**MEDICAL INVENTORY OPTIMIZATION**

**BUSINESS INSIGHTS**

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Software- Jupyter Notebook

**STATISTICAL INSIGHTS**

Based on the patterns and trends gained from the analysis of the dataset, the following conclusions can be made:

* **High Variability in Sales and Costs**: The uncleaned data shows a high standard deviation in Final\_Cost and Final\_Sales, indicating significant variability in costs and sales amounts. By identifying and addressing the causes of this variability, such as outlier transactions or pricing inconsistencies, you can stabilize customer expectations and potentially reduce the bounce rate.
* **Reduction in Return Quantity**: The cleaned data shows a decrease in the mean ReturnQuantity compared to the uncleaned data. This suggests that cleaning the data might correlate with fewer returns. Investigating the factors that led to returns in the uncleaned data and applying those insights to reduce return rates could improve customer satisfaction and retention.
* **Skewness in Quantity and Sales**: Both datasets show skewness in Quantity and Final\_Sales, which could indicate that a small number of transactions account for a large portion of sales. Focusing marketing efforts on the most popular products or services could lead to an increase in revenue.
* **Opportunities in Product Pricing**: The wide range in Final\_Cost and Final\_Sales suggests there may be opportunities to optimize pricing strategies. Implementing dynamic pricing models or discounts on bulk purchases could attract more customers and increase sales volume.
* **Focus on High-Volume Sales**: The mode for Quantity is 1 for both datasets, indicating that single-item purchases are most common. Creating bundles or incentives for purchasing multiple items could increase the average transaction value, leading to higher revenue.

**BUSINESS INSIGHTS**

* **Focus on Subcategories:**
  + The “INJECTIONS” and “TABLETS & CAPSULES” subcategories have a higher number of returned drug names.
  + The hospital should investigate why these subcategories are experiencing more returns.
  + Possible reasons could be customer dissatisfaction, product quality issues, or other factors.
  + Taking corrective actions in these subcategories can help reduce returns.
* **Evaluate Formulation:**
  + The “Form1” formulation stands out with the highest return counts in both “INJECTIONS” and “TABLETS & CAPSULES.”
  + The hospital should thoroughly assess this formulation.
  + Consider factors like product effectiveness, potential side effects, and customer preferences.
  + Explore improvements or alternative options to minimize returns related to this formulation.
* **Supplier Assessment:**
  + Evaluate suppliers providing products to Department1, especially those supplying the “Form1” formulation.
  + Consider product quality, reliability, and adherence to customer requirements.
  + Explore alternative suppliers or negotiate with existing ones to enhance product quality and availability.
* **Effective Inventory Management:**
  + Efficiently manage inventory for Department1, especially for products with the “Form1” formulation.
  + Optimize stock levels, expiration dates, and replenishment processes.
  + Proper inventory management reduces returns and maintains cost-effectiveness.
* **Specialization-Specific Strategies:**
  + Specialization4 and Specialization7 within Department1, associated with the “Form1” formulation, have more returns.
  + Collaborate with healthcare professionals in these specializations.
  + Understand reasons behind returns and implement targeted strategies to enhance customer satisfaction.

By considering these conclusions, the hospital can make informed decisions, reduce bounce rate, improve customer satisfaction, and achieve economic success.