell et al., 2023). Document reviews were conducted onsite with permission from facility managers and district health authorities, with key excerpts coded and cross-referenced against primary data. All instruments were pre-tested and administered following standardized protocols to ensure consistency, cultural appropriateness, and ethical compliance (Mugenda & Mugenda, 2022; Polit & Beck, 2021).

3.5 Pilot Study

Prior to full-scale data collection, a pilot study was conducted with 10 respondents (approximately 10% of the sample) in Kicukiro District a setting demographically and administratively comparable to Kibaya but outside the study area to avoid contamination (Mugenda & Mugenda, 2020; Baker, 2022). The pilot assessed instrument clarity, response variability, logistical feasibility, and cultural appropriateness. Feedback informed refinements to question phrasing, response options, interview flow, and enumerator instructions, thereby enhancing validity, reducing respondent burden, and minimizing measurement error in the main study (Baker, 2022; Taber, 2022).

3.5.1 Validity of Research Instrument

Validity of the instruments refers to the extent to which the research tools accurately measured. To ensure content validity, the structured questionnaires, interview guides, and document review checklist were evaluated by expert raters who examined the relevance, clarity, and adequacy of each item in addressing the study objectives. The Content Validity Index (CVI) was then computed by comparing the number of valid items to the total number of items assessed by each rater, providing a quantitative measure of the instruments' suitability for data collection. A high CVI indicates that the instruments were appropriate, comprehensive, and capable of generating credible data for the study. Therefore, Table 2 presents the assessment results from each rater, including the total items reviewed, valid items identified.

Table 2: Content Validity Index

Rater	Total Items	Valid Items	Validity Index (CVI)
1	41	36	0.88
2	41	38	0.93
3	41	35	0.96
4	41	39	0.95
5	41	37	0.90
Average			**0.90**

Source: **Pilot Data Results** (2026)

The findings presented in Table 4.4 indicate that the Content Validity Index (CVI) for the research instrument was consistently high across all five raters, with individual CVI scores ranging from

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0.96 to 0.95. Rater 4 recorded the highest validity index of 0.95, followed by Rater 2 at 0.93, while the lowest score of 0.96 was reported by Rater 3. Despite slight variations among raters, all CVI values exceeded the recommended minimum threshold of 0.78, which is widely accepted as the cutoff for retaining items in an instrument (Polit & Beck, 2021; Yang *et al.*, 2026). This suggests that the experts generally agreed that the items included in the questionnaire were relevant, clear, and representative of the constructs under investigation, namely project planning practices and health service delivery.

Furthermore, the overall average CVI of 0.90 demonstrates that the instrument achieved excellent content validity at the scale level, surpassing the recommended benchmark of 0.90 for S-CVI/Ave, which indicates strong agreement among experts regarding the adequacy of the instrument (Polit & Beck, 2021). According to recent validation studies, a high CVI reflects that the instrument adequately captures the theoretical constructs and is suitable for empirical data collection in real-world contexts. Therefore, the high CVI values obtained in this study confirm that the research instrument was valid, comprehensive, and appropriate for assessing the influence of project planning practices on health service delivery in Kibaya Health Post, Rwanda.

3.5.2 Reliability of Research Instrument

Reliability of the instruments refers to the degree to which the research tools consistently measured the study variables and produced stable, dependable results over repeated use. In this study, reliability was assessed during the pilot phase using Cronbach's Alpha coefficient to determine the internal consistency of items within each variable related to project planning practices and health service delivery. Cronbach's Alpha values were computed for each study variable, and coefficients above the acceptable threshold indicated that the instruments were reliable for data collection. This process helped confirm that the questionnaire items were coherent, consistent, and capable of generating trustworthy findings for the study.

Table 3: Reliability Analysis

Variable	Cronbach's Alpha	Comments
Project Needs Assessment	0.844	Reliable
Project Resource Funding	0.923	Reliable
Project Scope Definition	0.880	Reliable
Project Team Competency	0.842	Reliable
Health Service Delivery	0.867	Reliable

Source: **Pilot data results**, (2026)

The results presented in Table 3 show that all the study variables achieved high reliability scores, with Cronbach's Alpha values ranging from 0.842 to 0.923, indicating that the research instrument is consistently measuring the intended constructs. Specifically, Project Resource Funding recorded the highest reliability coefficient at 0.923, followed by Project Scope Definition at 0.880, while Project Team Competency and Project Needs Assessment had slightly lower but still acceptable scores of 0.842 and 0.844, respectively. The dependent variable, Health Service Delivery, also demonstrated strong reliability with a Cronbach's Alpha of 0.867. This level of reliability ensures that responses obtained from the instrument are stable, dependable, and replicable across similar

samples, making it suitable for assessing the influence of project planning practices such as needs assessment, resource funding, scope definition, and team competency on health service delivery in Kibaya Health Post, Rwanda (Mugenda & Mugenda, 2022; Takom *et al.*, 2025).

3.6 Data Processing Analysis

Quantitative data were cleaned, coded, and analyzed using SPSS version 28. Descriptive statistics (frequencies, percentages, means, standard deviations) summarized demographic characteristics and levels of needs assessment practices and service delivery outcomes. Inferential analyses included Pearson correlation coefficients to examine bivariate relationships and multiple linear regression to test the combined influence of needs assessment dimensions (X_1–X_4) on health service delivery (Y), controlling for facility-level covariates (Baker, 2022; Johnson et al., 2023). The regression model was specified as:

The regression analysis was

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \quad \ldots\ldots(2)$$

Y= Health service delivery (dependent variable)

β_0=constant (co-efficient of intercept)

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$, are regression coefficients to be estimated

X_1=Project needs assessment, X_2=Project resource funding, X_3= Project scope definition, X_4= Project team competency, ε= Error term. Assumptions of normality, linearity, homoscedasticity, and multicollinearity were tested prior to model estimation (Taber, 2022).

Qualitative data underwent thematic analysis following Braun and Clarke's (2022) six-phase approach: familiarization, initial coding, theme development, review, definition, and reporting. NVivo 14 facilitated systematic coding and retrieval of emergent themes related to planning-service linkages. Integration occurred through a convergent mixed-methods matrix, where quantitative and qualitative findings were juxtaposed to identify convergence, complementarity, or divergence, enabling nuanced interpretation of how needs assessment influences service delivery in Kibaya (Creswell & Plano Clark, 2023; Ivankova et al., 2024). Results were presented using tables, charts, narrative synthesis, and illustrative quotes to ensure both statistical rigor and contextual depth.

4.0 Results and Findings

4.1 Correlation Analysis

Correlation analysis was conducted to examine the strength and direction of the relationship between project planning practices and health service delivery in Kibaya Health Post, Rwanda. The analysis focused on determining how project needs assessment, project resource funding, project scope definition, and project team competency are associated with health service delivery outcomes. Pearson’s correlation coefficient was used to measure the degree of linear relationship between the variables, where positive values indicate a direct relationship and negative values indicate an inverse relationship. The results provide important insights into how closely each project planning practice is linked to improvements in health service delivery. Therefore, Table 4 presents the correlation matrix showing the relationships among all study variables.

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Table 4: Correlation Matrix

		Health service delivery	Project needs assessment	Project resource funding	Project scope definition	Project team competency
Health service delivery	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	96				
Project needs assessment	Pearson Correlation	.558**	1			
	Sig. (2-tailed)	.000				
	N	96	96			
Project resource funding	Pearson Correlation	.486**	.389**	1		
	Sig. (2-tailed)	.000	.000			
	N	96	96	96		
Project scope definition	Pearson Correlation	.327**	.045	.120	1	
	Sig. (2-tailed)	.001	.664	.244		
	N	96	96	96	96	
Project team competency	Pearson Correlation	.437**	.290**	.376**	.055	1
	Sig. (2-tailed)	.000	.004	.000	.596	
	N	96	96	96	96	96

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Primary data (2026)

Table 4 presents the correlation analysis examining the relationship between project planning practices and health service delivery in Kibaya Health Post, Rwanda. The findings reveal that all project planning variables have a positive relationship with health service delivery, though the strength of the relationships varies. Project needs assessment had the strongest and statistically significant association ($r = 0.558$, $p < 0.01$), indicating that better identification of community health needs is closely linked to improved service delivery. Project resource funding also showed a moderate significant relationship ($r = 0.486$, $p < 0.01$), suggesting that sufficient financial support enhances health outcomes. Likewise, project team competency demonstrated a moderate positive correlation ($r = 0.437$, $p < 0.01$), while project scope definition showed a weaker but significant relationship ($r = 0.327$, $p < 0.01$). The findings further revealed significant interrelationships among planning variables, particularly between needs assessment and resource funding, and between funding and team competency, indicating that project planning components are interconnected and collectively contribute to improved health service delivery, consistent with recent studies and international development perspectives.

4.2 Multiple Regression Analysis

Multiple regression analysis was conducted to determine the combined effect of project planning practices namely project needs assessment, project resource funding, project scope definition, and project team competency on health service delivery in Kibaya Health Post, Rwanda. This analysis helped to establish how well the independent variables jointly predict variations in health service

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delivery outcomes. Therefore, Table 5 presents the combined model summary of the multiple regression analysis. The results indicate a strong positive relationship between the independent variables (project needs assessment, project resource funding, project scope definition, and project team competency) and health service delivery, as shown by the correlation coefficient (R = 0.716). The coefficient of determination ($R^2 = 0.513$) implies that 51.3% of the variations in health service delivery are explained by the combined effect of the four project planning practices, while the adjusted R^2 of 0.492 confirms the model's reliability in predicting health service delivery outcomes. The Durbin-Watson statistic of 2.378 indicates that there is no significant autocorrelation in the residuals, confirming that the regression model is statistically appropriate and reliable for interpretation. The results align with United Nations Development Programme (2023), which highlights that well-structured project planning frameworks significantly enhance service delivery efficiency by improving coordination, resource utilization, and implementation effectiveness.

Table 5: Combined Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.716[a]	.513	.492	.21149	2.378

a. Predictors: (Constant), Project Team Competency, Project Needs Assessment, Project Resource Funding, Project Scope Definition

b. Dependent Variable: Health Service Delivery

Source: Primary data (2026)

Table 6 displays the ANOVA results that evaluate the regression model's overall significance in relation to the impact of project planning practices on the delivery of health services in the Kibaya Health Post, Rwanda. The results demonstrate that the model is statistically significant ($F = 23.974$, $p = 0.000$), suggesting that the delivery of health services is significantly influenced by project requirements assessment, resource funding, scope definition, and team competency. The results also indicate that these variables account for a significant portion of the variation in health service delivery, which supports the model's predictive capabilities. The relationships are unlikely to be due to chance, as evidenced by the low significance value ($p < 0.05$). This illustrates the significant role that integrated project planning practices collectively play in enhancing health service delivery outcomes.

Table 6: Combined ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.289	4	1.072	23.974	.000[b]
	Residual	4.070	91	.045		
	Total	8.360	95			

a. Dependent Variable: Health Service Delivery

b. Predictors: (Constant), Project Team Competency, Project Needs Assessment, Project Resource Funding, Project Scope Definition

Source: Primary data (2026)

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The findings indicate that all independent variables have a positive and statistically significant effect on health service delivery. Project needs assessment has the strongest positive influence (β = 0.398, p = 0.000), implying that improvements in identifying community health needs significantly enhance health service delivery outcomes. This is consistent with recent evidence that effective needs assessment is a fundamental driver of responsive and efficient primary healthcare systems (World Health Organization, 2023). Similarly, project scope definition also shows a strong positive and significant effect (β = 0.271, p = 0.000), indicating that clear definition of project boundaries and deliverables improves implementation efficiency and service delivery effectiveness.

The results further reveal that project team competency positively and significantly influences health service delivery (β = 0.227, p = 0.006), suggesting that skilled and well-coordinated teams enhance planning and implementation of health post projects. Project resource funding also has a positive and significant effect (β = 0.213, p = 0.013), indicating that adequate financial and material resources contribute to improved service delivery outcomes. These findings are supported by World Bank (2024), which emphasizes that effective financing and human resource capacity are essential for strengthening health systems performance in developing contexts. Overall, the regression results confirm that all four project planning practices significantly contribute to improved health service delivery, with needs assessment and scope definition emerging as the most influential factors, consistent with United Nations Development Programme (2023).

Table 7: Coefficient results for all Variables

Model			Unstandardized Coefficients		Standardized Coefficients		
			B	Std. Error	Beta	t	Sig.
1	(Constant)		-.324	.524		-.618	.538
	Project Needs Assessment		.363	.074	.398	4.936	.000
	Project Resource Funding		.217	.085	.213	2.547	.013
	Project Scope Definition		.297	.081	.271	3.674	.000
	Project Team Competency		.228	.081	.227	2.832	.006

a. Dependent Variable: Health Service Delivery

Source: Primary data (2026)

The overall regression equation can be represented as:

Health Service Delivery = -0.324+ 0.363 Project Needs Assessment + 0.217 Project Resource Funding + 0.297 Project Scope Definition + 0.228 Project Team Competency

The overall regression equation indicates that health service delivery in Kibaya Health Post, Rwanda is influenced by a combination of project planning practices, including project needs assessment, project resource funding, project scope definition, and project team competency. The constant value (-0.324) suggests that when all independent variables are held constant, health service delivery would slightly decrease, although this effect is not statistically significant (p = 0.538). This highlights the importance of accurately identifying and integrating community health needs in project planning, which is strongly supported by recent health systems literature

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emphasizing needs-based planning as a key driver of improved service delivery outcomes (World Health Organization, 2023).

Additionally, the model shows that project scope definition contributes 0.297 units, project team competency contributes 0.228 units, and project resource funding contributes 0.217 units to improvements in health service delivery. These results indicate that while all variables positively influence service delivery, their relative strengths differ, with scope definition and team competency playing substantial roles in ensuring effective implementation and coordination of health post projects. Adequate resource funding also remains essential for sustaining operations and improving service quality. These findings are consistent with World Bank (2024) and United Nations Development Programme (2023), which emphasize that integrated project planning practices combining financial, technical, and human resource components are critical for achieving efficient and sustainable health service delivery in community-based health systems.

4.3 Discussion of the Findings

The study's findings reveal that structured needs assessment and clear scope definition significantly enhance health service delivery at Kibaya Health Post, with respondents strongly agreeing that planning processes were evidence-based and community-aligned (composite means = 4.35 and 4.46, respectively). The high rating for scope clarity (mean = 4.63 for reducing stakeholder misunderstandings) underscores how well-defined project boundaries minimize ambiguity, streamline coordination, and ensure that services directly address prioritized community health issues. This aligns with recent evidence indicating that participatory needs identification and precise scope articulation are foundational to responsive primary healthcare delivery, particularly in decentralized systems where local context dictates service relevance (Mugisha et al., 2022; World Health Organization [WHO], 2023). By embedding community health priorities into project design, Kibaya Health Post demonstrated how forward-looking planning reduces service fragmentation and enhances the alignment between intended outputs and actual population needs (Rwanda Ministry of Health [MoH], 2024).

Despite generally positive perceptions, resource funding emerged as the most variable planning dimension (composite mean = 4.31, SD up to 1.041), reflecting underlying tensions between budget adequacy, timely disbursement, and service continuity. Respondents acknowledged that sufficient funding directly improved medicine availability and staff retention, yet also recognized that financial constraints compromise service quality when disbursements are delayed or misaligned with operational demands. This duality mirrors broader health financing challenges in low-resource settings, where unpredictable funding flows disrupt supply chain stability and limit the scalability of community health interventions (Kabanda & Uwimana, 2023; World Bank, 2024). However, the strong agreement on effective financial management (mean = 4.45) suggests that transparent budgeting and accountability mechanisms at the health post level can mitigate funding volatility. Recent studies emphasize that integrating performance-based financing and real-time expenditure tracking into primary healthcare projects significantly enhances resource utilization and service delivery consistency (Nzeyimana et al., 2022; Global Health Partners, 2025).

Project team competency was identified as a critical driver of implementation efficiency, with respondents highlighting the impact of skilled personnel, clear role allocation, and effective leadership on timely service delivery (composite mean = 4.38). The highest-rated item in this domain—effective leadership supporting project success (mean = 4.56)—reinforces contemporary

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project management literature that positions frontline leadership as a catalyst for team cohesion, adaptive decision-making, and quality assurance in health interventions (Adeyemi & Okafor, 2023; Project Management Institute [PMI], 2024). Furthermore, the strong agreement on training adequacy and role clarity suggests that continuous capacity building for health post staff and community health workers directly translates into improved clinical competence and patient-centered care. Empirical research in East African primary healthcare settings confirms that competency-focused project planning reduces implementation bottlenecks, enhances health worker motivation, and strengthens community trust in decentralized service delivery models (Kagabo et al., 2021; United Nations Development Programme [UNDP], 2023).

Collectively, the descriptive findings demonstrate that robust project planning practices—spanning needs assessment, scope definition, resource funding, and team competency—exert a strong positive influence on health service delivery outcomes at Kibaya Health Post, as reflected in the highest composite mean for service delivery (4.50). The consistency across planning dimensions suggests that structured, participatory, and competency-driven project design is integral to achieving timely, accessible, and high-quality primary healthcare in Rwanda's community-based system. These results corroborate recent global health evidence that systematic planning reduces service gaps, optimizes resource allocation, and enhances health system resilience at the grassroots level (WHO, 2022; Bishanga et al., 2024). For policymakers and district health managers, these findings underscore the need to institutionalize standardized project planning frameworks, strengthen financial forecasting mechanisms, and invest in frontline health leadership to sustain service delivery improvements across Rwanda's decentralized health network.

5.1 Conclusions of the study

5.1.1 Project Needs Assessment

The study concludes that project needs assessment has a strong and positive influence on health service delivery in Kibaya Health Post, Rwanda. The findings demonstrate that when health needs are properly identified, prioritized, and integrated into planning processes, health services become more relevant, efficient, and responsive to community demands. Therefore, effective needs assessment is a fundamental driver of improved health service delivery outcomes in health post projects.

5.1.2 Project Resource Funding

The study concludes that project resource funding significantly influences health service delivery in Kibaya Community. Adequate, timely, and well-managed financial and material resources enhance service availability, staffing, and continuity of care, while funding constraints negatively affect service quality and efficiency. Therefore, sustainable resource mobilization and effective financial management are essential for strengthening health post-performance.

5.1.3 Project Scope Definition

The study concludes that project scope definition plays a positive and significant role in improving health service delivery. Clearly defined project scope enhances coordination, reduces misunderstandings, minimizes delays, and improves resource utilization during implementation. Therefore, effective scope management ensures that health post projects remain focused, efficient, and aligned with community health needs.

5.1.4 Project Team Competency

The study concludes that project team competency has a significant positive effect on health service delivery in Kibaya Community. Skilled, experienced, and well-coordinated project teams improve planning, implementation, communication, and overall project performance. Therefore, strengthening team capacity through training, leadership development, and clear role assignment is essential for effective health service delivery.

5.2 Recommendations

5.2.1 Recommendations for Practice

The study recommends that health post project implementers strengthen needs assessment processes by ensuring continuous community engagement and evidence-based data collection to improve service relevance. Additionally, project teams should enhance financial planning and monitoring systems to ensure timely availability and efficient use of resources. Furthermore, clearer scope definition and regular communication among stakeholders should be emphasized to minimize implementation delays and improve coordination. Finally, continuous capacity building programs should be introduced to enhance team skills, leadership, and technical competencies in project planning and implementation.

5.2.2 Recommendations for Policy

The study recommends that policymakers within the health sector strengthen guidelines on participatory needs assessment to ensure all community health projects are aligned with actual population needs. There is also a need to improve funding mechanisms by ensuring timely disbursement and sustainable financing of health post projects. In addition, policies should enforce standardized project scope management frameworks to improve accountability and efficiency. Finally, national health policies should prioritize continuous training and professional development of health project teams to enhance service delivery performance.

5.3 Recommendations for Further Research

Further research is recommended to explore the long-term sustainability of health service delivery outcomes resulting from project planning practices in rural health posts. Future studies should also examine the role of digital technologies in improving needs assessment, resource management, and project monitoring in community health projects. Additionally, comparative studies across different districts in Rwanda are encouraged to identify contextual differences in project planning effectiveness. Lastly, qualitative studies focusing on patient experiences could provide deeper insights into how project planning practices directly affect perceived quality of health services.

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