

COMPARATIVE ANALYSIS OF DRUG COSTS BASED ON THE ACTIVITY-BASED COSTING METHOD AND DRUG PRICE RATES, INCLUDING THE EVALUATION OF COST DIFFERENCES AND MANAGERIAL IMPLICATIONS IN THE PHARMACY UNIT OF MARTHA FRISKA MULTATULI HOSPITAL

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Abstract

This study aims to analyze the difference between drug Unit Cost calculated using Activity-Based Costing (ABC) and Traditional Unit Cost, and to evaluate its implications for actual margin and tariff policy in the Pharmacy Unit of Martha Friska Multatuli Hospital. A quantitative approach with a descriptive-comparative design was applied. The data were secondary data for the year 2025, comprising drug purchasing records, sales records, selling prices, transaction volume, receipt frequency, and the indirect costs of the pharmacy unit. The sample consisted of 100 drug items with the highest sales volume and complete data, selected through purposive sampling. The results show that the mean ABC Unit Cost was IDR 1,427.62, while the mean Traditional Unit Cost was IDR 1,249.08. The Jarque-Bera normality test indicated that the cost-difference data were not normally distributed, so the Wilcoxon Signed-Rank Test was used and revealed a significant difference between ABC Unit Cost and Traditional Unit Cost ($p < 0.001$), with a large effect size ($r = 0.868$). All sampled drugs were undercosted under the traditional system. Tariff evaluation using a 20% target margin showed that 79 drugs exhibited a positive tariff deviation and 21 drugs exhibited a negative tariff deviation relative to the ABC-based proposed tariff. These findings indicate that ABC strengthens pharmacy cost information, supports the evaluation of actual margins, and provides a basis for prioritizing drug-tariff review. The managerial implications include strengthening the hospital's Unit Cost Team, improving the recording of pharmacy activities, integrating pharmacy data systems, and conducting periodic tariff evaluation based on activity costs and actual margins.

Keywords: Activity-Based Costing, Traditional Unit Cost, ABC Unit Cost, Undercosting, Actual Margin, Tariff Deviation, Managerial Implications.

INTRODUCTION

Pharmacy services represent one of the most important components of hospital care because they are directly connected to patients' therapeutic needs, the safety of drug use, and the continuity of clinical services. The pharmacy unit does not merely function as a drug supplier; it also plays a role in cost management, inventory control, and hospital operational efficiency. The literature shows that hospital pharmacy services can contribute to lowering drug costs, strengthening clinical interventions, and reducing medication errors (Vanderlee et al., 2023). Pharmaceutical expenditure is also recognized as a major component of health financing because medicines absorb substantial resources in hospital operations (Morgan & Xiang, 2022). Field observation shows that hospital drug selling prices do not always reflect the actual costs consumed in pharmacy services. Price differences for the same type or classification of drug can occur across health facilities, and mismatches between hospital tariffs and reimbursement values under financing schemes such as BPJS can create cost inefficiency (Anggriani et al., 2020). This condition indicates the need for more detailed cost information as a basis for evaluating the fairness of drug selling prices. From a management-accounting perspective, accurate cost information is essential to support decision-making, particularly in service pricing. Traditional costing systems tend to allocate indirect costs uniformly and do not fully trace the activities that consume resources, so the resulting cost information may not adequately reflect actual resource consumption (Quesado & Silva, 2021). Activity-Based Costing (ABC) was developed to address this

weakness by tracing costs to the activities that cause them to arise; in the healthcare context, ABC is considered capable of generating more detailed and relevant cost information than the traditional approach (Niñerola et al., 2021). The pharmacy unit has characteristics that differ from other hospital service units. It involves many types of drugs, varying purchase prices, a high frequency of transactions, and diverse activities ranging from procurement, storage, and recording to dispensing and the maintenance of supporting facilities. Each of these activities consumes resources such as labor, storage facilities, electricity, office supplies, equipment, and maintenance. Cost evaluation in the pharmacy unit therefore requires an approach capable of describing direct and indirect costs in a more structured manner.

In this study, the term "drug cost based on the Activity-Based Costing method" is operationalized as the calculation of unit cost. Based on academic input regarding the comparability of the objects being compared, statistical testing was directed at comparing ABC Unit Cost with Traditional Unit Cost, so that the comparison is made on a cost-to-cost basis. The drug selling price, or the hospital's actual tariff, was not used as the primary object of the difference test; instead, it was used to evaluate margin, positive tariff deviation, negative tariff deviation, and the managerial implications for drug-tariff setting. Prior studies show that ABC and Time-Driven Activity-Based Costing (TDABC) have been widely applied in the health sector to calculate hospital service costs. Popesko et al. (2015) applied ABC to analyze the cost and reimbursement of several hospital diagnoses, while Papadaki et al. (2015) compared patient costs based on ABC with traditional costing and hospital reimbursement. Etges et al. (2020) further showed that TDABC is widely used in healthcare services to support value-based healthcare through the provision of more detailed cost information.

However, most prior studies have focused on inpatient services, patient diagnoses, medical procedures, diagnostic services, or general patient management. Studies that specifically compare ABC Unit Cost with Traditional Unit Cost in a pharmacy unit, and link this comparison to the evaluation of margin and drug selling prices per drug item, remain limited. This is despite the fact that the pharmacy unit has its own complexity, involving variation in drug type, purchase price, transaction volume, and indirect costs that are not always easily traceable to each drug item. This research gap is further reflected in the scarcity of studies that not only calculate activity-based unit cost, but also compare it with traditional unit cost, evaluate actual margin, identify positive and negative tariff deviations, determine priority drugs based on the largest deviation, analyze the economic value of tariff deviation, and formulate managerial implications. Xu et al. (2021) explain that cost measurement in healthcare services requires detailed data on resource utilization and unit costs so that cost estimation becomes more accurate. This indicates that the evaluation of unit cost and drug selling price needs to be developed not only to produce cost figures, but also to support managerial tariff decision-making.

The urgency of this study is further supported by empirical conditions at the Pharmacy Unit of Martha Friska Multatuli Hospital. Preliminary interviews with pharmacy and finance staff indicate that drug pricing has not been fully supported by a unit-cost calculation that is documented in detail based on pharmacy service activities. In practice, drug pricing still considers the purchase price, internal hospital policy, margin, and market or comparative prices from other health facilities. This condition indicates that internal cost information needs to be strengthened so that drug selling prices better reflect the resources consumed in the pharmacy unit. This study is not intended to compare the drug tariffs of Martha Friska Multatuli Hospital with those of other hospitals. Information regarding the consideration of market or comparative prices is used only as an initial illustration that drug tariff setting is not yet fully based on detailed internal cost calculation. Inter-hospital comparison would require data on cost structure, tariff policy, hospital class, service volume, procurement systems, and each hospital's operational characteristics. Accordingly, this study is limited to an internal evaluation, namely assessing the alignment between the prevailing drug selling price and the activity-based proposed tariff at the Pharmacy Unit of Martha Friska Multatuli Hospital.

The research gap in this study therefore lies in the object of analysis and the depth of the analysis. This study does not merely apply an Activity-Based Costing approach based on several cost pools in the pharmacy unit; it also compares ABC Unit Cost with Traditional Unit Cost per drug item. The selling price is then analyzed to assess actual margin, positive and negative tariff deviation, to determine priority drugs, to analyze the economic value of tariff deviation, to perform margin sensitivity analysis, and to formulate managerial implications for Martha Friska Multatuli Hospital. Based on the background above, this study addresses the following research questions: (1) What is the result of the ABC Unit Cost calculation using an Activity-Based Costing approach based on several cost pools at the Pharmacy Unit of Martha Friska Multatuli Hospital? (2) Is there a difference between ABC Unit Cost and Traditional Unit Cost for the drugs analyzed? (3) What are the actual margin and the tariff-policy deviation between the hospital's actual selling price and the ABC-based proposed tariff, in the form of positive and negative tariff

deviation? (4) What are the characteristics of drugs experiencing the largest tariff-policy deviation? (5) What are the managerial implications of the tariff-deviation evaluation for drug pricing and the operational efficiency of the pharmacy unit? Correspondingly, this study aims to: (1) calculate and analyze ABC Unit Cost using an Activity-Based Costing approach based on several cost pools; (2) evaluate the difference between ABC Unit Cost and Traditional Unit Cost; (3) analyze actual margin and identify positive and negative tariff deviation; (4) identify priority drugs with the largest margin and tariff deviation; and (5) formulate managerial implications as a basis for drug-tariff setting and for improving the operational efficiency of the pharmacy unit. Theoretically, this study contributes to the management-accounting literature on cost evaluation and tariff setting in the hospital sector by extending the application of a multiple-cost-pool Activity-Based Costing approach to the pharmacy unit, with the drug item as the unit of analysis, and by comparing it with Traditional Unit Cost. Practically, the findings are expected to provide input for the management of Martha Friska Multatuli Hospital in evaluating unit cost and drug selling price, identifying drugs with positive and negative tariff deviation, evaluating margin, determining priority drugs for review, and strengthening the basis for tariff decision-making. The findings may also encourage the hospital to develop a more detailed pharmacy activity-recording system so that future cost calculations can be performed more accurately and on a stronger resource-consumption basis.

This study focuses on the evaluation of drug cost at the Pharmacy Unit of Martha Friska Multatuli Hospital. ABC Unit Cost is calculated using a multiple-cost-pool Activity-Based Costing approach and compared with Traditional Unit Cost, while the actual selling price is used to analyze margin and tariff-policy deviation, identify priority drugs, and formulate managerial implications. The study is limited as follows: (1) it covers only the Pharmacy Unit of Martha Friska Multatuli Hospital; (2) the data used are limited to drug purchasing, receiving, and sales data, selling prices, and indirect pharmacy-unit costs for the year 2025; (3) the study does not compare the hospital's drug tariffs with those of other hospitals, as the focus is on internal cost evaluation; (4) the approach applied is a multiple-cost-pool ABC adjusted to the availability of hospital operational data, rather than a full ABC with multiple activity drivers; (5) indirect costs are allocated using a unit-level activity driver, namely the number of drug items sold, because detailed per-drug activity data are not yet fully available; and (6) the resulting implications are managerial in nature, based on the evaluation of ABC Unit Cost, Traditional Unit Cost, margin, and tariff-policy deviation.

LITERATURE REVIEW

a) Management Accounting Theory

Management accounting serves as the conceptual foundation for this study because it is directly concerned with providing cost information to management. Cost information is required to support planning, control, evaluation, and decision-making; within an organization, management accounting functions not only as a recording tool but also as an internal information system that helps management understand cost structure and formulate more rational policy (Kwenda & Harrison, 2025). Wang (2025) explains that management accounting focuses on providing relevant internal information to assess performance, control costs, and support strategic decision-making.

In management accounting, cost information is used not merely to record expenditure but also to trace, classify, and assign costs to cost objects in a rational manner, a process known as cost assignment. For cost assignment to be accurate, costs need to be linked to the activities that cause them through the concepts of cost pool and cost driver (Leusder et al., 2022). A cost pool is a grouping of costs arising from a particular activity, while a cost driver is the basis used to assign that cost to the cost object—in this study, the drug item. Indirect pharmacy-unit costs need to be assigned using an appropriate basis so that they can be calculated as ABC Unit Cost and compared with Traditional Unit Cost (Etges et al., 2024).

Within the hospital context, management accounting plays an important role because hospitals must be able to provide quality health services while maintaining cost efficiency. Kludacz-Alessandri (2020) explains that hospitals require an accurate cost-information system to support rational, resource-based service pricing, since tariffs that are not grounded in adequate cost information can create a mismatch between the price set and the cost actually consumed in service delivery. Management accounting also supports the organization's financial sustainability through more structured cost management; Li (2024) notes that a sound cost-accounting system helps organizations allocate resources more precisely and identify opportunities to improve efficiency, and an activity-based approach such as ABC is relevant for improving the accuracy of cost information. In addition, management accounting strengthens transparency and accountability in financial management, as detailed cost information can serve as a basis for performance evaluation and more objective decision-making (Fuzi et al., 2022).

b) Cost Efficiency Theory

Cost efficiency theory explains the importance of managing resources appropriately so that an organization can produce optimal output at a rational cost. Cost efficiency does not simply mean minimizing cost, but ensuring that the cost incurred is proportional to the benefit and value generated for the organization (Lulaj, 2025). Seto et al. (2025) note that cost efficiency can be achieved through controlling the activities that consume resources and through using appropriate cost measures, while Moghaddasi et al. (2025) explain that reducing non-value-adding activities helps organizations improve the effectiveness of resource use.

In service organizations such as hospitals, cost efficiency is particularly important because health services involve complex activities and require substantial resources. In the pharmacy unit, activities such as procurement, storage, distribution, dispensing, recording, and facility maintenance require costs that must be managed appropriately, so hospitals need a cost-information system capable of describing resource consumption at each activity (Umpleby et al., 2026). Cost efficiency theory is also related to rational tariff setting: a tariff that is not supported by adequate cost calculation can create a mismatch between the selling price and the cost consumed. In this study, cost evaluation is first performed by comparing ABC Unit Cost and Traditional Unit Cost; the selling price is then used to assess margin as well as positive or negative tariff deviation, both of which must be evaluated because they can affect tariff fairness, operational efficiency, and the sustainability of pharmacy-unit management.

c) Activity-Based Costing

Activity-Based Costing is a cost-accounting method that assigns costs based on the activities that consume resources. It was developed in response to the weaknesses of traditional costing systems, which tend to assign indirect costs uniformly on a volume basis; Mahesha (2022) explains that such traditional systems can produce less accurate cost information because they do not fully account for the activities that cause costs to arise. Conceptually, ABC positions activity as the primary cause of cost, so costs must be traced through activities and cost drivers that reflect resource consumption. Setyaning and Fara Dita (2020) explain that the basic principle of ABC consists of two main stages: identifying activities and cost pools, and then assigning activity costs to products or services based on the level of activity consumption.

Within hospital services, ABC can be used to calculate service costs in a more structured manner because hospital activities involve extensive resources. In the pharmacy unit, cost-generating activities include drug procurement, storage, dispensing, transaction recording, inventory management, distribution, and facility maintenance. Rahmawati and Daengs GS (2021) note that cost drivers in an ABC system reflect the real activities that consume resources. In ABC, the cost driver is the basis for cost assignment, while the rate obtained by dividing total activity cost by the number of drivers is referred to as the cost-driver rate.

Ideally, a full Activity-Based Costing implementation requires detailed activity identification, the formation of cost pools, and the use of several activity drivers appropriate to the characteristics of each activity. In the pharmacy unit, activities that could ideally be separated include procurement, storage, dispensing, administration, distribution, and facility maintenance, each of which may have a different cost-assignment basis, such as prescription frequency, service time, storage type, transaction volume, or facility-usage intensity (Niñerola et al., 2021). This differentiation can also be explained through the concept of cost hierarchy, which distinguishes unit-level, batch-level, product-sustaining, and facility-sustaining activities, indicating that activity consumption can differ across drug items and that cost assignment would ideally use more than one activity driver.

However, a full ABC implementation requires complete and systematically documented activity data. In healthcare practice, activity-based costing methods often face challenges because they require detailed data such as resource-utilization time, service pathways, and the activities occurring during the service process; when such activity data are not yet fully available, a simplified approach can be used as an initial evaluation tool (Leusder et al., 2022). Given these constraints, this study applies a multiple-cost-pool Activity-Based Costing approach. This approach retains the basic ABC principle of assigning costs based on activities that consume resources, but assigns indirect costs using several activity drivers corresponding to the pharmacy unit's main activities, primarily the number of drug items sold, as this basis is consistently available from purchase price, selling price, quantity sold, and indirect-cost data (Keel et al., 2017).

The use of several activity drivers based on the pharmacy unit's main activities has both benefits and limitations. Its benefit is that cost calculation can be performed in a measurable way and used as an initial basis for drug-tariff evaluation. Its limitation is that this approach does not yet fully differentiate the activity consumption of each drug type; oral drugs, injections, infusions, narcotics, drugs requiring special storage, and supporting pharmaceutical materials may have different activity requirements, but in this study they still receive indirect-cost

assignment on the same basis. This limitation is directly relevant to the cost and tariff analysis: the cost comparison in this study is performed between ABC Unit Cost and Traditional Unit Cost so that the analysis remains on a like-for-like, cost-to-cost basis, while the selling price is used to assess margin, positive tariff deviation, and negative tariff deviation. Because this study applies a multiple-cost-pool ABC rather than a full ABC, the classification of tariff deviation should not be interpreted as a final judgement that a drug price is right or wrong; rather, it should be understood as an initial signal for management to evaluate tariff fairness, review drugs with the largest tariff-policy deviation, and improve the pharmacy activity-recording system in subsequent periods.

d) Traditional Unit Cost and Drug Selling Price

Traditional Unit Cost in this study is understood as the drug cost calculated from the average purchase price per item. This measure serves as a cost-based comparator to ABC Unit Cost because both are cost measures; accordingly, the statistical test in this study is not conducted between cost and selling price, but between two cost measures, namely ABC Unit Cost and Traditional Unit Cost.

The drug selling price is the actual tariff applied at the hospital and serves as the basis for pharmacy-service transactions with patients. In the hospital context, the selling price functions not only as a sale value but is also related to operational sustainability, cost control, margin policy, and patient affordability. Robinson et al. (2024) explain that healthcare tariffs play an important role in maintaining the sustainability of service providers and supporting resource allocation. Conceptually, pricing can be related to cost-based pricing, in which price is set as cost plus a target margin; this approach is relevant in the hospital context because the tariff set needs to be able to cover operational costs and support service sustainability (Špacírová et al., 2026). However, a tariff determined solely from purchase price and a general margin can create a mismatch if indirect costs have not been adequately accounted for.

Drug pricing in hospitals is influenced by various factors, including purchase price, storage cost, distribution cost, labor cost, administrative cost, inventory risk, regulation, internal policy, financing benchmarks, and patient-affordability considerations. Yang et al. (2025) explain that hospitals require a cost-accounting system capable of providing detailed cost information so that tariff setting can be performed more precisely. In practice, drug pricing must also balance the hospital's financial sustainability with the affordability of services for patients: a tariff that is too high can burden patients, while a tariff that is too low may fail to reach the intended cost-and-margin model. Accordingly, the selling price in this study is evaluated through margin analysis and tariff deviation based on internal cost information, rather than being used as the primary comparator in the statistical difference test.

e) Cost Variance (Tariff-Policy Deviation)

Tariff-policy deviation is the difference between the hospital's drug selling price and the ABC-based proposed tariff (Tarif Usulan ABC) derived from the multiple-cost-pool ABC approach. This analysis is conducted as a follow-up step after the cost comparison between ABC Unit Cost and Traditional Unit Cost, and shows whether the selling price is above, below, or equal to the ABC-based proposed tariff, which already incorporates the target margin. A positive result indicates a positive tariff deviation, while a negative result indicates a negative tariff deviation. The terms overcosting and undercosting, used in the initial conceptualization of this study, are retained only as transitional terms; in the tariff comparison, their operational meaning corresponds to positive and negative tariff deviation.

Tariff-policy deviation can arise from several factors, such as differences in costing method, inaccuracies in indirect-cost allocation, changes in drug purchase price, changes in operational cost, margin policy, and limitations in activity data (Huang & Cheng-Tsung, 2025). In the pharmacy unit, such deviation can emerge when drug pricing is not yet fully supported by detailed internal cost calculation; traditional methods tend to produce cost distortion because indirect costs are not always allocated based on actual activity consumption (Mahesha, 2022), which is why an activity-based approach is needed to provide more structured cost information.

Analysis of tariff-policy deviation is intended not only to identify the direction of the difference between the actual tariff and the ABC-based proposed tariff, but also to provide managerial information. Drugs experiencing positive tariff deviation need to be evaluated from the standpoint of tariff fairness and margin policy, while drugs experiencing negative tariff deviation need to be evaluated from the standpoint of the risk that the actual tariff has not yet reached the ABC-based proposed tariff and target margin, particularly if such drugs have high sales volume or are frequently used in patient care. This analysis further supports operational efficiency: by identifying drugs with the largest tariff-policy deviation, management can determine priorities for tariff evaluation and improve the cost-recording system (Dolcini et al., 2025). Accordingly, in this study, tariff-policy deviation is used as the basis for assessing margin and the deviation between the actual tariff/selling price and the ABC-based proposed tariff, and,

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ultimately, as the basis for formulating managerial implications for the Pharmacy Unit of Martha Friska Multatuli Hospital.

METHOD

A. Research Design

This study employs a quantitative approach with a descriptive-comparative design. The quantitative approach is applied because the research data are numerical, comprising drug purchase price, drug selling price, quantity of drugs sold, indirect pharmacy-unit cost, Traditional Unit Cost, ABC Unit Cost, the ABC-based proposed tariff, margin, and tariff-policy deviation. These data were analyzed to assess the difference between ABC Unit Cost and Traditional Unit Cost under a multiple-cost-pool Activity-Based Costing approach, and to evaluate the drug selling price through margin and tariff-deviation analysis. The descriptive component describes the process of calculating ABC Unit Cost using a simplified ABC approach at the Pharmacy Unit of Martha Friska Multatuli Hospital, while the comparative component addresses the comparison of two cost measures—ABC Unit Cost and Traditional Unit Cost—for the same object. The design is cross-sectional, using data from a single observation period, namely the year 2025, with the drug item as the unit of analysis.

B. Operational Definition of Analysis Components

The components analyzed in this study consist of ABC Unit Cost, Traditional Unit Cost, the drug selling price/actual hospital tariff, actual margin, the ABC-based proposed tariff, and tariff-policy deviation (positive and negative). ABC Unit Cost is the drug cost calculated by taking into account the average drug purchase price and the indirect pharmacy-unit cost allocated through a unit-level activity driver. The calculation proceeds in four stages: (1) computing the average purchase price of each drug from purchasing data; (2) determining the cost driver used, namely the number of drug items sold; (3) computing the indirect-cost allocation rate per item by dividing total indirect pharmacy-unit cost by the total number of items sold; and (4) computing ABC Unit Cost and the ABC-based proposed tariff by adding a 20% margin, determined through interviews with hospital management, to ABC Unit Cost.

The formulas applied are as follows: Indirect-Cost Allocation Rate per Item = Total Indirect Pharmacy-Unit Cost ÷ Total Number of Drug Items Sold; Traditional Unit Cost = Average Drug Purchase Price; ABC Unit Cost = Average Drug Purchase Price + Indirect-Cost Allocation Rate per Item; ABC-Based Proposed Tariff = ABC Unit Cost × 1.20.

Table 1. Identification of Activities, Cost Pools, and Drivers in the Simplified ABC Approach

No	Pharmacy Activity	Cost Pool	Ideal Driver	Driver Used
1	Drug procurement	Administration of procurement and receipt recording	Number of orders / purchase frequency	Frequency of drug receipt/purchase
2	Drug storage	Facility, utility, and storage maintenance	Storage type, space volume, storage duration	Number of items sold (facility proxy)
3	Dispensing / prescription service	Pharmacy service labor	Number of prescriptions and service time	Number of items sold
4	Administration and recording	Transaction and document recording	Number of transaction/receipt documents	Receipt frequency and number of items sold
5	Facility maintenance	Pharmacy facility maintenance	Area/facility used	Number of items sold (proxy)

Source: Processed by the researcher based on pharmacy-unit data and management interviews, 2026.

C. Population, Sample, and Sampling Technique

The population of this study comprised all drug records at the Pharmacy Unit of Martha Friska Multatuli Hospital for the year 2025, totaling approximately 4,000 drug items with available selling prices used in pharmacy services. Using purposive sampling, 100 drug items with the highest sales volume and complete data were selected. Drugs with the highest sales volume were prioritized because they are the most commonly used in pharmacy services and are therefore more representative for analyzing unit cost, margin, selling price, and tariff-policy deviation.

Sampled drugs were additionally required to (1) have complete cost data for calculating both Traditional Unit Cost and ABC Unit Cost, (2) have available selling-price data, (3) belong to the group with the highest sales frequency during the study period, and (4) remain actively used in pharmacy services. Any drug within the top-selling group lacking complete purchase, sales, price, or cost data was excluded and replaced by the next-ranked drug meeting the criteria.

D. Research Instruments and Data Collection

The instruments used were secondary-data documentation (pharmacy cost reports, cost-driver details, drug purchasing and sales data, and price lists) and a calculation recapitulation sheet used to compute costs under the multiple-cost-pool ABC method, compare them with Traditional Unit Cost, and analyze margin and tariff deviation. Because no questionnaire was used, validity and reliability testing were not applicable; data quality was instead ensured through completeness, consistency, and accuracy checks against official hospital records. Data collected included the indirect cost components of the pharmacy unit (employee salaries, equipment depreciation, staff training, office supplies, utilities, and maintenance), drug receiving, purchasing, and sales data, purchase prices, and prevailing selling prices, as well as interview and observation data used to support the determination of the cost driver, the 20% margin, and the managerial interpretation of the ABC-based proposed tariff. Data collection followed four steps: identifying data requirements related to activity cost, unit cost, margin, and selling price; collecting documents from the financial and administrative records of the pharmacy unit; classifying data according to the ABC calculation components; and processing the data using EViews software for descriptive analysis, normality testing, and the difference test between ABC Unit Cost and Traditional Unit Cost.

a) Data Analysis Technique

Data were processed using EViews and SPSS to calculate Traditional Unit Cost, ABC Unit Cost, and the ABC-based proposed tariff; to compare ABC Unit Cost with Traditional Unit Cost; and to analyze margin and tariff-policy deviation based on the prevailing selling price.

b) Descriptive Statistics

Descriptive statistics (minimum, maximum, mean, and standard deviation) were used to characterize ABC Unit Cost, Traditional Unit Cost, drug selling price, actual margin, and tariff-policy deviation, following Sugiyono (2019).

c) Normality Test

Normality was tested using the Jarque-Bera test in EViews, which is based on skewness and kurtosis (Kim, 2021), focusing on the paired difference between ABC Unit Cost and Traditional Unit Cost for the same drug. Data were considered normally distributed if the probability value exceeded 0.05. The Jarque-Bera statistic is $JB = (n/6)[S^2 + (K - 3)^2/4]$, where JB is the Jarque-Bera value, n is the sample size, S is skewness, and K is kurtosis.

d) Difference Test and Hypothesis Test

Because the two cost measures are paired observations on the same drug, the difference test used a Paired-Sample t-Test if the difference data were normally distributed, or the Wilcoxon Signed-Rank Test (Ghozali, 2018; Schober & Vetter, 2020) if the difference data were not normally distributed. The hypotheses tested at the 5% significance level were: H_0 = there is no significant difference between ABC Unit Cost and Traditional Unit Cost for the drugs analyzed at the Pharmacy Unit of Martha Friska Multatuli Hospital; H_1 = there is a significant difference between the two. H_0 is accepted if the significance value is greater than 0.05, and H_1 is accepted if it is smaller than 0.05.

e) Effect Size

The Wilcoxon effect size was computed to determine the practical strength of the difference between ABC Unit Cost and Traditional Unit Cost, using $r = Z/\sqrt{N}$, where Z is the Wilcoxon test statistic and N is the number of observations. An effect size of approximately 0.10 indicates a small effect, 0.30 a medium effect, and 0.50 or above a large effect (Cohen, 1988).

f) Margin and Tariff-Deviation Analysis

After ABC Unit Cost, Traditional Unit Cost, and the ABC-based proposed tariff were obtained, actual margin was computed as Selling Price – ABC Unit Cost, and tariff-policy deviation was computed as Selling Price – ABC-Based Proposed Tariff. A positive result classifies the drug as experiencing positive tariff deviation (selling price above the ABC-based proposed tariff); a negative result classifies it as experiencing negative tariff deviation (selling price below the ABC-based proposed tariff); a value of zero indicates that the selling price equals the ABC-based proposed tariff. This analysis further identified drugs with the largest deviation, computed the volume-based economic value of tariff deviation, and supported the formulation of managerial implications for drug-tariff evaluation.

RESULTS AND DISCUSSION

A. Results

This section presents the results of data processing based on secondary data from the Pharmacy Unit of Martha Friska Multatuli Hospital for the year 2025. The unit of analysis is 100 drug items with the highest sales volume and complete purchasing, sales, price, transaction-volume, and indirect-cost data. A key methodological refinement in this study is that the statistical difference test compares ABC Unit Cost with Traditional Unit Cost—a cost-to-cost comparison rather than comparing the selling price (a pricing decision) with the ABC-based cost measure, which would not be conceptually equivalent. The selling price is retained in the analysis, but is used in the managerial evaluation of actual margin and tariff deviation relative to the ABC-based proposed tariff, rather than as the primary pair in the statistical test.

a) Cost Pools, Activity Drivers, and Indirect-Cost Allocation Rates

Indirect pharmacy-unit costs were grouped into three cost pools reflecting the main activity clusters of the unit: procurement/administration, service/dispensing, and facility/storage.

Table 2. Cost Pools and Driver Rates for Indirect Pharmacy-Unit Costs, 2025

Cost Pool	Cost Component	Annual Cost (IDR)	Driver	Total Driver	Driver Rate (IDR)
Procurement/Administration	Office supplies + staff training	106,000,000	Receipt/purchase frequency (line items)	9,754.0	10,867.34
Service/Dispensing	Staff salaries	821,322,473	Number of items sold	6,112,420.50	134.37
Facility/Storage	Depreciation + utilities + maintenance	224,000,000	Number of items sold	6,112,420.50	36.65
Total	Total indirect cost	1,151,322,473	-	-	-

Source: Results of data processing, 2026.

Total indirect pharmacy-unit cost for 2025 amounted to IDR 1,151,322,473. The service/dispensing pool is the largest component, reflecting employee salaries of IDR 821,322,473 allocated at IDR 134.37 per item sold. The procurement/administration pool was allocated at IDR 10,867.34 per receipt/purchase frequency, and the facility/storage pool at IDR 36.65 per item sold (using item volume as a proxy in the absence of detailed storage-area and dwell-time data). Because activity consumption is not uniform across drugs—items with higher receipt frequency draw more administrative activity, while high-volume items draw more dispensing activity—the resulting ABC unit cost, unlike the traditional purchase-price-only measure, carries an explicit link to the activities that generate it.

Table 3. Summary of Activity-Cost Components per Unit

Activity Component	Driver	Mean (IDR)	Minimum (IDR)	Maximum (IDR)
Procurement/administration	Receipt/purchase frequency	7.53	1.82	21.74

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Service/dispensing	Number of items sold	134.37	134.37	134.37
Facility/storage	Number of items sold (proxy)	36.65	36.65	36.65
Total activity cost per unit	Combined drivers	178.55	172.84	192.76

Source: Results of data processing, 2026.

The procurement component is the only one that varies across drugs (mean IDR 7.53, range IDR 1.82–IDR 21.74), reflecting differing receipt frequencies relative to sales volume, while the dispensing and facility components are constant per item because they share the same driver. Combined, the average activity cost added to each drug is IDR 178.55, which is the principal reason ABC Unit Cost exceeds Traditional Unit Cost: purchase price alone captures acquisition cost but not the downstream pharmacy activities—receiving, storage, dispensing, recording, and facility upkeep that continue to consume resources after the drug is purchased.

b) Main Data of the Analysis Components

Table 4. Summary of Key Research Data

Component	Value	Note
Number of drug observations	100	Drugs with complete data
Total quantity sold	3,583,350.50	Sample sales volume, 2025
Mean selling price per unit	IDR 4,401.29	Basis for actual-margin evaluation
Mean Traditional Unit Cost	IDR 1,249.08	Based on average purchase price
Mean ABC Unit Cost	IDR 1,427.62	After activity-cost assignment
Mean difference, ABC – Traditional	IDR 178.55	Added activity cost
Mean ABC-based proposed tariff (20% margin)	IDR 1,713.15	ABC Unit Cost + target margin
Mean actual margin	178.71%	Selling price vs. ABC Unit Cost
Positive tariff deviation	79 drugs	Selling price above proposed tariff
Negative tariff deviation	21 drugs	Selling price below proposed tariff

Source: Results of data processing, 2026.

The mean selling price (IDR 4,401.29) is well above the mean ABC Unit Cost, but this should not be read as evidence that every drug is safely priced: the median selling price is only IDR 1,495.19, far below the mean, indicating that a small number of high-priced drugs pull the average upward while many drugs remain in a low selling-price range. The tariff-deviation classification shows that 79 drugs sit above the ABC-based proposed tariff and 21 sit below it; the latter group warrants attention because it may compress actual margin and impede recovery of pharmacy activity costs.

c) Descriptive Statistics

Table 5. Descriptive Statistics of ABC Unit Cost and Traditional Unit Cost (n = 100)

Statistic	ABC Unit Cost (IDR)	Traditional Unit Cost (IDR)
Mean	1,427.622	1,249.075
Median	6.436.745	4.678.454
Maximum	12,790.16	12,605.60
Minimum	2.350.969	6.069.000
Std. Dev.	2,024.215	2,022.454
Skewness	3.108.828	3.110.296
Kurtosis	1.416.885	1.417.951
Jarque-Bera	6.808.438	6.819.887
Probability	0.000000	0.000000

Source: Results of data processing, EViews output, 2026.

The mean ABC Unit Cost (IDR 1,427.622) exceeds the mean Traditional Unit Cost (IDR 1,249.075), consistent with ABC's explicit inclusion of pharmacy activity cost. Both variables show large gaps between mean

and median, high positive skewness (~3.11), and high kurtosis (~14.2–14.18), indicating a small subset of high-cost drugs (injections, infusions, and other high-value items) pulling the distribution to the right—typical of pharmaceutical cost data given the heterogeneity of dosage forms in the sample.

Table 6. Descriptive Statistics of the Difference between ABC Unit Cost and Traditional Unit Cost

Statistic	ABC – Traditional (IDR)
Mean	1.785.467
Median	1.773.074
Maximum	1.927.589
Minimum	1.728.360
Std. Dev.	44.975
Jarque-Bera	3.006.040
Probability	0.000000

Source: Results of data processing, 2026.

The paired difference is positive for every drug (mean IDR 178.5467, range IDR 172.8360–IDR 192.7589), confirming that ABC assigns additional activity cost to all 100 sampled drugs. The relatively small standard deviation of the difference (IDR 4.4975) compared with the standard deviation of unit cost itself indicates that most of the overall cost variation still comes from the purchase price, while the incremental activity-cost component is comparatively stable—though the small item-to-item variation that does exist, driven mainly by differing procurement frequency, remains managerially relevant.

d) Normality Test

Table 7. Jarque-Bera Normality Test

Variable	Jarque-Bera	Probability	Conclusion
ABC Unit Cost	6.808.438	0.000000	Not normally distributed
Traditional Unit Cost	6.819.887	0.000000	Not normally distributed
Difference, ABC – Traditional	3.006.040	0.000000	Not normally distributed

Source: Results of data processing, 2026.

All three probability values are below 0.05, so the null hypothesis of normality is rejected in every case. This non-normality is economically plausible: drug cost data are not generated by a single homogeneous product but by many drug types with differing prices and dosage forms—mostly lower-priced tablets and capsules alongside a smaller number of much higher-priced infusions, vials, and ampoules—a structure that typically produces right-skewed, non-normal distributions. Consequently, the Wilcoxon Signed-Rank Test, rather than the paired-sample t-test, was used for hypothesis testing.

e) Hypothesis Test

The Wilcoxon Signed-Rank Test was used to test H1: there is a significant difference between drug Unit Cost based on the Activity-Based Costing method and drug Unit Cost based on the hospital's traditional method. Beyond significance, the test's negative and positive ranks indicate the direction of the difference: a preponderance of negative ranks (Traditional Unit Cost < ABC Unit Cost) indicates undercosting in the traditional system, while the reverse would indicate overcosting.

Table 8. Wilcoxon Signed-Rank Test – Ranks

Category	N	Mean Rank	Sum of Ranks	Interpretation
Negative ranks (Traditional < ABC)	100	50.50	5,050.00	All observations show ABC higher
Positive ranks (Traditional > ABC)	0	0.00	0.00	No drug shows overcosting
Ties (Traditional = ABC)	0	-	-	No equal values
Total	100	-	-	Total observations

Table 9. Wilcoxon Signed-Rank Test Statistics

Statistic	Value
Total N	100
Test Statistic	0.000
Standard Error	290.839
Standardized Test Statistic (Z)	-8.682
Asymptotic Significance (2-sided)	< 0.001

Source: Results of data processing, 2026.

All 100 paired observations fall in the "Traditional < ABC" category, with no ties and no reversed pairs. The asymptotic two-sided significance is below 0.001, which is well under the 0.05 threshold, so H1 is accepted: there is a statistically significant difference between ABC Unit Cost and Traditional Unit Cost for the drugs analyzed at the Pharmacy Unit of Martha Friska Multatuli Hospital. The standardized test statistic ($Z = -8.682$) confirms that the difference is not merely descriptive but statistically robust, and the consistent direction of the ranks shows that ABC Unit Cost is systematically higher than Traditional Unit Cost. This finding should be read carefully: undercosting in the cost comparison is not equivalent to a tariff loss whether the selling price still yields a margin must be assessed separately by comparing selling price with ABC Unit Cost or the ABC-based proposed tariff.

f) Effect Size

Table 10. Wilcoxon Effect Size

Statistic	Value
Z value	-8.682
Absolute Z	8.682
Number of observations (N)	100
$\sqrt{N}$	10.00
Effect size (r)	0.868
Category	Large

Source: Results of data processing, 2026.

With $r = 0.868$, well above the 0.50 threshold for a large effect (Cohen, 1988), the difference between ABC Unit Cost and Traditional Unit Cost is not only statistically significant but also practically substantial. For management, an effect of this magnitude is a reasonable basis for improving the pharmacy cost-information system, since relying on traditional cost information alone risks overstating drug margins once activity costs are properly accounted for.

g) Cost Distortion, Actual Margin, and Tariff Deviation

Table 11. Classification of Cost Distortion – Traditional Unit Cost versus ABC Unit Cost

Category	Criterion	Number of Drugs	Percentage
Undercosting	Traditional Unit Cost < ABC Unit Cost	100	100%
Overcosting	Traditional Unit Cost > ABC Unit Cost	0	0%
No difference	Traditional Unit Cost = ABC Unit Cost	0	0%

Source: Results of data processing, 2026.

All 100 sampled drugs are undercosted under the traditional system, meaning Traditional Unit Cost is below ABC Unit Cost for every observation, because Traditional Unit Cost mainly reflects the average purchase price while ABC Unit Cost adds procurement, service, and facility/storage activity costs. This does not imply that every drug is sold below cost or that the hospital is losing money on every item; it only signals that traditional cost information

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does not yet fully capture activity-cost consumption. Whether the selling price remains adequate must be examined through actual margin and tariff deviation.

Table 12. Classification of Tariff Deviation and Actual Margin

Category	Criterion	Number of Drugs	Percentage	Mean Deviation/Unit (IDR)
Positive tariff deviation	Selling price > ABC-based proposed tariff	79	79%	3,452.14
Negative tariff deviation	Selling price < ABC-based proposed tariff	21	21%	-185.91

Source: Results of data processing, 2026.

79 drugs show a positive tariff deviation and 21 show a negative tariff deviation relative to the 20%-margin ABC-based proposed tariff. The mean deviation is IDR 3,452.14 per unit for the positive group, against IDR -185.91 per unit for the negative group indicating that the positive group is not only larger but also carries a wider margin buffer on certain items, while the smaller negative group still matters because several of its members are high-volume drugs. This classification is not a directive to automatically cut tariffs for the positive group or raise tariffs for the negative group; tariff decisions must still weigh regulation, patient purchasing power, financing contracts, drug availability, clinical function, and hospital strategy. The classification instead serves as a prioritization tool indicating which drugs merit review first.

h) Priority Drugs: Largest Tariff Deviations

Table 13. Ten Drugs with the Largest Positive Tariff Deviation

No	Drug	Qty Sold	Selling Price (IDR)	ABC Unit Cost (IDR)	Proposed Tariff (IDR)	Deviation/Unit (IDR)
1	Ringer Acetate (Asering)	13,495	38,089.65	7,529.05	9,034.86	29,054.79
2	Ceftriaxone 1 g	48,331	25,817.11	5,489.91	6,587.90	19,229.22
3	Ketorolac 30 mg inj.	34,9	20,792.08	2,815.95	3,379.14	17,412.93
4	Ringer Lactate 500 mL	61,238	24,598.80	7,067.77	8,481.33	16,117.48
5	NaCl 0.9% 500 mL	52,753	22,945.56	6,391.26	7,669.51	15,276.05
6	Aripiprazole 10 mg	13,642	29,886.46	12,790.16	15,348.20	14,538.27
7	NaCl 100 mL	14,428	20,914.51	5,666.65	6,799.99	14,114.53
8	Clopidogrel 75 mg	16,008	14,714.39	928.48	1,114.18	13,600.21
9	Candesartan 16 mg	53,64	10,488.40	603.33	723.99	9,764.41
10	Adalat Oros 30 mg	50,542	13,615.64	4,867.73	5,841.28	7,774.36

Source: Results of data processing, 2026.

Drugs with the largest positive deviation are dominated by intravenous fluids, injections, and a few high-value tablets Ringer Acetate, Ceftriaxone 1 g, Ketorolac 30 mg injection, Ringer Lactate, and NaCl 0.9%—most of which combine a relatively high selling price with substantial sales volume. From the hospital's perspective, this group contributes meaningfully to the pharmacy margin pool; from a tariff-governance perspective, deviations of this magnitude, especially for frequently used drugs, warrant an audit to confirm that the tariff has a defensible cost, clinical, and policy basis, rather than being automatically reduced.

Table 14. Ten Drugs with the Largest Negative Tariff Deviation

No	Drug	Qty Sold	Selling Price (IDR)	ABC Unit Cost (IDR)	Proposed Tariff (IDR)	Deviation/Unit (IDR)
1	Stesolid 2 mg	13,604	691.40	1,245.81	1,494.97	-803.57
2	Amitriptyline 25 mg	14,137	221.85	486.78	584.14	-362.29
3	Vitamin B1 (Thiamine) 50 mg	14,506	7.50	276.39	331.67	-324.17
4	Empty capsule No. 00	40,765	13.96	270.26	324.31	-310.35

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5	Empty capsule No. 0	17,18	9.80	239.51	287.41	-277.61
6	Empty capsule No. 1	12,82	5.35	235.10	282.12	-276.76
7	Ibuprofen 200 mg	12,993	237.21	396.89	476.27	-239.06
8	Isosorbide Dinitrate 5 mg	14,808	339.12	423.37	508.04	-168.93
9	Propranolol 10 mg	12,289	204.66	303.56	364.27	-159.61
10	Metformin 500 mg	32,183	331.25	400.48	480.58	-149.33

Source: Results of data processing, 2026.

Drugs with the largest negative deviation are mostly low-priced items—Stesolid 2 mg, Amitriptyline 25 mg, Vitamin B1, and empty capsules for which the selling price sits below the ABC-based proposed tariff and, in some cases, below ABC Unit Cost itself. Because activity cost is roughly IDR 170–190 per unit regardless of drug price, this fixed increment becomes proportionally large relative to a low selling price, so inexpensive drugs are not automatically "safe" once activity cost is taken into account. Management need not raise every negative-deviation drug's tariff automatically some may be deliberately kept at a low margin for access or clinical reasons—but the list deserves attention from the Unit Cost Team, particularly for high-volume items where the per-unit shortfall accumulates into a material economic effect.

i) Volume-Based Economic Value of Tariff Deviation

Table 15. Volume-Based Economic Value of Tariff Deviation

Item	Number of Drugs	Economic Value (IDR)	Interpretation
Positive tariff deviation	79	9,496,824,803	Margin headroom from drugs priced above the proposed tariff
Negative tariff deviation	21	92,285,511	Shortfall relative to the proposed tariff
Net deviation	100	9,404,539,292	Net volume-based economic difference
Actual margin vs. ABC Unit Cost	100	10,311,966,153	Volume-based selling price minus ABC Unit Cost
Total sample sales value	100	14,849,100,457	Total sales value of the 100 sampled drugs

Source: Results of data processing, 2026.

On a volume basis, the positive-deviation group represents an economic value of IDR 9.50 billion against IDR 92.29 million for the negative-deviation group, for a net positive deviation of about IDR 9.40 billion. Total actual margin relative to ABC Unit Cost across the 100 sampled drugs is IDR 10.31 billion against total sample sales of IDR 14.85 billion. While the aggregate picture is positive, the presence of a negative-deviation group still needs to be examined, because it may indicate a subset of drugs that have not yet fully recovered their activity cost; prioritization should combine per-unit deviation with sales volume, since a large per-unit deviation on a low-volume drug can matter less than a moderate per-unit deviation on a very high-volume drug.

j) Characteristics of Deviation by Dosage Form and Purchase-Price Tier

Table 16. Tariff-Deviation Characteristics by Dosage Form

Dosage Form	n	Positive	Negative	Mean Traditional (IDR)	Mean ABC (IDR)	Mean Deviation (IDR)	Economic Value (IDR)
Tablet (TAB)	81	64	17	923.59	1,102.21	1,453.56	4,335,783,619
Capsule (CAPS)	7	3	4	473.42	647.94	807.98	312,352,101
Infusion fluid (FLS)	5	5	0	5,717.52	5,899.34	16,414.67	2,525,116,500
Ampoule (AMP)	5	5	0	2,105.00	1,927.23	7,914.04	1,252,934,269
Vial (VIAL)	1	1	0	5,314.40	5,489.91	19,229.22	929,444,308
Special liquid (CC)	1	1	0	3,436.10	3,244.87	4,547.51	48,908,496

Source: Results of data processing, 2026.

Tablets dominate the sample by count (81 of 100 drugs), consistent with their high share of pharmacy transactions, but the largest per-unit deviations belong to infusion fluids, ampoules, and vials, whose higher selling prices and unit costs generate wider absolute margins. Parenteral and liquid preparations tend to involve more complex handling stock control, expiry monitoring, adequate storage space, and more careful dispensing than oral preparations, so even though the current driver structure still relies partly on proxies, the deviation pattern by dosage form is informative for refining the ABC model further. In practical terms, this indicates that a uniform margin policy across all dosage forms is not ideal; the hospital should consider differentiating tariff evaluation between oral, injectable, infusion, and specially monitored drugs.

Table 17. Tariff-Deviation Characteristics by Purchase-Price Quartile

Quartile	n	Positive	Negative	Mean Traditional (IDR)	Mean ABC (IDR)	Mean Deviation (IDR)	Economic Value (IDR)
Q1 (cheapest)	25	13	12	140.95	318.10	189.78	304,892,950
Q2	25	19	6	319.74	497.10	1,125.50	1,443,091,384
Q3	25	22	3	748.03	926.08	1,635.55	1,298,688,319
Q4 (most expensive)	25	25	0	3,787.58	3,969.20	7,801.75	6,357,866,639

Source: Results of data processing, 2026.

The pattern across purchase-price quartiles is intuitive: the highest-price quartile (Q4) accounts for all 25 positive deviations and the largest economic value, indicating that high-purchase-price drugs generally have selling prices already sufficient to cover ABC Unit Cost and the target margin. The lowest-price quartile (Q1) has the highest share of negative deviations (12 of 25), because a fixed activity-cost increment of roughly IDR 170–190 is proportionally large relative to a very low selling price. This suggests that a single flat percentage margin does not translate into proportionally adequate rupiah margin across the price spectrum: for expensive drugs, the same percentage yields a large rupiah margin, while for cheap drugs it may not be enough to cover the minimum activity cost. A combination of percentage margin and a minimum activity-cost floor may therefore be a more rational tariff formulation.

k) Margin Sensitivity Analysis

Table 18. Margin Sensitivity Analysis

Target Margin	Mean Proposed Tariff (IDR)	Mean Deviation (IDR)	Positive Deviation	Negative Deviation	Net Economic Value (IDR)
10%	1,570.38	2,830.91	82	18	9,858,252,722
15%	1,641.77	2,759.53	81	19	9,631,396,007
20%	1,713.15	2,688.15	79	21	9,404,539,292
25%	1,784.53	2,616.77	77	23	9,177,682,577
30%	1,855.91	2,545.38	75	25	8,950,825,862

Source: Results of data processing, 2026.

As the target margin rises from 10% to 30%, the ABC-based proposed tariff rises correspondingly, the number of drugs classified as negative-deviation grows from 18 to 25, and the net economic value declines. This confirms that the tariff-deviation classification is sensitive to the margin policy chosen by management and should therefore be treated as a policy assumption rather than a universal constant; the results of this study are best used as a managerial simulation to support tariff review rather than as a mechanical instruction to adjust every price.

B. Discussion

The finding that ABC Unit Cost differs significantly, and substantially, from Traditional Unit Cost is consistent with the core premise of Activity-Based Costing: cost information becomes more accurate when indirect costs are traced through the activities that consume resources, rather than allocated in aggregate as in traditional systems, which can produce distorted cost information (Mahesha, 2022). At the Pharmacy Unit of Martha Friska Multatuli

Hospital, Traditional Unit Cost mainly reflects the average purchase price, but drugs continue to consume resources after purchase—through receiving, inspection, recording, storage, picking, preparation, and dispensing—that require labor, facilities, utilities, equipment, and administration. ABC traces these activity costs down to the individual drug item, and the resulting mean increment of IDR 178.55 per unit is material enough that relying on Traditional Unit Cost alone risks understating drug cost, an effect that is more consequential for low-priced drugs where the fixed activity-cost increment represents a larger share of the selling price. Academically, this reinforces the relevance of ABC in the healthcare sector, where indirect costs are large and where a high-transaction unit such as pharmacy particularly benefits from a costing system able to trace activity cost more accurately rather than relying on purchase price alone.

The complete absence of overcosting cases in this sample—all 100 drugs are undercosted under the traditional system—follows directly from how Traditional Unit Cost is operationalized here: since it is essentially the average purchase price, and ABC Unit Cost adds activity cost on top of that same purchase price, ABC Unit Cost is mathematically guaranteed to be higher. This is not a flaw in the result; rather, it demonstrates that the prevailing system has not yet integrated activity cost into the drug unit-cost figure. The managerial implication is that margin may look more favorable than it really is if management compares selling price only against purchase price: a drug that appears profitable on a purchase-price basis can show a materially smaller margin once activity cost is included, particularly for low-priced, high-volume, or administratively intensive drugs. This does not mean the prevailing tariff must automatically be raised—tariff decisions must still weigh patient purchasing power, regulation, financing schemes, clinical necessity, and service strategy—but ABC's role is to supply a more complete cost basis for that decision.

The characteristics of drugs at the extremes of tariff deviation point to a segmentation logic for tariff policy. Drugs with the largest positive deviation tend to be higher-priced items with an important service function—infusions, vials, ampoules—that generate substantial margin headroom because selling price is far above the proposed tariff; from a financial standpoint this strengthens pharmacy revenue, but from a governance standpoint these items still warrant periodic review so that margin does not drift too far from its cost basis, especially for drugs in frequent use. Drugs with the largest negative deviation tend to be low-priced items—vitamins, generic tablets, empty capsules—where the minimum activity cost can be a large proportional burden; individually the rupiah shortfall looks immaterial, but multiplied by transaction volume it can become economically significant. This contrast suggests that high-volume drugs should be monitored for total economic value, high-priced drugs for margin fairness, and low-priced drugs for adequacy of activity-cost recovery.

Evaluating actual margin against ABC Unit Cost (rather than the proposed tariff) shows a mean actual margin of 178.71%, but with fifteen drugs showing a negative actual margin and six more with a positive margin below the 20% target—groups that merit different managerial responses: negative-margin drugs should be reviewed for purchase price, volume, tariff policy, and clinical rationale, while below-target but positive-margin drugs can be monitored alongside changes in purchase price, supplier terms, and patient consumption patterns. A very high aggregate margin should also be read critically: without a clear cost or policy basis, an unusually large margin can itself raise questions about tariff fairness, so tariff policy should look at the dispersion of margin across drugs and not only the aggregate figure.

Overall, the results carry both economic and managerial implications for the hospital. Economically, pharmacy activity cost has a real effect on drug cost of goods; omitting it from the costing system risks tariff decisions based on incomplete cost information, manifesting at the drug level as undercosting and, where selling prices have not kept pace, as negative tariff deviation or low actual margin. Managerially, the findings support: (1) strengthening the recording of pharmacy activities—prescription service time, transaction frequency, storage type, refrigerated-storage use, storage duration, returns, expired stock, and controlled-drug oversight—so that ABC cost assignment becomes more accurate in future periods; (2) establishing or strengthening a dedicated Unit Cost Team to review activity costs, test the reasonableness of drivers, validate unit-cost results, and recommend tariff changes to management before they are adopted; (3) integrating pharmacy data (purchasing, receiving, inventory, sales, returns, operating cost, and service activity) with the hospital information system so that unit-cost evaluation is less dependent on manual data collection and can respond more quickly to changes in purchase price or tariff policy; and (4) developing a tariff formula that combines average purchase price, a minimum activity cost, a percentage margin, and policy factors, rather than relying on a single uniform margin regardless of activity cost or drug characteristics.

In sum, ABC functions here as a decision-support tool that improves the completeness of cost information without replacing managerial judgment: management should treat drugs with negative actual margin or large

negative tariff deviation as first-priority review items, particularly where volume is high; treat drugs with a positive but below-target margin as second-priority items to monitor as purchase prices and consumption patterns change; and treat drugs with very large positive deviation as third-priority items for a tariff-fairness audit, especially where they are in frequent use or have generic alternatives. The final tariff decision must still incorporate regulation, service ethics, patient affordability, financing contracts, and hospital strategy; the contribution of ABC is to make the cost basis for that decision more transparent, traceable, and defensible—including for internal control purposes, since every proposed tariff change can be documented with average purchase price, ABC Unit Cost, actual margin, the ABC-based proposed tariff, tariff deviation, and the managerial rationale behind it.

CONCLUSION

This study calculated ABC Unit Cost at the Pharmacy Unit of Martha Friska Multatuli Hospital by grouping indirect costs into procurement/administration, service/dispensing, and facility/storage cost pools, yielding a mean ABC Unit Cost of IDR 1,427.62 against a mean Traditional Unit Cost of IDR 1,249.08 higher because ABC explicitly incorporates pharmacy activity cost. The Wilcoxon Signed-Rank Test confirmed a statistically significant difference between the two cost measures ($p < 0.001$), with a large effect size ($r = 0.868$), indicating that the choice of costing method has a material effect on drug cost information. All 100 sampled drugs were undercosted under the traditional system, a finding interpreted as a distortion in cost information rather than a tariff loss.

Tariff evaluation using the 20%-margin ABC-based proposed tariff showed 79 drugs with positive tariff deviation and 21 with negative tariff deviation; the negative-deviation group warrants priority evaluation because it may compress actual margin. Drugs with the largest positive deviation were generally high-priced items such as infusions, vials, and ampoules, while drugs with the largest negative deviation were generally low-priced items such as tablets, vitamins, and supporting materials sensitive to the addition of activity cost indicating a need for tariff-policy segmentation based on dosage form, purchase price, volume, and actual margin. The principal managerial implication is the need to strengthen the pharmacy unit-cost system through more detailed activity recording, periodic tariff evaluation, actual-margin analysis, a stronger Unit Cost Team, and the integration of pharmacy data with the hospital information system. The findings can serve as an initial basis for reviewing tariff fairness, but any tariff change must still weigh clinical considerations, regulation, patient affordability, and internal hospital policy.

This study has several limitations. Available pharmacy-activity data do not yet cover per-drug prescription service time, per-item storage duration, detailed cold-storage use, or the intensity of oversight for specific drugs, so several drivers rely on the most reasonable available proxy; the facility/storage cost pool, in particular, still uses the number of items sold as a proxy because item-level data on storage area, storage volume, and dwell time are not documented. The study uses 2025 data as a single observation period, so changes in purchase price, suppliers, disease patterns, and tariff policy across periods have not been analyzed longitudinally. The study was conducted at a single hospital, so the results represent an internal evaluation and are not intended to be generalized directly to other hospitals, each of which has a different cost structure, tariff policy, service volume, and procurement system. Finally, the 20% target margin was used as an internal policy assumption in constructing the ABC-based proposed tariff and has not been tested as a normative industry standard, so the tariff-deviation results should be read as a managerial simulation that may change under a different margin policy.

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