Hospital Quality Intelligence Dashboard

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Objective

This project delivers an executive-ready Tableau dashboard analyzing hospital quality metrics across the United States. The goal was to apply advanced visualization techniques — data blending, LOD expressions, forecasting, and parameter-driven sensitivity models — to explore how ownership, staffing, and geography influence healthcare outcomes.

Data Preparation

Data was based on the CMS Hospital General Information dataset and a synthetic extension that included Staff-to-Patient Ratio and Average Readmission Cost per Provider ID. Cleaning and transformation were performed in Tableau Prep, standardizing data types, mapping text ratings into numeric scales, and merging all sources by Provider ID. A final .hyper extract powered the entire dashboard.

Visualizations and Insights

The dashboard was structured into four analytical stories:

1. Hospital Quality Intelligence – Benchmarks timeliness, readmission cost, and state performance to uncover efficiency outliers and top performers.

2. Metrics by Ownership – Compares Government, Private, and Voluntary hospitals, identifying key gaps and performance strengths for each archetype.

3. Trends Analysis – Examines how staff-to-patient ratio relates to overall rating, mortality, and safety metrics using regression insights.

4. Sensitivity Analysis – Features a parameterized what-if simulator showing how Timeliness could improve under increased Emergency capacity scenarios.

Key Findings

• Voluntary (non-profit) hospitals lead in overall quality metrics.

• Private (for-profit) hospitals perform strongly in Safety and Timeliness but underperform in Readmission.

• Government hospitals align near the national average, with Mortality below benchmark.

• No clear geographical pattern exists — operational management matters more than location.

• Staff-to-patient ratio has limited predictive power; efficiency depends more on skill mix and process design.

Decision Impact

The analysis supports evidence-based improvement in healthcare systems. It demonstrates how data visualization can reveal operational inefficiencies, guide strategic decisions, and encourage resource optimization beyond staffing counts. This approach can be adapted to real-world hospital networks to identify high-value interventions and performance benchmarks.

Tools & Skills

Tableau • Tableau Prep • Data Visualization • KPI Design • Data Blending • LOD Expressions • Sensitivity Analysis • Healthcare Analytics • Storytelling with Data