

Adoption and Implementation of Framework Contracting for Essential Medicines in Ghana: Qualitative Insights from Stakeholders

Sarah Ama Kafui Okine

sarah.okine@moh.gov.gh

Ministry of Health

Brian Adu Asare

Ministry of Health

Desmond Dzidzornu Otoo

Health Technology Assessment Technical Working Group

Saviour Kwame Yevutsey

Ministry of Health

Maxwell Ayindenaba Dalaba

University of Health and Allied Sciences

Matilda Aberese-Ako

University of Health and Allied Sciences

Evelyn Ansah

University of Health and Allied Sciences

Mustapha Immurana

University of Health and Allied Sciences

Tuoyo Okorosobo

SAVING Consortium

Olumide Ogundahunsi

SAVING Consortium

Abraham Hodgson

SAVING Consortium

Margaret Gyapong

University of Health and Allied Sciences

Research Article

Keywords: Framework contracting, framework agreements, essential medicines, public procurement, pharmaceutical supply chain, medicine availability, health financing, qualitative case study, Ghana

Posted Date: October 19th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10899965/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Background

Access to essential medicines is a prerequisite for universal health coverage (UHC), yet in Ghana shortages, procurement delays, financing constraints and supply chain inefficiencies continue to constrain availability. The Ministry of Health introduced framework contracting (FWC) in 2018 to consolidate demand, improve price predictability and strengthen supplier relationships. Little empirical evidence exists on how the reform operates in practice, and published accounts do not specify the design parameters that govern its behaviour. This study examined the factors influencing its adoption and stakeholders' experiences of its implementation.

Methods

A qualitative case study combined a review of eleven legal, policy, technical and evaluation documents with in-depth interviews with ten purposively selected senior stakeholders from institutions responsible for the design, regulation, financing, implementation, supply and use of framework contracting. Coding was inductive and conducted in NVivo 14; transaction cost, institutional and agency theory framed interpretation rather than data collection or coding. Documentary and interview evidence were compared for convergence and divergence, and design parameters charted against international guidance. Reporting follows the Consolidated Criteria for Reporting Qualitative Research (COREQ).

Results

The arrangement appoints multiple suppliers per product at firm cedi prices with no standard adjustment formula and indicative volumes, while call-off and payment obligations rest with regional stores and teaching hospitals rather than the Ministry that negotiates price. Participants described FWC as a response to fragmented purchasing and considered it to have improved structure, price consistency and supplier accountability, but reported that these gains had not translated into uninterrupted availability. The documentary record showed substantial reductions in contract prices and supplier lead times alongside low supplier fill rates, weak forecast accuracy, continuing facility-level stockouts and accumulated indebtedness across the financing chain.

Conclusion

Framework contracting is better understood as a health system intervention than as a procurement mechanism. Its effect on availability depends on financing, supplier incentives, logistics and institutional coordination, and the supplier behaviour observed is consistent with the way the contract design allocates price, volume and payment risk. Reform confined to implementation is therefore unlikely to suffice: the design parameters require revision alongside strengthening of the complementary systems on which delivery depends.

Background

Among the most important determinants of public health outcomes and a foundation of efficient healthcare delivery is access to essential medicines. According to the World Health Organization, universal health coverage (UHC) depends critically on the accessibility and affordability of essential health products, including medicines [1]. Although global frameworks such as the Sustainable Development Goals (SDGs) provide a vision for healthcare equity, it remains challenging to translate these goals into practical, context-specific policies, especially in low- and middle-income countries.

Healthcare delivery in Ghana continues to be hindered by ongoing shortages of essential medicines, particularly at primary and district-level medical facilities [2, 3]. Critical medicines were regularly unavailable across service delivery sites, according to a nationwide survey conducted by Boateng et al. [3] under the Ghana National Pharmaceuticals Programme. Despite the Ministry of Health's 2020 policy commitments to strengthen supply chain channels, consistent medicine availability remains constrained by inefficiencies in procurement procedures, distribution logistics, and warehousing.

Public procurement is central to health service delivery in Ghana's resource-constrained context. Procurement systems directly influence not only the allocation of resources but also the quality and timeliness of healthcare interventions [4, 5]. However, conventional procurement methods have often been constrained by inefficiencies, high transaction costs, and administrative delays. Procurement is also the downstream expression of prior selection decisions: the medicines that reach the tender are those already listed through the Standard Treatment Guidelines and Essential Medicines List process, which is itself shaped by evidence use, negotiation, and stakeholder positioning [6, 7]. Weaknesses at either the selection or the procurement stage therefore propagate through the same chain to the point of dispensing.

To address these systemic challenges, the Ministry of Health adopted framework contracting (FWC) in 2018 as a reform strategy for the procurement of selected essential medicines. Framework contracting involves establishing pre-agreed terms with suppliers over a defined period, allowing call-off orders to be placed without repeating the full tendering cycle. In Ghana, framework agreements are provided for under the Public Procurement Act, 2003 (Act 663)[8] as amended by the Public Procurement (Amendment) Act, 2016 (Act 914)[9], which established framework agreements as a permitted method for goods and services procured repeatedly over a defined period. In the context of this study, framework contracting refers to the procurement arrangement implemented by Ghana's Ministry of Health through which selected suppliers are engaged under pre-established contractual terms to ensure the continuous and timely supply of essential medicines to public health facilities. Framework agreements are not a single instrument but a family of arrangements that differ along dimensions with material consequences for performance: whether one supplier or several are appointed per lot; whether call-off orders are placed directly against fixed terms or through a reopened mini-competition among appointed suppliers; whether prices are fixed for the full term or subject to an agreed

adjustment mechanism; and whether volumes are guaranteed or merely indicative. These design choices determine how price, demand, and payment risk are distributed between purchaser and supplier, and are therefore central to any assessment of how the Ghanaian arrangement performs [10, 11]. The model is widely credited with reducing lead times, improving cost-efficiency, and strengthening supplier responsiveness [12]. Because these parameters govern how the arrangement behaves, the design of the Ghanaian instrument is set out explicitly in Table 1 before the findings are presented. Three features are of particular importance for interpreting what follows. First, appointment is multi-supplier: from the second round onwards four responsive vendors were appointed per product, and the required quantity was divided between them in fixed proportions determined by price ranking, so competition is resolved at award and is not reopened at call-off. Second, prices are set in Ghana cedis and firm for the round, and no standard adjustment formula exists; upward revisions of 8 per cent in round one and 20 per cent in round two were negotiated after the event in response to currency depreciation and inflation. Third, although selection, tendering and price negotiation are centralised, the supply contracts are signed and the call-off orders placed by Regional Health Administrations, Regional Medical Stores and teaching hospitals as budget and management centres and are paid from drug revolving funds replenished by National Health Insurance Scheme reimbursement. Purchase obligation and payment risk therefore rest with decentralised units rather than with the Ministry that negotiated the price, and the quantities allocated at award are indicative rather than guaranteed.

Table 1
Design parameters of the framework contracting arrangement for essential medicines in Ghana

Design parameter	Ghanaian arrangement as documented	Source
Legal basis	Public Procurement Act, 2003 (Act 663) as amended by the Public Procurement (Amendment) Act, 2016 (Act 914). Award through national competitive tendering, advertised in national newspapers and on the Public Procurement Authority website.	[8, 9, 13]
Policy origin	Recommended in the Health Commodity Supply Chain Master Plan (2012); first implemented in 2018 with technical assistance from the USAID Global Health Supply Chain Programme GHSC-PSM.	[14, 15]
Scope and number of products	Round 1 (2018): 54 essential medicines. Round 2 (2019): 65. Round 3 (2020 to 2021): 65. Products selected on the criteria of high volume, high value and high supply risk.	[13, 16]
Selection and quantification	Undertaken by a technical working group drawn from the MoH Procurement and Supply Chain and Pharmacy Directorates, Ghana Health Service, Regional Medical Stores, teaching hospitals, NHIA, FDA and GHSC-PSM.	[13]
Term and cycle	One round per implementation cycle; selection, quantification, tendering, evaluation and price negotiation take approximately one year per cycle.	[13]
Appointment per product	Multi-supplier. Round 1 shared required quantities equally among selected vendors. Rounds 2 and 3 appointed four responsive vendors per product.	[13]
Quantity allocation	Round 2: 40 per cent to the lowest-priced vendor, 30 per cent to the second, and 15 per cent each to the third and fourth. Round 3: 40 per cent to the lowest-priced vendor, with the remaining three supplying at the negotiated median price.	[13]
Pricing model	Round 1 least-price model; round 2 least and average price model; round 3 least and median price model. Prices negotiated with vendors after financial evaluation.	[13]
Price basis and adjustment	Prices firm in Ghana cedis for the round, with no standard adjustment formula. Upward adjustments negotiated ad hoc: 8 per cent in round 1 and 20 per cent in round 2, with a further adjustment under discussion for round 3.	[13, 14]
Call-off basis	Direct call-off against pre-allocated quantities at negotiated prices. Competition is not reopened among appointed vendors at call-off stage.	[13]
Contracting and call-off authority	A memorandum of understanding is signed by the Minister for Health, teaching hospital chief executives and the Ghana Health Service Director-General. Individual supply contracts are signed, and call-offs placed, by Regional Health Administrations, Regional Medical Stores and teaching hospitals acting as budget and management centers.	[13, 14]
Volume commitment	Indicative rather than guaranteed. Facilities were frequently unable to call off the full quantities agreed at award.	[13]
Payment source	Drug revolving funds held by Regional Medical Stores and facilities, replenished from NHIS reimbursement and internally generated funds.	[14]

Despite Ghana's adoption of this approach, the available literature on framework contracting in the country remains largely descriptive, offering little critical analysis of the institutional processes and operational realities that shape implementation. Few studies have examined this mechanism in real-world situations, especially from the perspective of pharmaceutical stakeholders who are actively participating in its use. Where Ghanaian medicines and technology policy reforms have been examined institutionally, the analysis has concentrated on evidence generation and priority setting rather than on the contracting arrangements through which decisions are executed [17, 18], leaving the procurement interface comparatively unexamined. Hence, this study explored the factors that influenced the adoption of framework contracting and stakeholders' experiences with its implementation in Ghana's health sector. Two questions were addressed: first, what factors influenced the adoption of framework contracting for essential medicines in Ghana; and second, how do stakeholders positioned across the procurement, regulatory, financing, supply, and service delivery system experience its implementation?

The study was informed by three complementary bodies of theory. These were not used to structure data collection or to pre-specify a coding frame, both of which were inductive, but to frame the interpretation of the inductively derived themes and to situate them within an established explanatory vocabulary. Transaction cost economics directs attention to why purchasers move from repeated spot tendering towards longer-term governance arrangements when the costs of search, negotiation, contracting, monitoring, and enforcement become high, and when asset specificity and uncertainty make repeated market exchange inefficient [19, 20]. Institutional theory directs attention to the coercive, normative, and mimetic pressures through which reform models diffuse across organizational fields, including the influence of development partners and international procurement norms on national practice [21–23]. Agency theory directs attention to the alignment of interests and incentives between the purchaser as principal and suppliers as agents, and to how information

asymmetry and perceived payment risk shape supplier behaviour under contract [24]. Together, these perspectives frame framework contracting as a governance arrangement rather than a purely administrative procedure. They are applied in the discussion, where the themes generated inductively from participants' accounts are interpreted against them; they did not determine what was asked, what was coded, or which themes were generated.

Methods

Study Design

The study adopted a qualitative exploratory single-case study design to examine the factors that influenced the adoption of framework contracting in Ghana and how stakeholders positioned across the procurement, regulatory, financing, supply and service delivery system experience its implementation. The Ministry of Health's framework contracting system was adopted as a single case, while the various stakeholder institutions involved in its implementation (Ghana Health Service, National Health Insurance Authority, Public Procurement Authority, Food and Drugs Authority, pharmaceutical suppliers, and public health facilities) served as the embedded units of analysis. This design was appropriate because it allowed in-depth exploration of stakeholders' experiences and perceptions of a contemporary phenomenon such as framework contracting within its natural setting, allowing multiple institutional perspectives to be brought together without treating each institution as a separate case [25]. Consistent with the convention that case study designs draw on several sources of evidence, the study combined two strands: a review of documents governing the design, implementation and evaluation of the arrangement, and in-depth interviews with stakeholders positioned across it. Contemporaneous field notes formed a supplementary record. The documentary strand established what the arrangement formally provides for, and the interview strand established how actors positioned within it experienced its operation; points of convergence and divergence between the two are reported in the findings.

Study Area

The study was conducted in Ghana and focused on the national-level implementation of the framework contracting system for the procurement of essential medicines. The framework is implemented through multiple institutions, including the Ministry of Health (MoH), Ghana Health Service, National Health Insurance Authority (NHIA), Public Procurement Authority (PPA), Food and Drugs Authority (FDA), Central and Regional Medical Stores, pharmaceutical suppliers, health facilities, and development partners.

The Ministry of Health plays a central role as the government institution responsible for formulating health policies, coordinating national health sector programs, and providing strategic oversight of the procurement, distribution, management, and use of health sector goods, works, and services. The Ministry operates within Ghana's decentralized health system and provides policy direction to implementing agencies. The Procurement and Supply Chain Directorate of the Ministry implements and oversees framework contracting through its procurement unit. The procurement unit is responsible for procurement planning, tendering, supplier engagement, and contract administration, while the Pharmaceutical Services Directorate provides technical oversight of medicine selection, quantification, quality assurance, and supply chain coordination. However, the implementation and performance of framework contracting extend beyond the Ministry and involve multiple stakeholders whose actions collectively influence procurement efficiency and medicine availability.

Considering the nature of framework contracting and the multiplicity of institutions, the study examined perspectives from key stakeholders across the pharmaceutical procurement and supply chain system in and outside the MOH.

Study Population

The target population for this study comprised key stakeholders directly involved in the design, regulation, financing, implementation, supply, and utilization of framework contracting for essential medicines in Ghana. This included personnel from the Ministry of Health (Procurement Unit and Pharmaceutical Services Directorate), the Ghana Health Service Supply Chain Directorate, the National Health Insurance Authority, the Public Procurement Authority, the Food and Drugs Authority, pharmaceutical suppliers and importers, public health facilities, and development partners supporting pharmaceutical procurement. These institutions were selected because they play central roles in the planning, regulation, financing, implementation, procurement, supply chain management, and operational delivery of framework contracting within Ghana's health sector.

Consequently, participants were purposively selected from these key institutions based on their direct involvement and expertise in framework contracting, enabling the study to generate in-depth and credible evidence on the phenomenon under investigation.

Inclusion and Exclusion Criteria

Participants who held managerial, technical, regulatory, or operational roles within institutions involved in pharmaceutical procurement, regulation, financing, supply, or service delivery and directly involved in the design, implementation, monitoring, or coordination of framework contracting or essential medicines procurement were included in the study. Participants with a minimum of one year of experience in their current role were included to ensure adequate exposure to procurement and supply chain processes.

Administrative staff without decision-making, technical, or operational responsibilities related to framework contracting or medicine procurement and individuals who declined consent or were unavailable during the data collection period were excluded from the study.

Sampling Strategy

A purposive sampling technique was employed to recruit participants with direct knowledge and experience in pharmaceutical procurement, regulation, financing, supply chain management, and the implementation of framework contracting for essential medicines in Ghana. This approach was used to deliberately target information-rich participants capable of providing detailed insights. Initial participants were identified through institutional directories and official recommendations from relevant departments within the Ministry of Health and collaborating agencies. Subsequent participants were selected based on their direct involvement in framework contracting activities and their ability to provide rich, information-intensive perspectives. Of the 15 individuals invited to participate, ten consented; 5 declined or were unavailable during the data collection period. Recruitment and all interviews were conducted by AKO.

A total of ten participants were purposively selected from key stakeholder institutions including the Ministry of Health (Procurement Unit), the Ghana Health Service (Supply Chain Directorate), the National Health Insurance Authority, the Public Procurement Authority, the Food and Drugs Authority, pharmaceutical suppliers and importers, public health facilities, and development partners (Table 2). The sample size was determined by the size of the population holding direct national responsibility for framework contracting rather than by a predetermined target: the relevant expertise is concentrated in a small number of institutional positions, and the sample therefore approaches a census of the accessible expert population rather than a subset of a large one.

Table 2: Profile of Study Participants			
Participant	Gender and age group	Highest qualification	Stakeholder Role
Participant 1	Male, under 40	First degree	Central Medical Stores Representative
Participant 2	Female, 40–49	Advanced degree	Pharmaceutical Supplier/Manufacturer
Participant 3	Male, 50 and above	Advanced degree	Ministry of Health Representative
Participant 4	Male, under 40	First degree	Public Health Facility Pharmacist
Participant 5	Female, 40–49	Advanced degree	NHIA Representative
Participant 6	Male, 40–49	First degree	Regional Medical Store Representative
Participant 7	Female, under 40	First degree	Public Procurement Authority Representative
Participant 8	Male, 50 and above	Advanced degree	Ghana Health Service Supply Chain Officer
Participant 9	Female, 40–49	First degree	Food and Drugs Authority Representative
Participant 10	Male, 50 and above	Advanced degree	Development Partner Representative
Note: Gender and age are reported together as a single banded characteristic and exact ages are omitted, because most institutions are represented by a single participant and the combination of a named institutional role with gender and a single-year age would render several participants identifiable. Participant identifiers were assigned in an order that does not correspond to the sequence of recruitment or data collection and are used in the quotation attributions throughout the Results. First degree denotes a diploma or bachelor's qualification; advanced degree denotes a master's or doctoral qualification.			

Data Collection Tools and Procedures

Data were collected using a semi-structured, in-depth interview guide. The interview guide was developed based on the study objectives and literature review to ensure consistency while allowing flexibility for participants to provide detailed, context-specific responses. The draft guide was reviewed by two experts in qualitative health systems research and pharmaceutical policy to establish content validity. Minor revisions were made to improve clarity, sequencing, and relevance before the main data collection commenced. The guide was also piloted with one procurement professional who met the inclusion criteria but was not included in the final analysis.

Data were collected through in-depth interviews across all stakeholder groups using both face-to-face and virtual formats. Seven interviews were conducted face-to-face while three were conducted virtually via Microsoft Teams and WhatsApp video calls. Interviews lasted between 30 and 45 minutes, a duration constrained by the limited availability of senior officials; the interview guide was correspondingly focused on the two study questions rather than on the full breadth of participants' procurement experience. All interviews were conducted in English and audio-recorded with participants' written informed consent. In addition, field notes were taken during each interview to document non-verbal cues, contextual observations, and key reflections that supported later analysis.

Open-ended questions were used to encourage participants to express their views freely on procurement processes, implementation challenges, and supply chain dynamics. Probing questions were used strategically to clarify responses, explore contradictions, and obtain deeper explanations where necessary. The interactive nature of the technique allowed participants to offer examples and practical experiences relating to framework contracting implementation.

Data collection continued until successive interviews were yielding repetition of previously identified concepts rather than substantially new ones. Because the sample deliberately spanned eight distinct institutional groups, this judgement is more accurately described as saturation of the shared analytic categories that cut across stakeholder groups than as code saturation within any single group, and the latter should not be inferred from it [26, 27].

Document Review and Search Criteria

The documentary strand was assembled to establish the formal design of the arrangement and its recorded performance, against which participants' accounts could be compared. Documents were sought from four sources: the Ministry of Health website and the internal records of the Procurement and

Supply Chain Directorate and the Pharmacy Directorate; the Public Procurement Authority website, which carries the legislation and the standard tender documents under which framework tenders are advertised; the National Health Insurance Authority website, which publishes the medicines list against which framework contract prices are benchmarked; and the published and grey literature, searched through Google Scholar and the repositories of development partners supporting pharmaceutical procurement in Ghana. Search terms combined framework contract, framework agreement, framework contracting, and pooled or centralized procurement with Ghana, essential medicines, and medicines pricing.

Documents were eligible for inclusion if they were institutionally attributable to a government body, regulator, or development partner; if they bore directly on the legal basis, design, product scope, pricing, implementation, financing, or evaluation of framework contracting for essential medicines in Ghana or provided an international normative benchmark against which its design could be appraised; and if they were retrievable in full text. Documents were excluded if they addressed other medicines pricing instruments without reference to framework contracting, such as the value added tax exemption regulations; if they were superseded editions, drafts, or working versions of an included document; if they were secondary summaries of a document already included; or if they could not be obtained in full. Where an instrument had been revised, the edition in force during the period covered by the arrangement was used. Screening was conducted independently by two members of the research team and disagreements resolved by discussion.

Eleven documents met the criteria and are listed in Table 3. They comprise two pieces of legislation, four national policy or planning instruments, two normative product lists, two performance evaluations, and one item of international guidance. Each document was read in full and charted against a matrix with two axes: the design parameters set out in Table 1, and the reported performance of the arrangement in respect of price, lead time, supplier fulfilment, forecast accuracy, product availability, and payment. Charted material was then compared with the interview themes. The documentary record was treated as evidence of what the arrangement formally provides for and what has been officially recorded about it, not as an independent verification of participants' perceptions; where the two diverged, the divergence was itself treated as a finding.

Table 3
Documents included in the review (n = 11)

No.	Document	Type	Contribution to the analysis
1	Public Procurement Act, 2003 (Act 663)	Legislation	General legal framework and methods for public procurement
2	Public Procurement (Amendment) Act, 2016 (Act 914)	Legislation	Establishes framework agreements as a permitted procurement method
3	Health Commodity Supply Chain Master Plan [15]	Sector plan	Origin of the framework contracting recommendation and supply chain architecture
4	Justification for Number of Medicines to be Selected for Procurement under Costed Framework Contracting Agreement Project for Ghana [16]	Technical report	Basis and criteria for the product scope of the arrangement
5	Ghana National Medicines Policy, 3rd edition [28]	Policy	Policy objectives for access, pricing, procurement and local production
6	Ghana Essential Medicines List, 7th edition [29]	Normative list	Defines the universe of products eligible for public procurement
7	National Health Insurance Scheme Medicines List (NHIA, 2018)	Reimbursement list	Price interface between framework contract prices and NHIS tariffs
8	Framework Contracting Evaluation Report [30]	Evaluation report	Institutional assessment of the first implementation round
9	Holistic Assessment of the Health Sector Programme of Work [2]	Sector performance review	Sector-level medicine availability and supply chain indicators
10	Assessment of Framework Contract Implementation and Financial Sustainability in Ghana's Public Health Commodity Supply Chain [14]	Technical assessment	Price, lead time, supplier fill rate, stockout, forecast accuracy and indebtedness data
11	Manual for Framework Agreements [31]	Normative guidance	International benchmark against which the design of the Ghanaian arrangement was appraised

Data Analysis

Data were analysed using the six-phase thematic analysis framework developed by Braun and Clarke [32]. All audio-recorded interviews were transcribed verbatim and cross-checked against the original recordings to ensure accuracy, completeness, and consistency of the transcripts. The transcribed data were subsequently imported into NVivo 14 qualitative data analysis software to support systematic data organization, coding, management, and retrieval.

In the first phase, the research team read the transcripts repeatedly to become familiar with the dataset and to identify preliminary patterns and areas of significance. During the second phase, initial codes were generated inductively from participants' narratives. Codes were derived from the data themselves rather than from a pre-specified frame, and no theoretical construct was applied as a code at this stage. In the third phase, related codes were grouped together to develop preliminary themes representing recurring ideas and patterns within the data. The fourth phase involved reviewing and refining the identified themes by comparing them against the coded extracts and the entire dataset to ensure coherence, relevance, and consistency. In the fifth phase, themes were clearly defined, named, and organized to accurately represent participants' experiences and perspectives. Finally, the sixth phase involved developing the analytical narrative, where themes were interpreted and supported with representative quotations from participants to illustrate key findings.

The analysis was inductive throughout. Codes and themes were generated from participants' accounts rather than applied to them, and the study objectives served to organize the presentation of themes under the two research questions rather than to prescribe what could be coded. Transaction cost economics, institutional theory, and agency theory were introduced only after themes had been finalized and were used to frame and interpret them in the discussion. This sequence is stated explicitly because the distinction between a framework that generates categories and one that interprets them bears directly on how much independent support the data give to the theoretical claims made later. The identified codes were progressively grouped into broader categories and refined into themes and sub-themes that captured common patterns across stakeholder perspectives. The final themes were reviewed to ensure clear boundaries between categories and internal consistency within each theme. Coding was undertaken by AKO and independently reviewed by SAB, discrepancies in code definitions and theme boundaries were resolved through discussion and the codebook revised accordingly. Representative participant quotations were selected to support interpretation and enhance the credibility of the findings; quotations were chosen to illustrate both modal and divergent accounts rather than only those consistent with the emerging interpretation. Charted documentary material was analysed alongside the interview themes at the theme review stage and was used to establish whether the formal design of the arrangement and its recorded performance corroborated, qualified, or contradicted what participants described.

Quality Assurance

Trustworthiness was ensured using the criteria proposed by Lincoln and Guba [33]. Credibility was enhanced through probing and clarification during interviews, systematic comparison of accounts across stakeholder groups, methodological triangulation of interview accounts against the documentary record, and the use of verbatim quotations to support findings. Prolonged engagement in its conventional sense was not feasible within a single-interview design, and credibility is claimed based on the analytic breadth of the sample rather than on duration of contact. Dependability was strengthened by maintaining a clear audit trail documenting sampling decisions, interview procedures, coding, and theme development. Confirmability was promoted through reflexive note-taking and systematic documentation of analytical decisions to minimize researcher bias. Transferability was enhanced by providing detailed descriptions of the study setting, participant characteristics, and research procedures to enable readers to assess the applicability of the findings to similar contexts. Reporting was guided by the Consolidated Criteria for Reporting Qualitative Research [34], and a completed checklist is provided as a supplementary file.

Reflexivity and Positionality

The research team included members affiliated with institutions involved in the implementation of framework contracting, and this dual position carried both advantages and risks. Familiarity with procurement processes and existing professional relationships facilitated access to senior informants and supported informed probing. The same position, however, created the possibility that participants would present institutionally favourable accounts, particularly where they were describing a reform led by the Ministry of Health, and that the research team would interpret findings in ways sympathetic to the reform. Several steps were taken to mitigate this. Participants were informed at the outset that the study was conducted for research rather than performance monitoring purposes and that no institution or individual would be identified in any output. Interviews were conducted in a neutral setting or by video call rather than in supervisory contexts, and no participant was interviewed by a person exercising line authority over them. During analysis, accounts that were critical of framework contracting were deliberately sought out and retained, and divergent perspectives between procurement actors on one hand and suppliers and facility staff on the other were treated as substantive findings rather than as noise. Reflexive notes recording the research team's own assumptions about the reform were maintained throughout and revisited during theme development.

Results

The findings are reported in two parts. The first summarizes what the eleven reviewed documents establish about the design and recorded performance of the arrangement. The remaining sections report the themes generated inductively from interviews with stakeholders in institutions responsible for pharmaceutical policy development, procurement, regulation, financing, supply chain management, and service delivery. The findings highlight the experiences and perceptions regarding the factors influencing the adoption of framework contracting and its implementation processes. Quotations are attributed by stakeholder role and by the participant identifier used in Table 2. All ten participants are quoted directly.

Documentary Account of the Design and Recorded Performance of Framework Contracting

The reviewed documents establish framework contracting as a centralising instrument grafted onto a decentralised purchasing system, and they record a performance pattern that is directionally split. Ghana's public health sector purchases essential medicines through budget and management centres at regional and facility level, and the absence of any coordinating mechanism across them was the inefficiency the reform was designed to address [14, 15]. The instrument centralises price formation while leaving purchase obligation and payment with decentralised units, and its recorded performance follows that division closely: the procurement terms it controls directly, namely price and lead time, improved substantially, whereas the availability outcomes that depend on supplier fulfilment, forecasting and payment did not. The documentary evidence is summarised in Table 4, which reports what the documents record; the design parameters themselves are set out in Table 1 and are not repeated in the discussion below. Taken together it establishes, independently of participants' accounts, both the improvement in procurement terms that stakeholders described and the failure of that improvement to convert into reliable availability. What the documents do not explain is why the two diverge; that is the question the interview findings address. One qualification attaches to the price finding. Because the National Health Insurance Authority came to benchmark its own medicine tariffs on framework contract prices, the recorded fall in NHIS prices for framework products partly reflects the transmission of negotiated contract prices into the tariff schedule rather than an independent measure of what public purchasers paid. It is nonetheless informative that no comparable movement occurred for non-framework products over the same period, which is difficult to explain other than by the arrangement itself.

Table 4
Documentary findings on the design and recorded performance of framework contracting

Domain	What the documents record	Source
Origin and legal basis	Recommended in the Health Commodity Supply Chain Master Plan of 2012 and implemented from 2018 under Act 663 as amended by Act 914, which admits framework agreements as a procurement method.	[8, 9, 13, 15]
Stated objective and scope	Centralized bulk purchase of high-volume, high-value and high-supply-risk essential medicines at negotiated prices. Products selected and quantified by a technical working group spanning the Ministry, Ghana Health Service, Regional Medical Stores, teaching hospitals, NHIA and FDA.	[13, 16]
Locus of authority	Selection, tendering, evaluation and price negotiation conducted centrally over a cycle of approximately one year, with a memorandum of understanding signed at ministerial level. Supply contracts are executed, and call-offs placed and paid, by Regional Health Administrations, Regional Medical Stores and teaching hospitals from drug revolving funds replenished by NHIS reimbursement.	[13, 14]
Award and allocation	Multi-supplier: four responsive vendors appointed per product from the second round, with quantities divided in fixed proportions by price rank. Competition is settled at award and not reopened at call-off.	[13]
Price basis	Firm in Ghana cedis for the round, with no standard adjustment formula. Ad hoc upward revisions of 8 per cent in round one and 20 per cent in round two were negotiated after award in response to currency depreciation, inflation and interest rates.	[13]
Volume commitment	Allocated quantities are indicative rather than guaranteed; facilities were recorded as unable to call off the full quantities agreed.	[13]
Price outcome	Average NHIS price of framework products fell by approximately 35 per cent between 2016 and 2022, with no comparable reduction for non-framework products. The NHIA came to benchmark its own tariffs on framework contract prices.	[14]
Lead time outcome	Average supplier lead time fell from 188.4 days in the first round to 80.4 days by 2022.	[14]
Supplier fulfilment	Average fill rates below 50 per cent for 80 per cent of assessed Regional Medical Stores and teaching hospitals, with no correlation between fill rate and the number of products awarded. Vendors withheld supply from indebted facilities.	[13, 14]
Forecast accuracy	Mean absolute percentage error above 25 per cent for 70 per cent of framework commodities at Regional Medical Stores and 61 per cent at teaching hospitals.	[14]
Product availability	In 2022, stockouts of framework products were reported by 28.6 per cent of CHPS compounds, 37.2 per cent of health centers, 36.8 per cent of district hospitals and 29.6 per cent of regional hospitals.	[14]
Financing chain	Average NHIS indebtedness to health facilities rose from approximately GHS 1.24 million in 2017 to approximately GHS 3.07 million in 2022, with average receivable days of 270 for facilities and 376 for Regional Medical Stores. Facility and store obligations were judged largely dischargeable if the NHIA settled its own.	[14]
Departure from normative guidance	The design departs from the World Bank guidance chiefly in fixing prices without an indexation mechanism in an import-dependent market, and in appointing suppliers centrally while leaving the payment obligation with decentralized units.	

Factors Influencing the Adoption of Framework Contracting as a Procurement Reform for Essential Medicines

Participants explained that the introduction of framework contracting was influenced by weaknesses in previous pharmaceutical procurement arrangements, including fragmented purchasing systems, inconsistent pricing, supplier uncertainty, and unequal medicine availability across regions. Stakeholders generally viewed framework contracting as a response to these longstanding inefficiencies; however, some participants noted that the reform addressed procurement processes more effectively than downstream supply chain and financing challenges.

Inefficiencies in Previous Procurement System

Participants described the previous procurement environment as fragmented, with different institutions and facilities engaging suppliers independently. This fragmentation created variations in medicine prices, procurement timelines, and supplier responsiveness. A Ministry of Health procurement participant explained:

“Before framework contracting, procurement was not well coordinated. Different facilities had different arrangements, which affected pricing and consistency of supply.” (P3

Ministry of Health Representative)

Similarly, a pharmaceutical supplier indicated that fragmented procurement practices created uncertainty for suppliers:

“When demand was not consolidated, suppliers found it difficult to plan because orders were unpredictable and varied across facilities.” (P2: Pharmaceutical Supplier/Manufacturer)

These accounts suggest that framework contracting was introduced not only as a procurement mechanism but also as an attempt to create greater coordination between purchasers and suppliers. However, while policymakers emphasized efficiency gains, suppliers highlighted the importance of predictable demand and payment assurance as conditions necessary for the success of the reform.

Influence of Policy Reforms and Development Partners

Participants also identified national health sector reforms and development partner support as important influences behind the adoption of framework contracting. Development partners were perceived as providing technical assistance and encouraging procurement approaches aligned with international supply chain practices. A development partner representative stated:

"Framework contracting was consistent with broader health system strengthening efforts aimed at improving procurement efficiency and accountability." (P10

Development Partner Representative)

A Ministry of Health participant similarly noted:

"There was a need to move towards procurement approaches that improve transparency and reduce inefficiencies within the system." (P3

Ministry of Health Representative)

However, some participants cautioned that external influence alone was insufficient to guarantee successful implementation. They emphasized that sustainability depended on domestic financing, institutional commitment, and alignment with Ghana's health procurement structures.

Expected Efficiency and Equity Improvements

Participants indicated that framework contracting was expected to improve medicine availability through centralized planning, standardized pricing, and stronger supplier accountability. A Ghana Health Service supply chain officer explained:

"The expectation was that having agreements with suppliers would improve forecasting, reduce delays, and ensure facilities receive medicines more consistently." (P8

Ghana Health Service Supply Chain Officer)

A Central Medical Stores representative added:

"Framework contracting was expected to create better coordination and improve access, especially for facilities that previously struggled to obtain medicines." (P1: Central Medical Stores Representative)

Stakeholders therefore viewed framework contracting as a strategic reform directed at both efficiency and equity, although, as the sections below show, procurement improvements alone did not resolve the associated financing, logistics, and distribution challenges.

Institutional Implementation and Stakeholder Coordination

Participants described the implementation of framework contracting as a collaborative process involving multiple institutions with complementary responsibilities across the pharmaceutical procurement and supply chain. Although stakeholders generally acknowledged that clearly defined institutional roles had improved procurement governance and accountability, they also emphasized that the involvement of numerous actors introduced procedural complexities that affected implementation efficiency. The findings suggest that the effectiveness of framework contracting depends not only on the contractual arrangements themselves but also on the quality of coordination among procurement, regulatory, financing, logistics, and service delivery institutions.

Structured Multi-Stage Procurement Process

Participants described framework contracting as a structured procurement mechanism comprising several sequential stages, including needs assessment, forecasting, quantification, procurement planning, tendering, bid evaluation, contract award, issuance of call-off orders, supplier delivery, quality assurance, and distribution to health facilities. Most participants viewed this structured approach as an improvement on previous practice because it strengthened planning, standardized procedures, and clarified accountability along the supply chain. A Ministry of Health representative explained:

"Framework contracting follows a clearly defined process beginning with forecasting and quantification, followed by procurement planning, tendering, evaluation, contract award and call-off orders before medicines are supplied." (P3

Ministry of Health Representative)

Similarly, a Ghana Health Service Supply Chain Officer stated:

"The process allows institutions to estimate their medicine requirements in advance and procure from pre-qualified suppliers instead of initiating a completely new procurement process each time medicines are needed." (P8

Ghana Health Service Supply Chain Officer)

A representative from the Public Procurement Authority further noted:

"The framework arrangement provides consistency because procurement activities follow established procedures that comply with procurement regulations." (P7

Public Procurement Authority Representative)

These accounts indicate that stakeholders regarded framework contracting as introducing greater procedural discipline into pharmaceutical procurement. However, participants also observed that the numerous stages involved required effective coordination among institutions to prevent unnecessary delays. Consequently, although the procurement process was considered more systematic than previous approaches, its effectiveness depended heavily on efficient institutional collaboration.

Interdependence of Stakeholder Roles

Participants consistently emphasized that framework contracting operates through a network of institutions with distinct but interconnected responsibilities. The Ministry of Health was viewed as providing policy direction and procurement leadership, while the Public Procurement Authority ensured compliance with procurement regulations. The Food and Drugs Authority was responsible for medicine quality assurance, whereas the National Health Insurance Authority influenced financing and payment processes. Central and Regional Medical Stores coordinated warehousing and distribution, while suppliers and manufacturers were responsible for fulfilling contractual obligations. A Ministry of Health participant explained:

"Each institution has a specific responsibility. The Ministry coordinates procurement, FDA ensures medicine quality, PPA oversees compliance, NHIA supports financing, while suppliers deliver the medicines." (P3

Ministry of Health Representative)

Similarly, an FDA representative stated:

"Quality assurance remains our responsibility before medicines enter the supply chain. Without regulatory clearance, procurement alone cannot guarantee safe medicines." (P9: Food and Drugs Authority Representative)

A representative from the National Health Insurance Authority added:

"Although NHIA is not directly responsible for procurement, our reimbursement processes influence how quickly suppliers are eventually paid." (P5

NHIA Representative)

These accounts indicate that framework contracting functions as an integrated system rather than an isolated procurement mechanism. Participants repeatedly indicated that the performance of one institution directly influenced the effectiveness of others. Delays in financing, regulatory approval, procurement administration, or logistics therefore had consequences throughout the supply chain, ultimately affecting medicine availability at health facilities.

Coordination Challenges Across Institutions

Although participants generally viewed inter-institutional collaboration as a strength of framework contracting, they also described coordination challenges that limited implementation efficiency. Several participants explained that multiple approval levels, overlapping institutional responsibilities, and protracted communication chains often delayed procurement decisions and medicine distribution. A pharmaceutical supplier observed:

"Sometimes procurement itself is completed, but movement through the approval and payment processes takes much longer than expected." (P2

Pharmaceutical Supplier/Manufacturer)

Similarly, a Public Procurement Authority representative noted:

"Many procurement activities require approvals from several institutions, and delays at one stage affect the entire procurement cycle." (P7: Public Procurement Authority Representative)

A Regional Medical Store representative further explained:

"Coordination between procurement and distribution is not always synchronized. Medicines may be procured, but distribution schedules and storage arrangements sometimes delay delivery to facilities." (P6

Regional Medical Store Representative)

While most participants viewed these coordination challenges as significant barriers, some stakeholders argued that the complexity reflected necessary governance safeguards rather than administrative inefficiency. A Ministry of Health official explained:

"Some approval procedures may appear lengthy, but they are intended to ensure transparency, accountability and compliance with procurement regulations." (P3

Ministry of Health Representative)

This contrasting perspective suggests that stakeholders differed in how they interpreted procedural complexity. Procurement officials generally viewed multiple approval stages as mechanisms for ensuring accountability, whereas suppliers and service delivery actors perceived them primarily as contributors to procurement delays. These differing perspectives illustrate the inherent tension between maintaining regulatory oversight and achieving timely medicine procurement.

Institutional Coordination as a Determinant of Medicine Availability

Beyond describing procurement procedures, participants consistently linked institutional coordination directly to medicine availability. They explained that framework contracting could only achieve its intended objectives when procurement planning, financing, supplier performance, regulatory approval, warehousing, and distribution functioned in a coordinated manner.

A hospital pharmacist stated:

"Medicine availability depends on how well all institutions work together. Delays at any point eventually affect patients because medicines arrive later than expected."

(P4

Public Health Facility Pharmacist)

Similarly, a development partner representative explained:

"Framework contracting provides the procurement structure, but medicine availability depends on coordination across the entire pharmaceutical supply chain." (P10

Development Partner Representative)

These findings indicate that participants viewed medicine availability as the product of an interconnected health system rather than procurement arrangements alone. While framework contracting established mechanisms for improving procurement efficiency, its overall effectiveness was perceived to depend on strong institutional collaboration, effective communication, timely financing, and coordinated logistics. Consequently, procurement reforms alone were considered insufficient unless supported by broader health system strengthening initiatives.

Discussion

Factors Influencing the Adoption of Framework Contracting as a Procurement Reform for Essential Medicines

The adoption of framework contracting in Ghana was shaped by three interconnected factors: weaknesses in previous procurement arrangements, institutional pressure for procurement modernisation, and an expectation that coordinated purchasing would improve medicine availability. Participants described the pre-reform environment as fragmented, with multiple purchasing arrangements, inconsistent supplier engagement, price variation, and uneven distribution across facilities. Read through transaction cost economics, these are the conditions under which organisations abandon repeated spot exchange for longer-term governance: existing arrangements were generating high search, negotiation and coordination costs and sustained uncertainty for purchasers and suppliers alike [20]. Framework contracting can therefore be interpreted as an attempt to reduce that uncertainty through longer-term supplier relationships, standardised purchasing, and greater price predictability. The documentary record supports this reading of intent and, in part, of effect: contract prices fell by approximately 35 per cent between 2016 and 2022 and lead times more than halved between the first and third rounds [14]. The theory is used here to interpret why the shift was made and what it achieved; the themes themselves were generated inductively.

This is consistent with earlier Ghanaian evidence that weak procurement planning, financing and supply coordination contribute to shortages [35], but the present study extends it. Participants did not treat procurement fragmentation as an isolated technical problem. They linked it to financing uncertainty, supplier risk, institutional coordination and distribution limits, and therefore to the broader health system environment in which procurement sits. On this reading, the move to framework contracting was not only a change of purchasing procedure but an attempt to restructure relationships among the actors in pharmaceutical supply management.

External actors and international policy norms also shaped adoption. Participants identified development partners and international procurement practice as encouraging reform directed at transparency, efficiency and accountability, which accords with institutional theory's account of how models diffuse through coercive, normative and mimetic pressure [21, 23]. Comparable dynamics are documented in Ghana in the institutionalisation of health technology assessment and in the RTS,S malaria vaccine introduction, where partner support accelerated adoption but outcomes depended on domestic mandate, capacity and actor positioning [17, 36]. External influence should not, however, be read as simple transfer. Participants held that sustainability depended on domestic financing, regulatory capacity, supplier markets and implementation structures, which is consistent with evidence that Ghanaian health reforms are shaped by the interaction of external and domestic institutional processes [37], and that pooled procurement requires national ownership and governance to be sustained [38]. Externally supported procurement reform therefore requires contextual adaptation rather than replication.

The third factor was expectation. Participants believed that agreements with pre-qualified suppliers would strengthen purchasing power, improve price consistency and reduce the delay of repeated tendering, an expectation supported by evidence that framework agreements lower transaction costs and consolidate demand [11, 39] and by Tanzanian experience of improved planning and cost control [40]. The assumption embedded in it, that procurement efficiency would translate directly into availability, was not borne out. What counted as success also differed by position: procurement and regulatory stakeholders emphasised governance, standardisation and compliance, whereas suppliers and facility staff emphasised payment reliability, delivery timelines, and whether medicines were actually present at the point of care. A system can therefore be judged successful administratively, because contracts

are awarded transparently at standardised prices, while facilities still experience shortages because suppliers face financial uncertainty or distribution barriers. Procurement performance indicators alone are not an adequate measure of reform effectiveness.

The study therefore suggests that framework contracting operates as a conditional reform rather than an independent solution to availability. Existing literature emphasises the economic and governance advantages of framework agreements [11, 39]; this study extends it by specifying the pathway. Framework contracting improves procurement coordination and predictability, which in turn influences supplier confidence and planning, but the conversion of those gains into availability is moderated by payment reliability, distribution capacity and institutional coordination. Where those supporting systems are weak, procurement improvement does not produce consistent access. Framework contracting remains a substantial improvement on fragmented arrangements, but its effectiveness depends on alignment between procurement governance, financing, supplier relationships, logistics and accountability mechanisms.

Experiences and Perceptions of the Implementation of Framework Contracting within the Ministry of Health Pharmaceutical Procurement System

Stakeholders perceived implementation as a structured but complex institutional process. Framework contracting introduced greater organisation, standardisation and predictability, yet the same arrangements designed to secure transparency and accountability generated operational delay where coordination was weak. It is thus simultaneously a governance improvement and an operational burden, reflecting the tension between accountability and responsiveness in public procurement. Institutional theory frames this well: performance is shaped by formal rules, institutional relationships and shared expectations [23], and the involvement of the Ministry, the Public Procurement Authority, the Food and Drugs Authority, the Ghana Health Service, the medical stores, suppliers and financing agencies shows that pharmaceutical procurement operates through a network rather than a single organisation. Participants recognised that multiple actors improved oversight while fragmenting responsibility, particularly where communication, approvals and financial decisions were not synchronised. This extends a procurement literature that has assessed reform largely by compliance, cost and efficiency, by showing that implementation performance also depends on relational factors: trust between institutions, information exchange, responsiveness and shared accountability.

The structured process was identified as a major strength. Participants described a sequence running from forecasting and quantification through tendering, evaluation, award and call-off to delivery, quality assurance and distribution, and regarded it as an improvement on previous practice because it encouraged advance planning and removed repeated procurement. This supports evidence that framework agreements reduce duplication and create more predictable purchasing [11, 39, 40], but procedural standardization alone did not guarantee availability. Procurement and regulatory actors read multiple approval stages as safeguards against corruption, poor decisions and misuse of public resources; suppliers and service delivery actors read the same stages as sources of delay. This is the governance dilemma of public procurement, in which mechanisms that promote accountability reduce operational flexibility, and may require deliberate balance because excessive administrative requirement raises transaction costs. The trade-off matters more for medicines than for most categories, because delay translates directly into absence at the point of care.

Transaction cost economics also illuminates an unintended effect. Framework contracting was introduced partly to reduce the costs of repeated supplier selection and price negotiation, and it did so; but participants described new coordination costs arising in their place, in multiple approval requirements, inter-institutional communication delay and extended payment procedures [20]. Procurement reform should therefore be assessed not only by whether it simplifies procedure, but by whether the resulting governance arrangement improves system responsiveness overall.

Stakeholder interdependence was a major finding. Participants consistently described availability as the outcome of interaction among procurement, regulation, financing, warehousing, transport and service delivery, consistent with a health systems perspective in which outcomes emerge from interacting components rather than isolated interventions. Medicines could be contracted, approved, and still be unavailable if payment was delayed, transport inefficient, or distribution poorly coordinated. The pattern parallels COVID-19 vaccine deployment in Ghana, where analytically sound decisions were not fully realised at the point of delivery because financing, logistics and coordination intervened between the decision and the patient [41, 42]. What this study adds is that the same discontinuity occurs in routine essential medicines procurement, and not only under emergency conditions. This is consistent with evidence that access depends on multiple system functions [43] and that universal access requires sustainable system structures rather than procurement mechanisms alone [44].

The two strands of evidence converge on the central finding and diverge on its explanation, and the divergence is itself informative. Participants and documents agree that procurement terms improved and that availability did not follow: the price and lead time gains recorded in Table 4 are the gains stakeholders described, and the persisting stockouts, weak fill rates and accumulated indebtedness are the constraints they identified. Where the two differ is in attribution. The documentary record locates the problem in execution, recommending better forecasting, stronger vendor performance criteria and prompter reimbursement, all of which treat the design as sound and its implementation as deficient. Participants described a set of pressures that follow from the design itself: firm prices without indexation, indicative volumes, and a separation between the authority that negotiates the contract and the units that must pay for it. Taken together, this suggests that the arrangement is not underperforming despite its design but partly because of it, and that remedies confined to implementation will have limited reach.

Perceptions of effectiveness were not unified but varied with institutional position. Procurement and regulatory institutions evaluated the reform by procedural improvement, compliance, transparency and supplier accountability; suppliers emphasised financial predictability and payment security; facilities asked only whether medicines were present when required. This is consistent with wider Ghanaian evidence that the financing pathway, and the timeliness of National Health Insurance Scheme reimbursement, determines whether a procurement or coverage decision is realized in practice [45, 46]. For suppliers the question was not whether a contract existed but whether it was backed by reliable payment, which is an agency problem: performance depends on the alignment of interests and incentives between principal and agent [24]. Read against Table 1, the observed supplier behaviour is what the design predicts. Prices are firm in Ghana cedis for a round of roughly a year in an import-dependent market with no standard adjustment formula; allocated volumes are indicative; and the obligation to pay rests with Regional Medical Stores, teaching hospitals and facilities drawing on drug revolving funds replenished by NHIS

reimbursement, not with the Ministry that negotiated the price. A supplier carrying unhedgeable currency risk on a firm-price contract, facing uncertain call-off from a counterparty whose liquidity depends on a third party's reimbursement cycle, has three rational responses: price a risk premium at bid, ration allocation towards higher-certainty buyers, or decline to bid again. The documentary record shows all three, in the ad hoc upward revisions of 8 and 20 per cent obtained after award, in fill rates below 50 per cent for 80 per cent of assessed stores and teaching hospitals with no correlation to volume awarded, and in supply withheld from indebted facilities [13, 14]. Suppliers are therefore better understood as strategic actors responding to the incentive structure they face than as external contractors failing to honour obligations. An alternative explanation should be considered and can be partly excluded. If underperformance reflected supplier capacity rather than incentives, fill rates would be expected to fall as the volume awarded to a vendor rose, since larger allocations would strain capacity first. The assessment found no such relationship, which is consistent with rationing by expected payment rather than with capacity constraint [14]. Forecast error, by contrast, is a genuine competing explanation for stockouts and cannot be separated from payment risk on the present evidence; both operate on the same commodities in the same period.

Coordination emerged as both strength and weakness. Multiple institutions improved accountability and produced a more comprehensive procurement structure while reducing implementation efficiency, and recognising this duality is itself a contribution, since research has tended to treat coordination as either solution or problem. Institutional fragmentation is a recognised constraint on health reform in low- and middle-income countries [47], and governance and coordination are established conditions for successful pooled procurement [38]. The present study qualifies this: the difficulty in Ghana is not the number of actors but the absence of sufficiently integrated mechanisms for communication, decision-making and accountability among them. Reducing the number of stakeholders would not necessarily improve performance; strengthening the mechanisms that connect them might.

Implementation is therefore better understood as institutional adaptation than as the application of a procurement model. The reform has established stronger procurement structures, but its effectiveness depends on how institutions interpret their roles, coordinate action and respond to emerging supply problems. What it indicates is that successful implementation requires alignment among institutional mandates, financing systems, supplier relationships, regulatory processes and supply chain capacity, and that the challenge in Ghana is not implementing framework contracting but building the surrounding capacity to convert procurement gains into reliable availability.

Limitations

Several limitations should be borne in mind when interpreting these findings. First, the study drew on ten participants distributed across eight institutional groups, which means that most stakeholder categories are represented by a single informant. Individual accounts cannot be triangulated against others occupying the same position, and institutional perspectives should be read as the view of one strategically placed actor rather than as a settled organisational position. Second, although the study combined interviews with a review of eleven documents, the documentary strand comprised legal instruments, policy documents, evaluations and published analyses rather than transaction-level records. Individual framework agreements, tender evaluation reports, call-off orders and payment records were not obtained, so the account of design given in Table 1 rests on documented descriptions of the arrangement rather than on inspection of the contracts themselves and reported performance figures are those of the assessments cited rather than independently verified. Third, the documentary evidence on performance is drawn from assessments commissioned or conducted by organisations involved in supporting the reform, which may shape what was measured and how it was framed, and no independent evaluation of the arrangement was available. Fourth, the single-interview design with interviews of 30 to 45 minutes limited the depth of exploration possible on any single issue and precluded prolonged engagement or repeat interviewing. Fifth, findings were not returned to participants for member checking, so the interpretation reflects the research team's reading of the accounts rather than a jointly validated one. Sixth, several members of the research team are affiliated with institutions involved in implementing the reform, which may have shaped both what participants were willing to say and how their accounts were interpreted, notwithstanding the mitigation steps described in the Reflexivity and Positionality section. Seventh, the study captured perceptions at a single point in time and cannot establish whether framework contracting has in fact changed prices, lead times, or medicine availability; such claims would require analysis of procurement and stock data over time. Finally, the findings relate to national-level framework contracting for essential medicines in Ghana and are not intended to be generalised statistically to other commodity categories, subnational procurement, or other countries, although the analytic propositions developed may be transferable to comparable settings.

Conclusion

Framework contracting was adopted not simply to improve procurement efficiency but as a response to governance, coordination and supply chain weaknesses in Ghana's pharmaceutical system, and stakeholders regard it as having improved purchasing coordination, supplier relationships and accountability. The documentary record confirms that it delivered the price and lead time gains it was designed to deliver, while availability at the point of care did not correspondingly improve; the interview accounts locate the reason in features of the contract design rather than in implementation effort alone. Framework contracting is therefore better understood as a health system intervention than as a procurement mechanism, and reforms of this kind require adaptation to local financing, regulatory and supply chain realities rather than replication of an international model.

The Government of Ghana, through the Ministry of Finance and the relevant health sector agencies, should establish sustainable financing for medicines procured under these arrangements. The Public Procurement Authority and the Ministry of Health should shorten approval pathways without weakening accountability, and should revisit the design parameters themselves: a transparent price adjustment mechanism tied to a published index or exchange rate band in place of firm cedi pricing; call-off allocation linked to measured delivery performance; published indicative volumes with a minimum offtake commitment where forecasting permits; and enforceable payment terms with defined remedies, since payment reliability was the condition on which supplier behaviour most closely depended. Future research should test these relationships longitudinally, combining interrupted time series analysis of price and stock-out data with analysis of framework agreement and call-off records, and should consider applying structured deliberative appraisal to decisions about which medicines enter the arrangement [46, 48].

Abbreviations

CMS: Central Medical Stores

CHPS: Community-based Health Planning and Services

COREQ: Consolidated Criteria for Reporting Qualitative Research

EDCTP: European and Developing Countries Clinical Trials Partnership

EML: Essential Medicines List

FDA: Ghana Food and Drugs Authority

GHSC-PSM: Global Health Supply Chain Program - Procurement and Supply Management

GHC: Ghana cedi (currency)

GHS: Ghana Health Service

HTA: Health Technology Assessment

LMICs: Lower- and Middle-Income Countries

NHIA: National Health Insurance Authority

NHIS: National Health Insurance Scheme

RMS: Regional Medical Stores

RHA: Regional Health Administration

SAVING: Sustainable Access and Delivery of New Vaccines in Ghana

STG: Standard Treatment Guidelines

FWC: Framework Contract

MoH: Ministry of Health

OECD: Organization for Economic Cooperation and Development

PPA: Public Procurement Authority

SDGs: Sustainable Development Goals

UHC: Universal Health Coverage

WHO: World Health Organization

Declarations

Ethics approval:

The study was conducted according to the ethical principles outlined in the Declaration of Helsinki and adhered to all relevant research ethics guidelines and regulations. Ethical approval was obtained from the Ghana Health Service Ethics Review Committee (GHS-ERC) under approval number GHS-ERC: 064/05/24. Participation was voluntary and written informed consent was obtained from every participant before the interview, following a verbal and written explanation of the purpose of the study, the intended use of the data, and the right to withdraw at any point without consequence. Participants were assured that neither they nor their institutions would be identified in any output. Audio recordings and transcripts were stored on password-protected devices accessible only to the research team, identifiers were removed at the point of transcription, and participants are referred to throughout by role rather than by name or position title.

Clinical Trial Number:

Not applicable

Consent to participate:

Written informed consent was obtained from all participants prior to participation in the study.

Consent for publication:

Not applicable

Availability of data and materials:

The interview guide and the final coding framework are provided as supplementary files. Full interview transcripts are not publicly available because participants occupy uniquely identifiable institutional positions and their release would compromise the confidentiality assured at consent. De-identified data extracts are available from the corresponding author on reasonable request.

Competing interests:

The authors declare that they have no competing financial interests. Several authors are affiliated with institutions involved in the implementation of framework contracting for essential medicines in Ghana; this affiliation is disclosed in the interests of transparency and the steps taken to mitigate its influence on the conduct and interpretation of the study are described in the Reflexivity and Positionality section.

Funding:

Resources for the conduct of this research were provided by the EDCTP SAVING Consortium. The funder had no role in the design of the study, in data collection, analysis, or interpretation, or in the decision to submit the work for publication. No funding was received for the preparation or publication of this article. The work was undertaken under EDCTP project grant number CSA2018HS-2528, implemented by the SAVING Consortium in Ghana.

Authors' contributions:

SAKO, BAA, SAB conceptualized the study and developed the study design. AKO and SAB developed the interview guide and AKO led data collection. AKO and SAB conducted the coding and thematic analysis. SAKO, BAA, DDO developed the version of the manuscript. EA, TO, OO, AH, SAB and MG provided scientific leadership. MAD, MA, MU, SKY reviewed the draft manuscript. Members of the SAVING Consortium provided inputs to the design of the study. All authors read and approved the final manuscript.

Acknowledgements:

This study was made possible through funding from the European and Developing Countries Clinical Trials Partnership (EDCTP) through the SAVING Consortium. The authors thank the Access and Delivery Partnership (ADP) for the roles it has played in this work, and are grateful to the stakeholders across the Ministry of Health, the Ghana Health Service, the National Health Insurance Authority, the Public Procurement Authority, the Food and Drugs Authority, the Central and Regional Medical Stores, pharmaceutical suppliers, health facilities, and development partner institutions who gave their time to be interviewed.

Author information

1. Sarah Ama Kafui Okine, Ministry of Health, Accra, Ghana / SAVING Consortium.

Email: sarah.okine@moh.gov.gh

2. Brian Adu Asare, HTA Secretariat, Ministry of Health, Accra, Ghana / SAVING Consortium.

Email: basare100@gmail.com

3. Desmond Dzidzornu Otoo, Health Technology Assessment Technical Working Group, Accra, Ghana.

Email: ddotoo@st.ug.edu.gh

4. Saviour Yevutsey, Ministry of Health, Ghana / SAVING Consortium, Ho, Ghana.

Email: syevutsey@yahoo.com

5. Maxwell Ayindenaba Dalaba, University of Health and Allied Sciences / SAVING Consortium, Ho, Ghana.

Email: mdalaba@uhas.edu.gh

6. Mustapha Immurana, University of Health and Allied Sciences / SAVING Consortium, Ho, Ghana.

Email: mimmurana@uhas.edu.gh

7. Matilda Aberese-Ako, University of Health and Allied Sciences / SAVING Consortium, Ho, Ghana.

Email: maberese-ako@uhas.edu.gh

8. Evelyn Ansah, University of Health and Allied Sciences / SAVING Consortium, Ho, Ghana.

Email: eansah@uhas.edu.gh

9. Tuoyo Okorosobo, SAVING Consortium, Ho, Ghana.

Email: okorosobot@gmail.com

10. Olumide Ogundahunsi, SAVING Consortium, Ho, Ghana.

Email: ogundahunsi@gmail.com

11. Abraham Hodgson, SAVING Consortium, Ho, Ghana.

Email: abrahamhodgson@hotmail.com

12. Serwaa Akoto Bawuah, School of Public Health, University of Ghana, Accra, Ghana.

Email: abiward2010@gmail.com

13. Margaret Gyapong, University of Health and Allied Sciences / SAVING Consortium, Ho, Ghana.

Email: mgyapong@uhas.edu.gh

Members of the SAVING Consortium

Acquah, Evelyn; Addo, Iverta Naa Dedei; Alhassan, Robert Kaba; Amankwa, Belynda; Anumu, Fidelis; Appiah, Rhoda Ewurabena; Asamoah-Amoakohene, Abena; Ashie, Adela; Auer, Christian; Bosch-Capblanch, Xavier; Doegah, Phidelia Theresa; Ewudzie, Jeremiah Sampson; Gavor, Edith Enyonam; Gyansa-Lutterodt, Martha; Klu, Desmond; Odopey, Christopher Tetteh; Sabblah, George Tsey; Seaneke, Seth Kwaku; Tsey, Irene Honam; Vidzro, Saviour Edem; Wyss, Kaspar.

References

1. WHO. Tracking universal health coverage: 2017 global monitoring report [Internet]. Geneva. 2017 [cited 2026 Aug 6]. Available from: <https://www.who.int/publications/i/item/9789241513555>
2. Ministry of Health. Holistic assessment of the health sector programme of work 2019. Accra; 2020.
3. Boateng R, Renner L, Petricca K, Gupta S, Denburg A. Health system determinants of access to essential medicines for children with cancer in Ghana. *BMJ Glob Health*. 2020;5(9):e002906.
4. Seiter A. A practical approach to pharmaceutical policy. World Bank; 2010.
5. Yadav P. Health product supply chains in developing countries: diagnosis of the root causes of underperformance and an agenda for reform. *Health Syst Reform*. 2015;1(2):142–54.
6. Sinclair D, Gyansa-Lutterodt M, Asare B, Koduah A, Andrews E, Garner P. Integrating Global and National Knowledge to Select Medicines for Children: The Ghana National Drugs Programme. *PLoS Med*. 2013;10(5):e1001449.
7. Koduah A, Asare BA, Gavor E, Gyansa-Lutterodt M, Andrews Annan E, Ofei FW. Use of evidence and negotiation in the review of national standard treatment guidelines and essential medicines list: experience from Ghana. *Health Policy Plan*. 2019;34(Supplement2):ii104–20.
8. Act 663. Public Procurement Act (Act 663). Act 663 Ghana; 2003.
9. Act 914. Public Procurement (Amendment) Act (Act 914). Act 914 Ghana; 2016.
10. Lal S. Guidebook for Setting up and Operating Framework Agreements. The World Bank; 2021.
11. Albano GL, Sparro M. Flexible strategies for centralized public procurement. *Rev Econ Institutions*. 2010;1(2).
12. Siyal S, Xin C. Public procurement. *Global Encyclopedia of Public Administration, Public Policy, and Governance* Cham. Springer Int Publishing. 2020;1–8.
13. Koduah A, Baatiema L, Kretchy IA, Agyepong IA, Danso-Appiah A, de Chavez AC, et al. Implementation of medicines pricing policies in Ghana: the interplay of policy content, actors' participation, and context. *Int J Health Policy Manag*. 2023;12:7994.
14. USAID. Global Health Supply Chain Program [Internet]. 2024 [cited 2026 Aug 8]. Available from: <https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.ghsupplychain.org/&ved=2ahUKewic3MneqJCWaxW0UkEAHUheNLOQFnoECBkQAQ&usg=AOv>
15. Ministry of Health. Health commodity supply chain master plan [Internet]. Accra. 2012 [cited 2026 Aug 8]. Available from: <https://www.moh.gov.gh/wp-content/uploads/2022/06/Ghana-Final-Final.pdf>

16. Ministry of Health. Justification for number of medicines to be selected for procurement under costed framework contracting agreement project for Ghana. Accra; 2017.
17. Koduah A, Anim Boadi J, Azeez JNK, Adu Asare B, Yevutsey S, Gyansa-Lutterodt M, et al. Institutionalizing health technology assessment in Ghana: enablers, constraints, and lessons. *Health Syst Reform*. 2023;9(3):2314519.
18. Owusu R, Asare BA, Aryeetey GC, Amankwah I, Abassah-Konadu E, Gulbi G, et al. Standards for the conduct and reporting of health technology assessments: Ghana reference case of HTA and economic evaluations. *Int J Technol Assess Health Care*. 2025;41(1):e17.
19. Williamson OE. Transaction-cost economics: The governance of contractual relations. *J Law Econ*. 1979;22(2):233–61.
20. Williamson OE. Transaction cost economics. *Handb industrial Organ*. 1989;1:135–82.
21. DiMaggio PJ, Powell WW. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *Am Sociol Rev*. 1983;48(2):147–60.
22. North DC. Institutions, ideology, and economic performance. *Cato J*. 1991;11:477.
23. Scott WR. *Institutions and organizations* (2nd [thoroughly rev. and expanded] ed). Thousand Oaks, CA[etc]: Sage; 2001.
24. Jensen MC, Meckling WH. Theory of the firm: Managerial behavior, agency costs and ownership structure. *J financ econ* [Internet]. 1976;3(4):305–60. Available from: <https://www.sciencedirect.com/science/article/pii/0304405X7690026X>
25. Yin R. *Case study research: Design and methods* (5th ed.). 5th Edition. Thousand Oaks, CA: Sage; 2014.
26. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field methods*. 2006;18(1):59–82.
27. Saunders B, Sim J, Kingstone T, Baker S, Waterfield J, Bartlam B, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant*. 2018;52(4):1893–907.
28. Ministry of Health. Ghana national medicines policy (3rd ed.). Accra; 2017.
29. GNDP. Ghana essential medicines list (7th ed. Accra; 2017).
30. Ministry of Health. Framework contracting evaluation report. Accra; 2019.
31. World Bank. Guidebook for Setting-up and Operating Framework Agreements [Internet], Washington DC. 2021 [cited 2026 Aug 8]. Available from: <https://documents1.worldbank.org/curated/en/958921624026529503/pdf/Guidebook-for-Setting-up-and-Operating-Framework-Agreements.pdf>
32. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77–101.
33. Lincoln YS, Guba EG. *Naturalistic inquiry*. Beverly Hills, CA: Sage; 1985.
34. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007;19(6):349–57.
35. Atiga O, Walters J, Pisa N. Challenges of medical commodity availability in public and private health care facilities in the Upper East Region of Ghana: a patient-centered perspective. *BMC Health Serv Res*. 2023;23(1):719.
36. Bosch-Capblanch X, Wyss K, Asare B, Auer C, Ansah E, Ogundahunsi O et al. Mapping stakeholders' positioning in the access and delivery partnership value chain: the case of the RTS,S malaria vaccine introduction in Ghana. *Int J Public Health* [Internet]. 2026;Volume 71-2026. Available from: <https://www.ssph-journal.org/journals/international-journal-of-public-health/articles/10.3389/ijph.2026.1609524>
37. Mills A, Ally M, Goudge J, Gyapong J, Mtei G. Progress towards universal coverage: the health systems of Ghana, South Africa and Tanzania. *Health Policy Plan*. 2012;27(suppl1):i4–12.
38. Parmaksiz K, Pisani E, Bal R, Kok MO. A systematic review of pooled procurement of medicines and vaccines: identifying elements of success. *Global Health*. 2022;18(1):59.
39. OECD. Framework Agreements [Internet]. 2011 [cited 2026 Aug 8]. Available from: https://www.oecd.org/content/dam/oecd/en/publications/reports/2011/09/framework-agreements_g17a25f5/5js4vmnmnhf7-en.pdf
40. Mboma WL, Assessment On Effects Of Procurement Process Through The Use Of Gpsa Framework Agreement On Public Entities In Tanzania. A Case Study Of National Auditing Office (NAO). *Asian J Manage Entrepreneurship Social Sci*. 2022;2(02):164–84.
41. Nonvignon J, Owusu R, Asare B, Adjagba A, Aun YW, Yeung KHT, et al. Estimating the cost of COVID-19 vaccine deployment and introduction in Ghana using the CVIC tool. *Vaccine*. 2022;40(12):1879–87.
42. Asare BA, Abassah-Konadu E, Okine SAK, Amankwah I, Otoo DD, Asante H, et al. Barriers to the application of Health Technology Assessment (HTA) results: the case of COVID-19 vaccine deployment in Ghana. *Int J Technol Assess Health Care*. 2026;42(1):e17.
43. WHO. Access to medicines: making market forces serve the poor [Internet]. 2017 [cited 2026 Aug 8]. Available from: <https://cdn.who.int/media/docs/default-source/essential-medicines/fair-price/chapter-medicines.pdf?sfvrsn=adcf8f4&download=true>
44. Wirtz VJ, Hogerzeil HV, Gray AL, Bigdeli M, De Joncheere CP, Ewen MA, et al. Essential medicines for universal health coverage. *Lancet*. 2017;389(10067):403–76.
45. Owusu R, Heupink LF, Gulbi G, Asare B, Amankwah I, Abassah-Konadu E, et al. Achieving universal coverage of childhood cancers in Ghana via the national health insurance scheme: a stakeholder analysis. *PLOS Global Public Health*. 2025;5(7):e0004871.
46. Owusu R, Pritchard D, Heupink LF, Gulbi G, Asare B, Amankwah I, et al. Cost-effectiveness and budget impact of covering Burkitt lymphoma in children under Ghana's National Health Insurance Scheme. *Cost Eff Resource Allocation*. 2025;23(1):1.
47. Ahsan KZ, Streatfield PK, Ijdi RE, Escudero GM, Khan AW, Reza MM. Fifteen years of sector-wide approach (SWAp) in Bangladesh health sector: an assessment of progress. *Health Policy Plan*. 2016;31(5):612–23.

48. Surgey G, Asare BA, Baltussen R. Health technology assessment in Ghana: the development of the process guidelines using evidence-informed deliberative processes. *Cost Effectiveness and Resource Allocation* [Internet]. 2026;24(1):40. Available from: <https://doi.org/10.1186/s12962-025-00703-y>