**Hospital Financial Drivers and Outcomes: Revenue and Cost Component Decomposition for HEOR**

**Aim:**

* Quantify how hospital revenue and cost components drive margins and downstream clinical and operational outcomes.
* Link financial structure (net patient revenue, other operating and non-operating revenue, adjusted direct expenses, allocated overhead, total patient care costs) to access, quality, and efficiency outcomes.
* Identify leverage points for improving cost-effectiveness without degrading quality.

**Approach:**

* Define financial constructs using the dataset’s Summary\_of\_Revenue\_and\_Costs structure.
* Revenue decomposition: Net Patient Service Revenue + Other Operating Revenue + Nonoperating Revenue as total revenue; separate operating versus non-operating effects.
* Cost decomposition: Adjusted Direct Expenses (clinical-facing inputs), Allocated Costs (overhead), and Total Patient Care Costs; verify whether total patient care costs already include direct + allocated to avoid double counting.
* Normalize by activity to compare across hospitals: per discharge, per patient day, per outpatient visit, and per staffed bed.
* Link financials to operational indicators (discharges, outpatient visits, census days) and capacity (licensed/available/staffed beds) for productivity metrics.
* Use ratio metrics: operating margin, total margin, cost per case, overhead ratio (allocated costs / total costs), direct-cost intensity (direct / total), and revenue reliance on non-operating sources.
* Conduct segmentation by hospital type, size, geography; run sensitivity for case-mix proxies when available.

**Insights:**

* Margins are often more sensitive to Adjusted Direct Expenses than Allocated Costs in short-run horizons; staffing and supplies drive variance.
* Overhead allocation practices materially shift apparent service-line profitability; institutions with higher allocated-cost intensity may appear less efficient independent of direct care efficiency.
* Nonoperating revenue can mask operating underperformance; volatility risk should be highlighted.
* Normalized cost metrics (per discharge/day/visit) expose scale and productivity differences not visible in raw totals.
* Beds staffed versus available divergence signals staffing constraints that inflate direct labor costs per unit.
* Outpatient growth with flat inpatient days correlates with lower cost per encounter when direct expenses are well managed; overhead absorption becomes critical.

**Problems:**

* Risk of double-counting if Total Patient Care Costs already includes Adjusted Direct Expenses + Allocated Costs; definitions must be confirmed per column dictionary.
* Variability in overhead allocation bases (square footage, labor hours, RVUs) reduces cross-hospital comparability.
* Case-mix, acuity, and payer mix not explicitly captured can confound cost and margin comparisons.
* Non-operating revenue volatility (investment income) can distort trend analysis.

**Recommendations:**

* Standardize financial definitions: confirm whether Total Patient Care Costs is a rollup; if yes, use it as the sole total operating cost measure, not additive with direct/allocated.
* Report both operating margin and total margin, with explicit separation of non-operating contributions.
* Implement normalized KPIs: cost per discharge, cost per patient day, cost per outpatient visit, overhead ratio, and direct-cost intensity; track quarterly.
* Run a sensitivity analysis by overhead driver; test alternative allocation bases for robustness.
* Pair financial metrics with quality/access indicators to ensure value (e.g., readmissions per cost, HCAHPS vs. cost per case).
* Create an early warning dashboard for rapidly rising Adjusted Direct Expenses in labour and pharmacy.

**Impact / Expected Outcome:**

* Clear view of cost drivers enables targeted interventions (staffing mix, supply chain, pharmacy stewardship) that reduce direct costs without compromising quality.
* Separation of operating vs. non-operating effects improves fiscal risk management and strategic planning.
* Normalized, comparable KPIs enable benchmarking and identification of high-value practices.
* Expected 2–4% improvement in operating margin through direct-cost controls and overhead rationalization, with preserved outcomes via monitoring of quality metrics.