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Operational Efficiency in the Pharmaceutical Supply Chain: Evaluation of Key Inventory Management Indicators

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Abstract — **The quality of care depends on efficient logistics management, essential for preventing supply disruptions of medicines and medical devices. The COVID-19 crisis exposed vulnerabilities in the pharmaceutical supply chain, particularly regarding delays and stockouts. Improving operational efficiency hinges on optimization of resources and logistics processes. In this context, strategic sourcing combined with regular assessment of inventory KPIs makes it possible to mitigate both overstocking and shortages. However, recent studies indicate that systematic use of these indicators remains limited in healthcare facilities, leading to poor forecasting capabilities and management that is reactive rather than proactive. Strengthening monitoring mechanisms, alongside better coordination between stakeholders, appears indispensable for ensuring reliable decision-making processes. Thus, integration of relevant KPIs, proactive risk management, and continuous adaptation of operational models constitute essential levers for increasing resilience and performance of the pharmaceutical supply chain.**
Keywords—Pharmaceutical supply chain, Inventory management, Operational efficiency, Key Performance indicators

I. INTRODUCTION

Public health advancement depends on healthcare organizations' capacity to deliver reliable care through an optimized pharmaceutical supply chain ensuring medicine quality, accessibility, and availability [1]. Operational efficiency is critical for guaranteeing continuous supply and preventing stockouts, whose consequences can be severe for patient health. Stockouts disrupt hospital operations [2], requiring robust medicine flow management. The pharmaceutical supply chain's objective is delivering medicines at the right time, place, and minimum cost [3]. Achieving this requires coordination among manufacturers, suppliers, wholesalers, and distribution points to deliver adequate quantities while minimizing overall system costs [2].

Preventing stockouts demands efficient inventory management systems capable of detecting anomalies, anticipating risks, and correcting dysfunctions through monitoring. International institutions such as the FDA and WHO have recognized drug shortages as a major public health issue and implemented strategies to mitigate occurrence [4]. Mastering determinants of stockouts constitutes an essential step for healthcare systems seeking to prevent and mitigate impacts [5].

This study conducts an analysis of pharmaceutical inventory management to identify risks and propose improvement actions using Key Performance Indicators (KPIs) that enable continuous performance tracking and optimization. The research methodology outlines identification and application of KPIs in inventory management to enhance efficiency and minimize waste. The results section presents findings and proposes corrective actions to prevent stockouts and optimize medicine distribution. Finally, the article concludes with remarks and future research perspectives.

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II. LITERATURE REVIEW

A. *Pharmaceutical Supply Chain*

The pharmaceutical supply chain encompasses all operations necessary for the delivery of medicines, from production to end patients. It comprises activities such as procurement, production, quality control, distribution, as well as management of returns and expired products [6]. The pharmaceutical industry, as a strategic sector of the global economy, has experienced growth, with its commercial value rising from 113 billion dollars in 2000 to 629 billion dollars in 2019 [7]. This expansion confers a central role upon the pharmaceutical supply chain within the healthcare sector, due to its implications for overall costs [8].

In this context, the management of risks associated with the pharmaceutical supply chain, particularly within hospital pharmacies, requires the implementation of management systems. These must enable monitoring of inventory levels, expiration dates, and medicine flows, in order to prevent stockouts and optimize operational efficiency of the entire chain [9].

B. *Operational Efficiency in the Pharmaceutical Supply Chain*

Operational efficiency refers to the capacity to optimally utilize all available resources. It aims to reduce waste, improve process fluidity, and strengthen overall performance by aligning mobilized resources with the organization's actual needs [10]. It is reflected in the performance of the various processes that compose the chain, including procurement, production, storage, distribution, and information management, thereby ensuring the continuous availability of medicines [11]. According to Adedeji B. Badiru [12], efficiency can be categorized in two ways:

- Absolute Operational Efficiency (AOE) compares a system's actual performance to its ideal performance (i.e., perfect conditions defined theoretically or in a laboratory setting). It is expressed as: AOE = Actual Performance / Ideal Performance.
- Relative Operational Efficiency (ROE) compares a system's actual performance to the best performance observed within a comparable set. It is expressed as: ROE = Best Observed Performance / Actual Performance.

Empirical studies indicate that the main sources of operational inefficiency are linked to financial constraints, communication issues, waste, organizational complexity, and a lack of visibility over flows [1].By optimizing the design and operation of the supply chain, the company reduces lead times, improves the reliability of its deliveries, and utilizes its capacities more efficiently, thereby contributing directly to its operational efficiency [13].

C. *Drug Stockouts*

This phenomenon can be defined as the inability of a pharmacy to dispense a medication to a patient, or the unavailability of a product within a healthcare facility [14]. Beyond its definition, the unavailability of medicines entails consequences for the healthcare system, particularly for patients. It can lead to monitoring, less effective treatments, delays or interruptions of care, as well as prolonged hospitalizations or readmissions. In severe cases, it can endanger patients' lives [15].

These impacts are explained by the fragility of the pharmaceutical supply chain: disruptions can become major crises. This underscores the role of demand forecasting to limit stockout risks. However, current mechanisms remain reactive and focus more on managing consequences than anticipating causes [16].

In light of this, several levers for action exist. Supply chain risk management approaches rely on improved information sharing or safety stocks. Enhancing flexibility, via contracting with multiple suppliers, also appears as a key measure to reduce vulnerability and prevent stockout situations [17].

D. *Key Performance Indicators*

According to Domínguez, Key Performance Indicators (KPIs) represent measures focusing exclusively on the aspects of organizational performance that are "the most critical for the current and future success of the organization" [18]. They do not merely measure an activity; they measure the attainment of a strategic objective

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[18]. Indicators play a central role by ensuring the translation of the strategic vision into operational actions. They constitute a bridge between strategy, execution, and value creation, in accordance with performance management system approaches [19]. By making strategic objectives measurable, they facilitate decision-making, align practices, and ensure coherence of the value chain [19]. KPIs act as a common language within the enterprise. By making performance visible, they guide employee behavior. However, the literature warns: poorly designed indicators can lead to dysfunctional behaviors [20].

III. Research Methodology

A. Study Setting

This research was conducted at the central pharmacy of the Mohammed VI University Hospital Center (CHU) in Oujda. This institution serves as the principal referral center for medical, surgical, and obstetrical care in the Oriental region of Morocco.

The central hospital pharmacy occupies a strategic position. It acts as the logistical nexus responsible for the procurement, storage, and dispensing of health products across all clinical departments. Its operational scope encompasses highly critical services such as emergency departments, intensive care units, operating theaters, general and specialized inpatient medicine wards.

The pharmacy's mandate extends beyond daily distribution. It ensures coordination with a network of external suppliers (pharmaceutical laboratories, wholesale distributors) and internal prescribing units. The efficiency of this organization is a prerequisite for the continuity of care and patient safety, mitigating the risks associated with stockouts, overstocking, and inefficiencies [21]

B. Study Type and Period

This is a retrospective, observational, and analytical study focusing on the analysis of pharmaceutical inventory management data for the year 2023, providing a reliable reflection of the institution’s operational performance. Specifically, this assessment translates key inventory performance indicators into a concrete measure of logistical efficiency. It demonstrates how effectively the institution balances resource optimization by minimizing drug expiration and capital immobilization with the operational responsiveness required to prevent stockouts and ensure continuity of patient care.

C. Materials and Data Sources

1) Primary Data were Extracted from Two Main Sources

To ensure the reliability and integrity of the analytical data, primary data extraction was based on a mixed approach, combining automated queries from the hospital’s enterprise resource planning (HOSIX) system with supplementary analytical databases.

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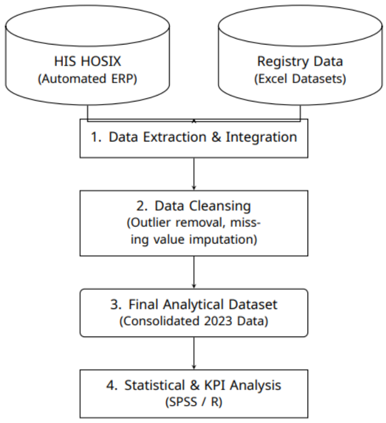

Fig. 1 Flowchart illustrating the systematic data extraction, cleansing, and processing pipeline utilized in the study.

➢ *Hospital Information System (HIS) - HOSIX Module*

Serving as the operational core of the central pharmacy, the integrated HOSIX management software acted as the primary, unaltered data source for the mass extraction of transactional data and the calculation of key quantitative performance indicators, such as stockout rates and delivery compliance. This highly efficient system facilitated the extraction of a comprehensive history of inventory movements encompassing inflows (order receptions), outflows (dispensing to clinical wards), intra-hospital transfers, and physical counts. Furthermore, HOSIX enabled the precise monitoring of available stock, batch traceability with automated expiration alerts, and the Balance to be Delivered (RAL), an essential metric for evaluating supplier shortfalls. By centralizing these critical logistical parameters, the system provided a robust and reliable foundation for the study's analytical framework.

➢ *Supplementary Tabular Databases*

In conjunction with the automated system, a set of structured spreadsheet databases was utilized. These files, aggregating data on more than one hundred therapeutic batches, provided parameters requiring derived calculations, notably:

- Adjusted Average Monthly Consumption (AMC).
- Records from physical cycle counts and annual general inventories.
- Public procurement histories (order statuses: awarded, unsuccessful, re-tendered/reminders).

2) Inclusion and Exclusion Criteria

To ensure the homogeneity of the dataset, specific inclusion and exclusion criteria were applied to the pharmaceutical inventory.

- Included: All essential allopathic medicines, emergency drugs, massive intravenous fluids, and standard anesthetics managed by the central pharmacy in 2023.
- Excluded: Controlled substances due to their highly restrictive and separate regulatory management protocols; radiopharmaceuticals; customized compounded preparations; and items used exclusively in clinical trials, as their consumption patterns do not reflect standard logistical workflows.

3) Product Stratification and Variable Definition

Given the vast number of references managed by the central pharmacy, a rigorous stratification of medications was imperative. We adopted a hybrid approach inspired by the VEN (Vital, Essential, Non-essential) classification, cross-referenced with procurement constraint parameters:

- Vital Medicines (Category V): These are absolute emergency molecules or life-saving treatments (e.g., adrenaline, insulin, specific antidotes). They require a safety stock parameterized at a high alert threshold. Any stockout of these molecules has a direct, immediate, and adverse impact on patient morbidity and mortality.
- High-Cost and Reserve Medicines: These products (often last-resort antibiotics, chemotherapies, or immunoglobulins) present major challenges. Their high unit cost and fluctuating market availability make the

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establishment of safety stocks financially and logistically risky, demanding extremely tight, just-in-time management.

4) Determination of Average Monthly Consumption (AMC)

The AMC is a fundamental parameter for sizing inventory levels. In this study, the AMC was calculated by dividing the total annual consumption by the number of effectively covered days. Crucially, days during which the product was completely out of stock were excluded from the denominator to avoid underestimating the true clinical demand [22].

Medication Consumption in Hospitals Varies According to Care Unit Specialization:

Intensive Care: Patients in intensive care generally have severe and critical medical conditions. They may require a variety of medications to stabilize their condition, relieve pain, prevent or treat infections, and more.

Cardiology: Cardiovascular diseases are one of the leading causes of death globally. Patients suffering from these diseases often require specific medications.

Emergency: In emergency departments, a wide range of acute conditions is treated, many of which require rapid pharmacological intervention. This may include analgesics, anti-inflammatories, antibiotics, etc..

Operating Theatre: During and after surgery, various medications are used for anesthesia, pain control, infection prevention, etc..

Pediatrics: Children have unique medical needs and may be particularly susceptible to conditions, such as respiratory infections, gastrointestinal issues. This can lead to medication utilization.

High consumption in these care units does not necessarily imply a low risk of expiration. Problems may arise if there is overstocking relative to consumption, or if stock rotation process (FEFO - First Expired, First Out) is not correctly applied. High consumption combined with insufficient supply management can lead to stockouts. These situations can have serious consequences for patient care.

Consumption profiles vary depending on specialty of care units. Intensive care units consume sedatives and fluids, whereas cardiology relies heavily on diuretics and antihypertensives. Table 1 synthesizes the AMC of therapeutic classes within the institution, illustrating the volume of flows the supply chain must absorb.

TABLE I

THE AMC OF VITAL MEDICINES IN DIFFERENT MEDICAL SPECIALTIES IN 2023 AT CHU OUJDA

Therapeutic Class	Most Used Medications	Global AMC
Cardiology	Furosemide	2074
Diabetology	Rapid Insulin Analogue	100
Analgesics	Paracetamol	4000
Anesthesia & Intensive Care	Propofol	1500
Antiseptics	Povidone-iodine	1060
Antispasmodics	Phloroglucinol	2387
Anti-inflammatories	Methylprednisolone 120mg	1095
Antiemetics	Metoclopramide	1320
Bulk Parenterals (IV Fluids)	Glucose 5% bag 500ml	4000
Vitamins, Electrolytes & Minerals	Sodium Chloride	3270
Hemodialysis Solutions	Bicarbonate concentrate for hemodialysis	160
Anticoagulants and Antiplatelets	Enoxaparin 4000IU	2440

These medications are essential for the proper functioning of the hospital and patient management. Their high consumption underscores the importance of adequate procurement to prevent any stockouts, and of managing expiration dates to avoid waste. The average monthly consumption is expressed in units: ampoules, vials, tablets, etc.

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D. Key Inventory Management Indicators

To evaluate the performance of the pharmaceutical supply chain at the Mohammed VI University Hospital Center (CHU) of Oujda, we selected and monitored five Key Inventory Management Indicators.These KPIs were chosen for their relevance in assessing the availability of vital products and the robustness of the pharmaceutical supply chain.

1) Drug Expiration Rate (ER)

This indicator measures the efficiency of inventory management and adherence to the FEFO (First Expired, First Out) principle. It reflects the financial loss and waste of therapeutic resources.

- **Formula:** ER = (Quantity of expired medicines / Total quantity of medicines) x 100
- **Data Source:** Physical inventories and HOSIX "Expiration" module.
- **Responsible Actor:** Pharmacy, Technician.
- **Frequency**: Monthly.

2) Stockout Rate (SR)

A critical indicator for patient safety, it evaluates the pharmacy's capacity to meet the demand of care units.

- **Formula:** SR **=** (Number of unsatisfied order lines / Total number of order lines received) x 100
- **Data Source:** HOSIX exit records and service order forms.
- **Responsible Actor:** Technician and Responsible Pharmacist.
- **Frequency:** Monthly, with immediate alerts for vital medicines.

3) Healthcare Service Satisfaction Rate (SSR)

This qualitative indicator measures the perception of logistics performance by end-users (physicians, nurses). It integrates product availability as well as the pharmacy's responsiveness to urgent requests.

- **Formula:** SSR= (Number of satisfied services / Total number of services) x 100
- **Data Source:** Quarterly satisfaction surveys distributed to heads of departments.
- **Responsible Actor:** Clinical Pharmacist and Quality Management Unit.
- **Frequency**: Quarterly.

4) Delivery Compliance Rate (DCR)

It evaluates the performance of external suppliers and the reliability of upstream procurement. Non-compliance includes quantity discrepancies, damaged products, or dosage errors upon receipt.

- **Formula:** DCR = (Number of compliant deliveries / Total number of deliveries) x 100
- **Data Source:** Supplier delivery notes and HOSIX reception modules.
- **Responsible Actor:** Purchasing Pharmacist and Reception Committee.
- **Frequency:** Monthly.

5) Inventory Reliability: Inventory Discrepancy (ID)

This indicator measures the accuracy of the HOSIX information system relative to physical reality. A low discrepancy validates the traceability of movements.

- **Formula:** ID= (HOSIX stock quantity - Physical stock quantity) / Physical stock quantity x 100
- **Data Source:** Cycle counts and annual general inventory.
- **Responsible Actor:** Central Pharmacy Team.
- **Frequency:** Quarterly (partial inventories) and Annual (general inventory).

The aggregation of these five indicators allows for the construction of a multidimensional performance matrix, surpassing simple accounting evaluation of stocks. By cross-referencing clinical availability data (stockout rate) with logistical constraints (expiration rate and inventory discrepancies), this methodology aims to identify correlations between procurement policy and the operational resilience of the institution.

E. Conceptual Framework: Multidimensional Performance Matrix

To structure our analytical framework, the aggregation of the five aforementioned indicators allowed for the elaboration of a Multidimensional Performance Matrix (Figure 2). The methodological originality of this approach lies in transcending a siloed evaluation where each indicator is analyzed in isolation to visualize systemic interdependencies.

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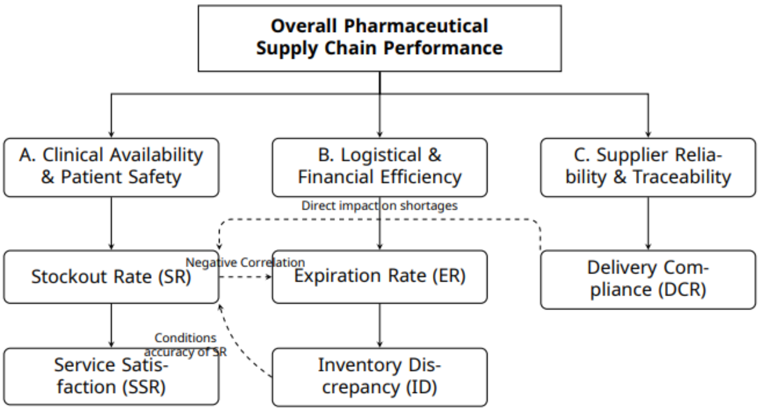

Fig. 2 Conceptual Multidimensional Performance Matrix illustrating the systemic interactions and causal loops

The central hypothesis is that "Clinical Availability and Patient Safety" (SR, SSR) depend on "Logistical and Financial Efficiency" (ER, ID) and the "Reliability of the Supplier Ecosystem" (DCR). Three causal loops dictate supply chain resilience. First, upstream supplier disruptions—delayed deliveries, discrepancies, or backorders—deplete the pharmacy buffer, exposing clinical wards to shortages.

Second, data inaccuracy distorts procurement algorithms (ID → SR). Inventory discrepancies create "phantom stocks" wherein HOSIX falsely indicates available units that are physically absent, preventing timely reordering and triggering sudden stockouts that compromise patient care.

Finally, a trade-off exists between clinical risk aversion and financial efficiency (SR ↔ ER). Pressure to prevent stockouts induces "precautionary overstocking," where safety stock levels are artificially inflated beyond evidence-based demand. This slows inventory turnover, mechanically inflating the expiration rate and violating lean management principles.

Given the observational and analytical nature of this research, data processing focused on descriptive computation of selected metrics rather than inferential statistical modeling. Data from HOSIX and physical registries were consolidated using Microsoft Excel for KPI calculation, temporal tracking throughout 2023, and dashboard construction.

The methodology provides a structured framework to assess the Operational Efficiency of the pharmaceutical supply chain, offering a comprehensive reflection of how logistical robustness dictates clinical resilience.

IV. RESULTS AND DISCUSSION

A. *Results*

This section presents the findings derived from the analysis of pharmaceutical inventory data at the CHU Mohammed VI of Oujda for the calendar year 2023. The results are structured around the five predefined Key Performance Indicators (KPIs) and their systemic interactions as conceptualized in the Multidimensional Performance Matrix.

1) General Procurement and Inventory Profile

During the 2023 calendar year, the central pharmacy managed a high-volume pharmaceutical supply chain, processing several thousand order lines through the HOSIX system, representing a diverse therapeutic portfolio. The stratification of these orders revealed that Vital Medicines (Category V) constituted approximately 35% of the total procurement volume but required over 60% of the logistical monitoring efforts due to their critical nature.

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2) Evaluation of key Inventory Management Indicators

Table 2 provides a consolidated overview of the annual average for each KPI evaluated against standard institutional targets. Data presented reflects the annual average. Monthly fluctuations were observed.

TABLE II
ANNUAL SUMMARY OF KEY PERFORMANCE INDICATORS (KPIS) FOR THE PHARMACEUTICAL SUPPLY CHAIN (2023).

KPI	Description	Target Threshold	Recorded Average (2023)
ER	Drug Expiration Rate	<3.0%	4.2%
SR	Stockout Rate (Global)	<5.0%	8.7%
SR-V	Stockout Rate (Vital Medicines)	0.0%	1.5%
SSR	Service Satisfaction Rate	>80.0%	72.4%
DCR	Delivery Compliance Rate	>90.0%	81.3%
ID	Inventory Discrepancy	<2.0%	3.8%

- *Logistical and Financial Efficiency (ER & ID)*

The Drug Expiration Rate (ER) stood at 4.2%, slightly exceeding the institutional target of 3.0%. A detailed analysis revealed that the majority of expired products were concentrated in specific categories, notably specific antidotes and high-cost, low-turnover reserve antibiotics. The financial impact of these expirations highlights inefficiencies in the FEFO rotation process.

Simultaneously, the Inventory Discrepancy (ID) rate averaged 3.8%. While relatively low, physical cycle counts identified recurring discrepancies in high-flow items, particularly massive intravenous fluids and analgesics. These discrepancies created “phantom stocks” in the HOSIX system, leading to delayed reordering.

- *Supplier Reliability (DCR)*

The external supply chain demonstrated significant vulnerabilities. The Delivery Compliance Rate (DCR) averaged 81.3%, indicating that nearly one in five deliveries presented an anomaly (e.g., partial delivery, damaged goods, or delayed reception). The lowest DCR was recorded in the third quarter (July-September), corresponding to national supply tensions for certain active pharmaceutical ingredients.

- *Clinical Availability and Safety (SR & SSR)*

The global Stockout Rate (SR) was recorded at 8.7%. However, when stratifying by criticality, the SR for Vital Medicines (SR-V) was contained at 1.5%. Although the pharmacy successfully protected most life-saving treatments, any non-zero value for vital medicines represents a critical clinical risk. Consequently, the Healthcare Service Satisfaction Rate (SSR) settled at 72.4%. Qualitative feedback from the quarterly surveys highlighted that the primary source of dissatisfaction among physicians and head nurses was not the absolute lack of medications, but rather the unpredictability of stockouts and the delays in communication regarding alternative therapeutic protocols.

3) Systemic Interactions: Matrix Correlation Analysis

Beyond isolated metrics, analyzing the temporal evolution of these KPIs validated the hypotheses established in our Multidimensional Performance Matrix. The most pronounced systemic interaction was observed between external supplier reliability (DCR) and internal clinical availability (SR). As illustrated in Figure 3, there is a clear inverse relationship between the two. In months where supplier compliance dropped (e.g., August and September), the hospital experienced a subsequent spike in clinical stockouts a few weeks later.

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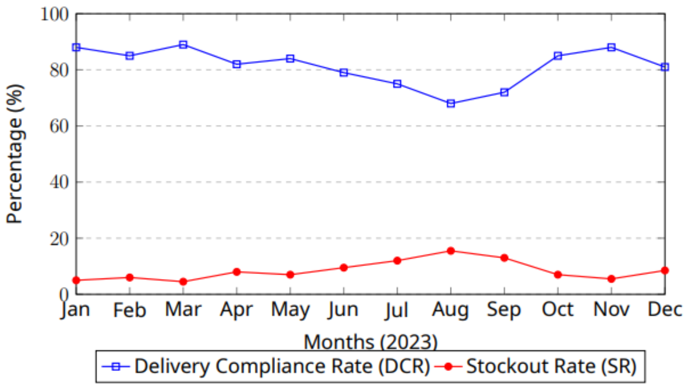

Fig. 3 Temporal evolution demonstrating the inverse correlation between Supplier Delivery Compliance (DCR) and internal Stockout Rates (SR).

Furthermore, the data confirmed the "Precautionary Overstocking" loop hypothesized in the methodology. Following the severe stockout crisis in August (SR = 15.5%), procurement behaviors shifted dramatically. The pharmacy increased bulk orders to build larger safety buffers. Consequently, data from late Q4 showed a mechanical increase in the Expiration Rate (rising from 3.1% in July to 5.4% in December) as physical storage capacities were overwhelmed and the FEFO protocol became harder to enforce.
Overall, the results demonstrate that operational efficiency in the CHU Oujda's pharmaceutical supply chain is heavily constrained by external supplier volatility, which internal logistical mechanisms attempt to buffer, often at the cost of increased financial waste.

B. Discussions

1) External Vulnerability and the Ripple Effect on Clinical Care

The recorded global Stockout Rate (SR) of 8.7% and the sub-optimal Delivery Compliance Rate (DCR) of 81.3% underscore a supply chain highly sensitive to external shocks. The sharp decline in supplier compliance observed during the third quarter directly translated into an immediate spike in clinical stockouts. This temporal correlation validates the first interaction of our Multidimensional Performance Matrix.

These findings align with global trends documented in recent literature, which highlights that hospital pharmacies are increasingly victimized by upstream disruptions, such as raw material (Active Pharmaceutical Ingredient) shortages and manufacturing delays. While the pharmacy successfully prioritized and contained the stockout rate for Vital Medicines (SR-V = 1.5%), achieving a true 0% threshold remains elusive in the current national procurement landscape. This residual shortage of life-saving drugs exposes the institution to severe medicolegal and clinical risks.

2) The "Precautionary Overstocking" and the Bullwhip Effect

One of the most salient findings of this study is the empirical demonstration of the trade-off between stockouts and expirations (SR ↔ ER). Following the severe stockout crisis in August, the pharmacy's procurement strategy shifted defensively, leading to a mechanical inflation of the Expiration Rate (ER) by the end of the fourth quarter (reaching 5.4%).

This phenomenon is a classic manifestation of the "Bullwhip Effect" in supply chain management. Driven by stockout aversion and the mandate to protect patient safety, pharmacists tend to over-forecast and inflate safety buffers. However, hospital storage capacities are finite. This overstocking congests the shelves, making the strict application of the FEFO (First Expired, First Out) principle nearly impossible, ultimately resulting in the destruction of high-value reserve antibiotics and antidotes. This highlights a critical operational paradox: attempts to maximize clinical safety through brute-force overstocking directly undermine financial and logistical efficiency.

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3) *Information Systems and the Threat of Phantom Stocks*

The Inventory Discrepancy (ID) rate of 3.8% sheds light on the limitations of automated ERP systems when uncoupled from rigorous physical processes. While the HOSIX system is robust, discrepancies predominantly affected high-flow items like IV fluids. These inaccuracies generated “phantom stocks” where the system assumed adequate supply while physical shelves were empty delaying automated reorder alerts. This emphasizes that digital transformation in hospital logistics must be accompanied by stringent physical adherence to dispensing protocols by the clinical staff to maintain data integrity.

4) *Clinical Perception vs. Logistical Reality*

Interestingly, the Service Satisfaction Rate (SSR) of 72.4% revealed a communication gap between the central pharmacy and the clinical wards. Qualitative feedback indicated that medical staff were more frustrated by the unpredictability of shortages than by the shortages themselves. In acute care settings, clinicians require real-time visibility regarding drug availability to seamlessly pivot to alternative therapeutic protocols. Enhancing the transparency of the HOSIX database to provide “live” inventory status to prescribing physicians could significantly mitigate clinical frustration and improve patient management.

V. CONCLUSIONS

This study demonstrated that the optimization of pharmaceutical inventory management fundamentally relies on the definition and rigorous monitoring of Key Performance Indicators (KPIs). By analyzing data from CHU Oujda, we were able to identify critical consumption patterns by service, evaluate stock coverage, and measure inventory reliability. These KPIs revealed major operational dysfunctions: excessive stocks on one side (immobilizing financial resources) and imminent stockouts on the other (compromising continuity of care). However, this research highlights a significant gap between computerized data and the physical reality of stocks. Future research must deepen this comparative analysis of actual stock versus computerized stock to understand the sources of divergences and strengthen the reliability of the decision-making system. Only complete mastery of this discrepancy will allow for the true optimization of operational efficiency and guarantee pharmaceutical availability in the service of patients.

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