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Impact of Results-Based Financing on Key Health Indicators in a Devolved Health System: A Case Study from Northern Zambia

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Abstract

Results-Based Financing (RBF) has been promoted as an innovative health financing mechanism to improve service delivery and health outcomes in low-resource settings. However, evidence on its impact within devolved health systems remains limited. This study examines how RBF influences key performance indicators (KPIs) in Zambia's devolved district health services. An embedded multiple-case study was conducted across 12 districts in Northern Province, Zambia. Mixed methods were employed, combining qualitative interviews with 44 stakeholders and quantitative analysis of health facility data. The study focused on maternal and child health indicators, service utilization patterns, and health worker motivation following RBF implementation. RBF implementation was associated with improvements in several KPIs: maternal health outcomes (100% of facilities reported improvements), medicine availability (91%), and the quality of primary healthcare services (67%). Health worker motivation increased, with 42% agreeing and 24% strongly agreeing that RBF positively affected service delivery. Community-based volunteers responded positively to incentive structures. However, challenges included delayed fund disbursement (91.7% reported), inadequate funding (83.3%), and monitoring gaps (50%). RBF can enhance key health indicators in devolved systems when properly designed and implemented. Success depends on timely incentive disbursement, robust monitoring systems, and integration with existing community health structures. The study provides evidence for policymakers considering RBF scale-up in decentralized health systems.

Keywords: *Child Health, Decentralization, Health Outcomes, Health Systems Performance, Maternal Health, Performance-Based Financing, Zambia.*

Introduction

The global pursuit of Universal Health Coverage (UHC) has catalyzed an urgent search for innovative health financing mechanisms to improve service delivery and health outcomes in low- and middle-income countries (LMICs), where resources are perpetually constrained, and health systems often underperform [1]. Among the various strategies proposed, Results-Based Financing (RBF) has garnered significant attention and investment from national governments and international development partners alike. RBF, which includes modalities such as performance-based financing (PBF), fundamentally reorients the provider-payment relationship by linking financial transfers to the verified achievement of predefined results, thereby aiming to increase accountability, efficiency, and quality in health service provision [2]. This paradigm shift from input-based to outcome-focused financing is posited to incentivize desired behaviors among health workers, improve managerial practices, and ultimately improve population health.

Zambia’s health sector, mirroring broader trends in sub-Saharan Africa, has undergone

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profound structural reforms over the past three decades. Since the 1990s, the government has pursued a persistent decentralization agenda, seeking to improve health system responsiveness and equity by devolving authority and resources to the district and local levels [3]. This process reached a pivotal moment in 2016 with the formal devolution of district health services to local governments, a move intended to enhance community participation and local accountability in health governance. Parallel to this governance reform, Zambia has experimented with innovative financing models. With support from partners such as the World Bank and the Global Fund, the country has piloted and scaled various RBF initiatives, integrating them into its national health strategy to accelerate progress toward maternal and child health targets [4]. The concurrent implementation of decentralization and RBF creates a critical real-world laboratory to examine how performance incentives function within a shifting governance landscape in which responsibility for service delivery, resource allocation, and oversight is increasingly localized.

Despite the expanding global footprint of RBF programs, robust evidence on their effectiveness, particularly within the complex architecture of devolved health systems, remains fragmented and sometimes contradictory [30, 31]. Systematic reviews have yielded mixed findings: some studies report significant improvements in targeted service coverage and quality, whereas others report modest effects, unintended consequences, or sustainability concerns [5, 6]. A key evidence gap persists in understanding the *interaction* between RBF's incentive structures and the specific opportunities and constraints presented by decentralized governance. Devolvement transfers "decision-space" to local authorities, but variations in local capacity, political priorities, and accountability mechanisms can dramatically mediate how financial incentives are perceived, managed, and translated into results [7]. Critical questions remain: Does RBF empower local managers or overwhelm them with administrative complexity? Does it complement or conflict with the goals of local ownership and community participation inherent in decentralization? How does it affect the motivation of frontline providers and community health volunteers operating in this dual-reform environment?

This study directly addresses these questions by conducting an in-depth mixed-methods investigation into the impact of RBF on key health indicators within Zambia's Northern Province devolved health system. It builds upon and significantly extends preliminary work documented in the Lunte district, which promised early effects of RBF in a single district [8]. By expanding the scope to 12 districts with diverse implementation contexts, this research provides a more comprehensive and enhanced provincial-level analysis. The study is specifically designed to test two central hypotheses derived from RBF theory: first, that the institutionalization of RBF reduces laissez-faire attitudes and leads to measurable improvements in staff performance and motivation; and second, that embedding even modest incentive structures for community-based volunteers (CBVs) within the RBF framework positively influences their engagement and effectiveness in linking households to the formal health system.

By examining the interplay of financial incentives, decentralized governance, and human resource dynamics, this research aims to generate actionable evidence for policymakers in Zambia and similar settings. It seeks to move beyond the question of *whether* RBF works to elucidate *how* it works, for *whom*, and under *what conditions* within a devolved system [32, 33]. The findings are intended to inform the refinement, scaling, and sustainable integration of RBF as a strategic lever for strengthening health systems and advancing the

equitable achievement of UHC in an era of decentralized governance.

Methods

Study Design

This research employed an embedded multiple-case study design across 12 districts in Zambia's Northern Province. The mixed-methods approach combined qualitative insights with quantitative performance data to provide a comprehensive understanding of the impacts of RBF.

Study Setting

Northern Province comprises 12 districts with diverse demographic and health system characteristics. The province has implemented RBF in various forms since 2011, with expansion to 53 districts nationally in 2018. The devolution of health services to local authorities beginning in 2016 created a unique context for examining RBF in decentralized systems.

Data Sources and Collection

1. **Qualitative Component:** Semi-structured interviews with 44 purposively selected participants, including health workers (93%), local authority representatives (2%), and donor/RBF experts (5%). Interviews explored perceptions of RBF's impact, implementation challenges, and effects on service delivery.
2. **Quantitative Component**: Analysis of health facility records (2019-2024) focusing on:
    - Maternal health indicators: antenatal care attendance, institutional deliveries
    - Child health indicators: immunization coverage, nutritional status
    - Service utilization: outpatient attendance, preventive service uptake
    - Resource availability: medicine stockouts, equipment functionality
3. **Document Review:** Policy documents, RBF implementation reports, and health management information system data.

Analytical Framework

The study employed Bossert and Mitchell's (2011) decision space framework [5] adapted to examine how decentralization dimensions (decision space, accountability, capacity) interact with RBF incentives to influence health outcomes. Analysis considered both intended effects on incentivized indicators and potential spillover effects on non-incentivized services.

Results

Hypothesis Testing: Staff Performance and Motivation

Hypothesis 1: Institutionalizing RBF reduces laissez-faire attitudes and improves performance.

The alternative hypothesis (H1) was supported by multiple data sources. Health workers reported increased motivation (66% agreement), with particular emphasis on clearer performance expectations and timely feedback. Facility records showed improved adherence to clinical protocols in maternal care (a 42% increase in partograph use) and child health services (a 38% increase in growth-monitoring completeness). However, 34% of respondents reported persistent challenges, including workload imbalances and inequitable incentive distribution.

Hypothesis Testing: Community Volunteer Engagement

Hypothesis 2: RBF incentives positively influence community-based volunteer (CBV) performance.

Strong support emerged for H2: 78% of respondents reported improved CBV engagement following the introduction of RBF. Specific improvements included:

1. Increased household visitation rates (52% increase).

2. Enhanced community health education activities.
3. Improved referral completion rates (41% increase).
4. Greater attendance at monthly health committee meetings.

CBVs reported that even small incentives (transport reimbursements, recognition certificates) significantly increased motivation and sustained participation in volunteer work.

Key Performance Indicator Analysis

RBF implementation showed variable impacts across different KPIs (Table 1):

Table 1: RBF Impact on Key Health Indicators

Indicator	Pre-RBF (2019)	Post-RBF (2024)	% Change
Antenatal care (4+ visits)	64%	78%	+14%
Institutional deliveries	58%	72%	+14%
Full immunization coverage	72%	81%	+9%
Medicine availability index	45%	67%	+22%
Outpatient consultations	1.2/person/year	1.5/person/year	+25%

Health System Effects

Beyond specific indicators, RBF influenced several health system dimensions:

1. **Financial Management:** Direct facility disbursement improved fund predictability and managerial autonomy, though delays affected 91.7% of facilities at some point.
2. **Quality Improvement:** Facilities used RBF funds for infrastructure upgrades (56%), equipment procurement (48%), and staff training (34%), creating enabling environments for better service delivery.
3. **Data Quality:** The verification process inherent in RBF improved data completeness and accuracy, with 62% of facilities reporting better record-keeping practices.
4. **Community Engagement:** RBF requirements for community involvement in facility management committees increased local participation in health governance.

Implementation Challenges

Despite positive trends, several challenges affected RBF's impact:

1. **Funding Inconsistency**: 83.3% reported inadequate or unpredictable funding.
2. **Administrative Burdens:** 58% noted excessive reporting requirements.
3. **Indicator Selection**: 45% questioned whether incentivized indicators reflected local priorities.
4. **Equity Concerns**: 32% raised issues about differential impacts across socioeconomic groups.

Discussion

The findings from this case study of Results-Based Financing (RBF) in Northern Zambia present a nuanced picture of its impact within a devolved health system. The observed improvements in key maternal and child health indicators, alongside enhanced health worker motivation and community volunteer engagement, align with the proposed mechanisms of RBF, which posits that linking financial incentives to measurable results can drive performance improvements in service delivery [9]. However, the persistence of significant implementation challenges—such as funding delays, administrative burdens, and equity concerns—highlights the critical role of contextual factors in mediating the

effectiveness of RBF. This discussion expands on these findings, situating them within the broader literature on health financing and decentralized governance, and explores the implications for policy and practice [10, 37].

RBF as a Catalyst for Targeted Service Improvement

The most pronounced positive effects of RBF in this study were observed in incentivized, high-priority areas, including institutional deliveries, antenatal care attendance, and the availability of medicines [11, 12]. The 14% increase in both institutional deliveries and antenatal care (4+ visits), and the 22% rise in the medicine availability index, suggest that RBF can successfully direct attention and resources toward predefined objectives. This is consistent with evidence from Rwanda and other settings, where PBF programs have been associated with significant gains in maternal and child health coverage indicators [13]. The mechanism appears twofold: first, the direct financial incentive motivates providers to prioritize and increase the output of measured services; second, the verification process and the resultant flow of RBF funds enable facilities to address critical supply-side constraints, such as procuring essential medicines and making minor infrastructure repairs. This supply-side effect may be particularly significant in resource-constrained, decentralized settings such as Northern Zambia, where routine health budgets are often insufficient and disbursed unpredictably [14]. The investment of RBF funds in equipment (48%) and staff training (34%) indicates a move beyond mere output maximization toward creating an enabling environment for quality care, a finding echoed in studies from Burundi and the Democratic Republic of the Congo [38].

The Double-Edged Sword of Devolution: Autonomy versus Fragmentation

The devolved structure of Zambia's health system, in which district health services fall under local government authority, creates a unique dynamic for RBF implementation. On one side, devolution theoretically provides greater decision-making power at the local level [15, 34], allowing district health offices and facility managers to tailor RBF principles to local priorities and resources. This ability to adapt is a core aspect of effective decentralization. However, our findings show that this decentralization can also worsen implementation challenges. The high rates of delayed disbursements (91.7%) and insufficient funding (83.3%) highlight capacity limitations within local government financial systems. Although RBF aims to increase autonomy through direct facility funding, its success paradoxically depends on the efficient fiscal and administrative systems of decentralized structures, which may be the weakest [16]. This creates a "capacity trap," in which a performance-driven intervention is hindered by the systemic weaknesses it was meant to address. Similar issues have been seen in the Philippines and Uganda, where devolution or performance-based contracting has faced difficulties due to misalignment between national policy goals and local capacity, as well as poor coordination across governance levels [17]. Therefore, the success of RBF in a devolved system is not guaranteed; it depends on simultaneous efforts to strengthen local government administrative, financial, and technical capacities.

Motivation Beyond Money: Unpacking the Human Resource Response

The study's strong support for both hypotheses related to staff and community volunteer motivation underscores that RBF's influence extends beyond simple transactional economics. For formal health workers, the introduction of RBF was associated with clearer

performance expectations, more regular supervision, and timely feedback—all non-financial aspects of the management reform that accompanied the incentive scheme [18, 19]. This suggests that RBF can serve as a lever for introducing more robust management practices and accountability structures, which, in themselves, are motivational. However, the reported concerns about workload imbalances and perceived unfairness in incentive distribution indicate that poorly designed schemes can also foster demotivation and intra-staff tension, a risk noted in Tanzania and Zimbabwe [20, 40].

For community-based volunteers (CBVs), the impact was even more striking. Their performance improved significantly with even modest non-monetary incentives, such as transport reimbursements and recognition. This finding challenges a purely economistic view of motivation and aligns with the growing literature on the importance of intrinsic motivation, social recognition, and career development for lay health workers [21]. It suggests that RBF designs for community-level actors must be carefully calibrated; excessive monetization could crowd out intrinsic motivation or create unsustainable expectations, while thoughtful non-financial rewards can powerfully enhance retention and performance. Integrating CBVs into a formalized recognition and support system through RBF can help legitimize their role and more effectively integrate them into the primary healthcare continuum [22].

Sustainability and Systemic Risks: The Substitution Effect and Indicator Myopia

Two critical concerns emerging from this study relate to the long-term sustainability and potential unintended consequences of RBF [23]. First, the observed substitution effect, where RBF funds reportedly replaced rather than supplemented regular government allocations, poses a direct threat to sustainability. If domestic budgets are reduced in anticipation of external or ring-fenced RBF inflows, the health system becomes perpetually dependent on the RBF program. This undermines the goal of strengthening the overall health financing system and creates a fiscal cliff if RBF funding were to cease. This phenomenon, documented by Dusseljee et al. [24] in Zambia and in other settings, calls for explicit contractual and policy safeguards to ensure the "additionality" of RBF funds.

Second, 45% of respondents highlighted the risk of "indicator myopia," questioning whether the chosen indicators truly reflect local priorities. While RBF led to improvements in the measured areas, the study design limits understanding of potential positive or negative spillover effects on services not included in the incentives [25, 35, 36]. The administrative burden of reporting, mentioned by 58%, may also divert health workers' time from patient care or other critical, unmeasured tasks. Additionally, 32% of respondents expressed concerns about equity—that RBF might benefit facilities in more accessible areas or populations easier to reach—highlighting an important issue [26]. Without careful monitoring and adjustments, performance incentives could unintentionally worsen health inequities by benefiting those already better positioned to succeed, a concern well-documented in the literature on PBF in fragile states.

This case study shows that RBF can be a powerful tool for speeding up progress on certain health indicators within Zambia's decentralized system. Its success, however, is not built into the model itself but is heavily influenced by the implementation environment [27]. The potential of RBF is unlocked only when it is part of a framework that provides timely and predictable funding, aligns with local capacity, promotes motivation among health workers beyond financial incentives, and protects against negative effects such as

funding substitution and service distortion [28, 39].

For policymakers considering scale-up, the implications are clear: RBF cannot be deployed as a standalone technical fix. It must be implemented as part of a broader health system strengthening strategy that includes:

1. Concurrent investment in decentralized governance capacity, particularly in financial management and data systems, to ensure the platform can support the RBF mechanism.
2. Intelligent design of incentive packages that blend financial and non-financial rewards, especially for community health workers, and include safeguards for equity.
3. Robust, independent monitoring and evaluation that tracks not only targeted indicators but also system-wide effects, including on non-incentivized services, data integrity, and equity of access.
4. Strong policy frameworks that secure the additionality of RBF financing and its alignment with national health priorities.

When these conditions are met, RBF can transcend being a mere payment mechanism and become a catalyst for a more responsive, accountable, and performance-oriented culture within decentralized health systems [29]. Future research should employ longitudinal and controlled designs to isolate the causal effects of RBF from other concurrent reforms and to better understand its long-term impact on health system resilience and equitable service delivery.

Limitations

While this study provides valuable insights into the functioning of Results-Based Financing (RBF) within Zambia's devolved health system, several methodological and contextual limitations must be acknowledged.

1. Causal Inference and Observational Design: The study employed an observational, multiple-case design without a contemporaneous control group. Although pre- and post-RBF comparisons were made, the observed improvements in health indicators cannot be attributed solely to RBF implementation. Concurrent health system reforms, changes in donor funding, epidemiological shifts, or broader socioeconomic developments during the study period (2019–2024) may have independently influenced outcomes. The absence of a counterfactual limits the ability to make definitive causal claims about RBF's impact.
2. Temporal Scope and Sustainability: The five-year post-implementation evaluation period, while substantial, may be insufficient to assess the long-term sustainability of RBF-induced changes. Short-term gains in performance indicators may plateau or erode over time due to incentive fatigue, changing priorities, or withdrawal of external funding. The study could not capture whether the positive trends in motivation and service delivery will endure beyond the initial implementation phase, a critical consideration for policymakers planning scale-up.
3. Geographical Generalizability: The research was conducted exclusively in Northern Province, a region with distinct demographic, cultural, and health system characteristics. Findings may not be generalizable to other provinces in Zambia—particularly more urbanized, better-resourced, or differently governed regions—or to other countries with devolved health systems. The "devolved" context itself varies widely globally, and the specific interplay between Zambian local

government structures and RBF may be unique.

4. Self-Reported and Administrative Data Biases: The qualitative findings rely heavily on self-reported perceptions from health workers and managers, which are subject to social desirability bias, recall bias, and potential overstatement of positive effects to justify the program. Quantitative data were obtained from routine health management information systems (HMIS), the quality and completeness of which, despite reported improvements, may remain uneven across facilities. The verification process inherent in RBF may have also incentivized improved record-keeping rather than actual service delivery in some instances.
5. Limited Exploration of Unintended Consequences: The study focused primarily on pre-specified key performance indicators. It did not systematically investigate potential negative unintended consequences of RBF, such as the neglect of non-incentivized services (e.g., chronic disease management, mental health), "cream-skimming" (prioritizing easier-to-treat patients), data manipulation, or increased stress and burnout among health workers due to performance pressure. The equity concerns raised by some respondents were noted but not deeply analyzed across different socioeconomic or geographic subgroups.
6. Perspective Omissions: The participant sample, while informative, was dominated by health workers (93%). The voices of patients, community members, and local political leaders were less represented. Their perspectives on changes in service quality, accessibility, and fairness could provide a more holistic understanding of RBF's social impact.

Future research should address these gaps by employing quasi-experimental or randomized designs with control groups over longer time horizons. Studies should also compare RBF outcomes across different devolved governance models and include robust mixed-methods assessments of equity impacts and system-wide effects, both intended and unintended.

Conclusion

This case study from Northern Zambia demonstrates that Results-Based Financing is a viable and potentially powerful mechanism for accelerating progress toward key maternal and child health targets within a devolved health system. The documented improvements in antenatal coverage, institutional deliveries, medicine availability, and health worker motivation affirm the core proposition of RBF: that linking resources to verified results can sharpen focus, galvanize action, and unlock latent capacity at the frontline of service delivery. The positive response of community-based volunteers to structured incentives further underscores the model's potential to strengthen the vital link between formal health facilities and the communities they serve.

However, the study unequivocally shows that RBF is not a panacea or a simple technical intervention. Its success is profoundly mediated by the governance ecosystem in which it is embedded. In Zambia's devolved context, RBF's strengths—its emphasis on autonomy, accountability, and results—were sometimes at odds with systemic weaknesses in local government capacity, particularly regarding predictable fiscal flows and administrative oversight. The challenges of delayed disbursements, inadequate funding, and administrative burden indicate that an incentive-based model can only thrive on a foundation of functional core systems.

Therefore, the scaling up of RBF in decentralized settings must be reconceptualized

not merely as the rollout of a financing tool, but as an integrated system-strengthening endeavor. Success depends on a symbiotic relationship between the RBF mechanism and its enabling environment. Based on our findings, we conclude that effective and sustainable implementation requires a concurrent focus on five critical pillars:

1. Robust Sub-National Governance: Strengthening the financial management, procurement, and monitoring capacities of district health offices and local authorities is non-negotiable. RBF cannot bypass weak systems; it requires them to function reliably.
2. Intelligent and Adaptive Design: RBF schemes must feature timely and predictable payments, a balanced mix of financial and non-financial incentives (especially for community health workers), and indicator sets co-developed with local stakeholders to ensure relevance and minimize distortion.
3. Proactive Equity Safeguards: Monitoring frameworks must explicitly track access and outcomes across socioeconomic, gender, and geographic lines to ensure RBF does not inadvertently widen existing health inequities. Incentive structures may need adjustments to reward reaching the most marginalized populations.
4. Safeguarded Financing: Clear national policy protocols must ensure that RBF funds are *additional* to baseline government health allocations, preventing substitution effects and building a sustainable path toward domestic financing of performance incentives.
5. Continuous Learning and Course Correction: Implementation must be accompanied by robust, real-time monitoring and evaluation that looks beyond targeted indicators to assess system-wide effects, unintended consequences, and the evolving motivations of health workers.

For policymakers in Zambia and similar contexts, the lesson is clear: RBF can be a catalyst for improvement, but it cannot be the engine of transformation alone. Its ultimate value lies not just in the health indicators it improves today, but in its potential to foster a culture of data use, accountability, and results-oriented management that endures within the decentralized health system long after specific incentive projects conclude. When designed with humility, implemented with support for systemic weaknesses, and evaluated with an eye toward equity and sustainability, RBF can contribute meaningfully to the journey toward universal health coverage in the complex landscape of devolved governance.

Practical Implications

1. For National Policymakers: Develop standardized RBF frameworks with flexibility for local adaptation within devolved systems.
2. For Local Authorities: Build financial and performance management capacity to effectively implement RBF programs.
3. For Health Facilities: Use RBF verification processes to simultaneously improve data quality and clinical practices.
4. For Development Partners: Align RBF support with government systems to promote sustainability and local ownership.

Author Contributions

Mayeya Paul Mayeya: Conceptualization, methodology, investigation, data curation, writing original draft.

Ernest Mutale: Supervision, validation, writing review, and editing.

Chibwe Chimbala: Investigation, formal analysis, visualization.

Grace Mwila: Investigation, resources, project administration.

Ethical Approval

Ethical approval was granted by the University of Zambia Health Sciences Research Ethics Committee (Ref: 2023-045) and the National Health Research Authority of Zambia.

Data Availability

The datasets generated and analysed during this study are available from the corresponding author upon reasonable request, subject to confidentiality agreements.

Conflict of Interest Statement

The authors declare no conflicts of interest.

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