Inventory classification of medicines using ABC and VED Analysis

A Study of pharmaceutical inventory classification by using ABC Analysis, VED Analysis and ABC–VED Matrix on **120 medicines** at a healthcare institution.

NEHA DEVI -0017

MBA DISSERTATION · IIHMR UNIVERSITY, JAIPUR

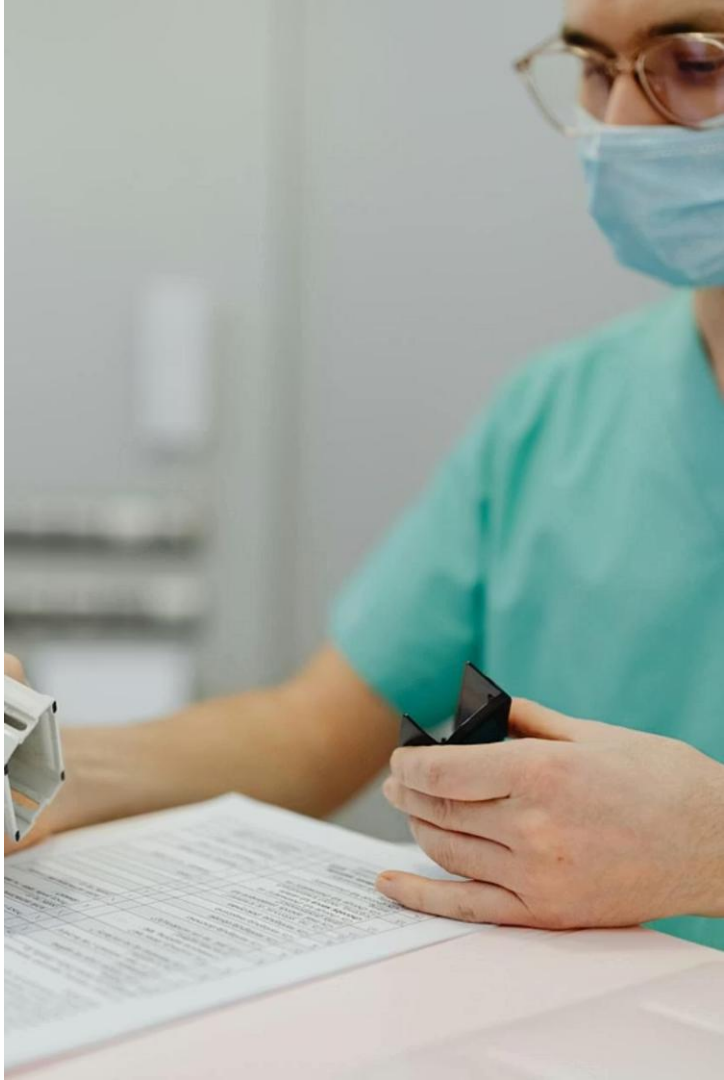
Introduction

Inventory Management in Hospitals
Ensures continuous availability of medicines and medical supplies.
Prevents stock-outs and overstocking.
Improves patient care and hospital efficiency.
Helps control procurement and storage costs.
Supports effective utilization of healthcare resources.

Need for inventory management

- Hospitals manage a large variety of medicines.
- Different medicines have different costs and criticality
- Efficient classification helps prioritize inventory control.
- ABC and VED are widely used inventory management techniques

Research Question – Is the current inventory management system sufficient to meet the medicine demand of the hospital?



Three Scientific Inventory Classification Analysis

ABC Analysis

Classifies medicines by **annual expenditure** (Pareto Principle).

Classified into 3 Categories

A – 10 to 20 % items, 70- 80% inventory control and requires strict monitoring.

B – 20-30% items, 15-20% inventory control and requires moderate control.

C – 50-70% items, 5-10% inventory control and requires simple control.

VED Analysis

Classifies medicines by **clinical criticality**: Vital (life-saving), Essential (routine care), Desirable (non-critical).

Example- Vital- Insulin injection

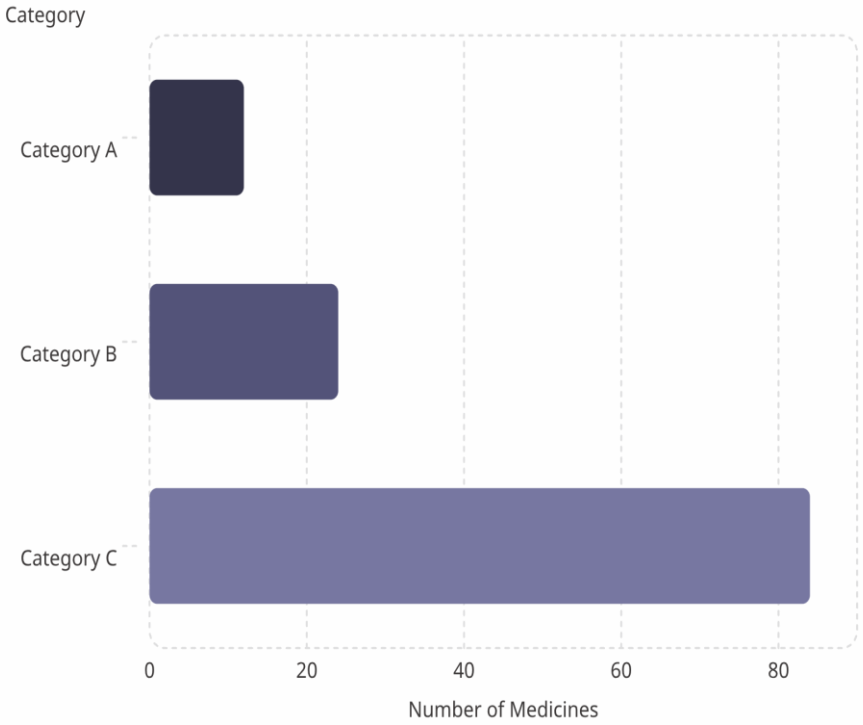
Essential – N95

Desirable – Multivitamin tablets

ABC–VED Matrix

Integrates both methods to create a **comprehensive prioritization framework** balancing cost and clinical importance.

ABC Analysis: Expenditure Classification



Category A — 12 medicines (10%)

They are usually the most valuable and require strict Supervision.
Example of medical consumables under A category – Surgical Mesh, Surgical Staplers, Haemodialysis kit

Category B — 24 medicines (20%)

Need moderate monitoring and management.
Example of medical consumables under B category – N95 Masks, ECG electrodes, urine collection bags.

Category C — 84 medicines (70%)

Lowest expenditure; managed with simplified controls.

These medicines are low-cost but high in number.

Examples of medical consumables under C category-

Cotton balls, Aprons, Face Masks

VED Analysis: Criticality Classification

What VED Means

Vital (V) — 30 medicines (25%)

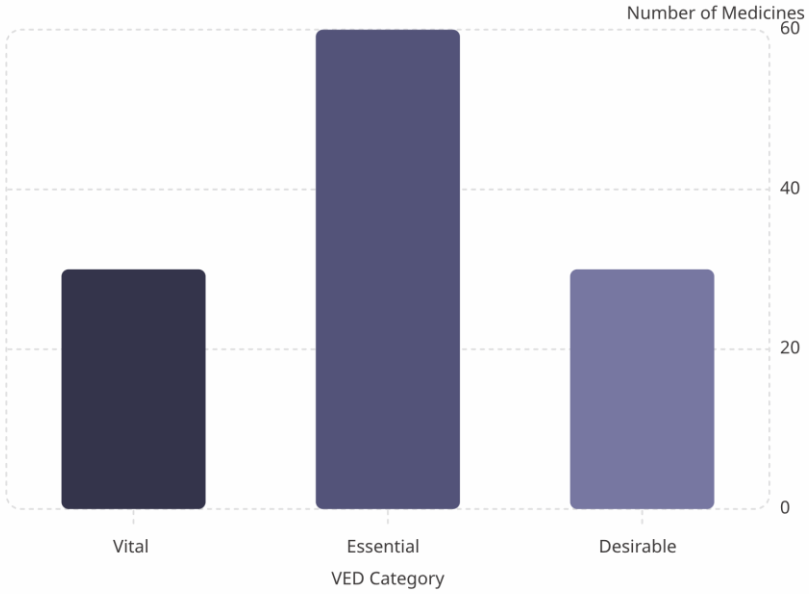
Indispensable for patient survival; non-availability poses extreme risk.
Eg – Blood transfusion sets, Dialysis kit, Oxygen masks.

Essential (E) — 60 medicines (50%)

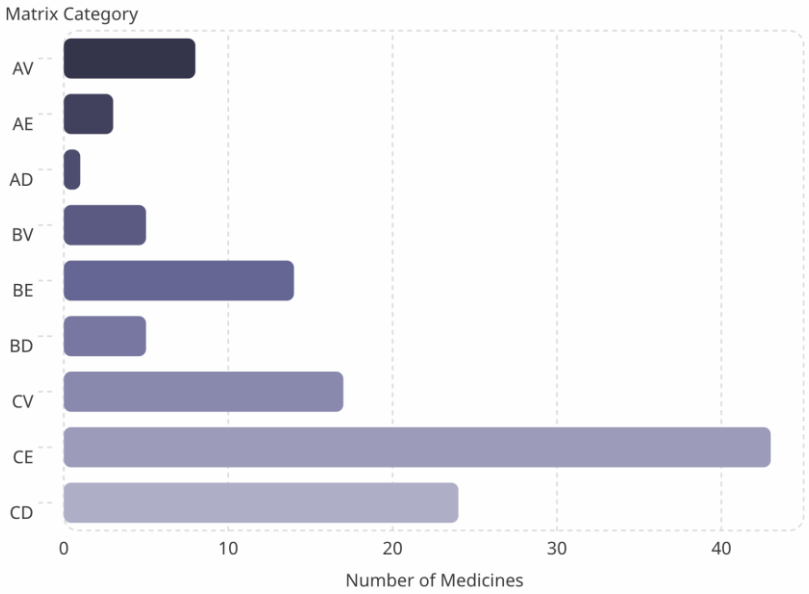
Required for routine treatment; temporary substitutes may be available.
Eg- Surgical gloves, ECG Electrodes, Nebulizer masks

Desirable (D) — 30 medicines (25%)

Useful but not critical; shortages cause inconvenience, not harm.
Eg- Shoe covers, Disposable aprons , Patient ID Bands.



ABC–VED Matrix: Full Distribution Across 9 Categories



Matrix Interpretation

The **CE category** has the highest count (43 medicines, 35.83%) — low-cost but essential items. The **AV category** (8 medicines) represents the most critical combination: high-cost *and* vital — demanding maximum managerial attention.

AV = Highest Priority: High expenditure + Vital criticality = strictest inventory control required.

Inventory Control Categories: I, II & III

1

Category I — 34 Medicines (28.33%)

AV, AE, AD, BV, CV — **Maximum attention.** High cost, high criticality, or both. Frequent audits and priority procurement.

2

Category II — 62 Medicines (51.67%)

BE, CE, BD — **Moderate control.** Periodic reviews and scheduled procurement sufficient.

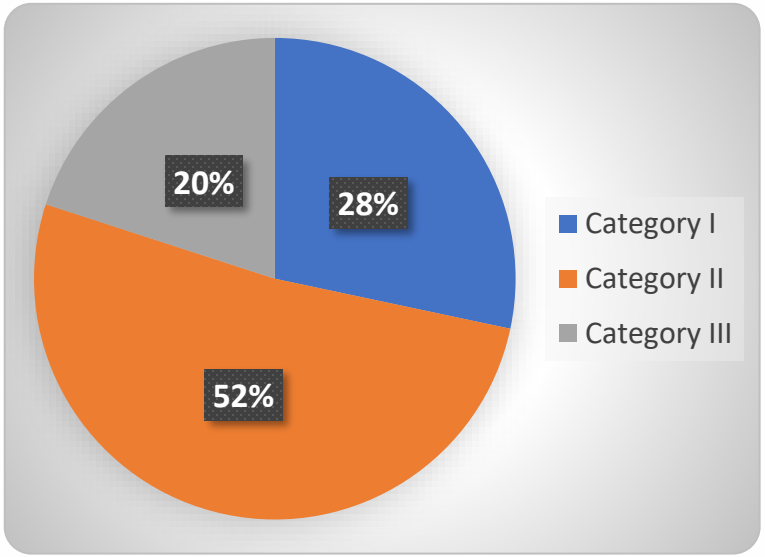
3

Category III — 24 Medicines (20%)

CD only — **Routine management.** Bulk purchasing, simplified procedures, minimal oversight.

Inventory Control strategies

The graph helps in understanding which group of medicines requires more attention in inventory management.



1.Category I represents **28%** of medicines. These are the most important and high-priority medicines, which require strict supervision and continuous availability because they are often costly or critical for patient care.

2. Category II has the highest share, accounting for **52%** of the total medicines. This means more than half of the medicines fall into this group, so they need regular monitoring and proper stock management. These medicines are generally important for routine hospital treatment.

3. Category III makes up **20%** of the medicines. This is the smallest group and includes medicines that are less critical and can be managed with lower priority.

Key Findings

120
Medicines Analyzed
Complete pharmaceutical inventory dataset related to annual consumption and expenditure of each medicine were collected and analyzed.

34
Category I Items
Highest-priority medicines requiring strictest control. They are either High costs, highly critical and important inventory items.

₹56L
Total Expenditure
Jan–May study period
Optimization of resources and reduce unnecessary costs.

16
Total Stockouts
Only 2 in Vital category — critical medicines well-protected
It reflects effectiveness of hospitals inventory practices.

Core conclusion – ABC-VED Matrix is proved effective tool and is based on both financial and clinical importance. Analysis supports in better procurement planning, inventory monitoring .
Ultimately, ensures uninterrupted availability of essential medicines and contributes patient outcome.

Recommendations & Implementation Roadmap

01

INVENTORY ASSESMENT

Maintain strict control over A Category medications.

02

CLASSIFICATION

Conduct ABC and VED Analysis; develop ABC–VED Matrix.

03

POLICY DEVELOPMENT

Establish control policies, stock standards, and procurement guidelines.

04

MONITORING & EVALUATION

Regular reviews, stockout tracking, and performance indicators.

05

CONTINIOUS IMPROVEMENT

Update classifications periodically and implement corrective actions.


THANK YOU