

A photograph of four healthcare workers, two men and two women, walking towards the camera in a brightly lit hospital hallway. They are all wearing white lab coats, white face masks, and blue lanyards with ID badges. The hallway has white walls, a light-colored floor, and several doors on the right side. The image is overlaid with a semi-transparent teal gradient on the left side.

RevenueRx

COSC 5500
Kayley Reith



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\$4.9 Trillion

averaging **\$13,493**
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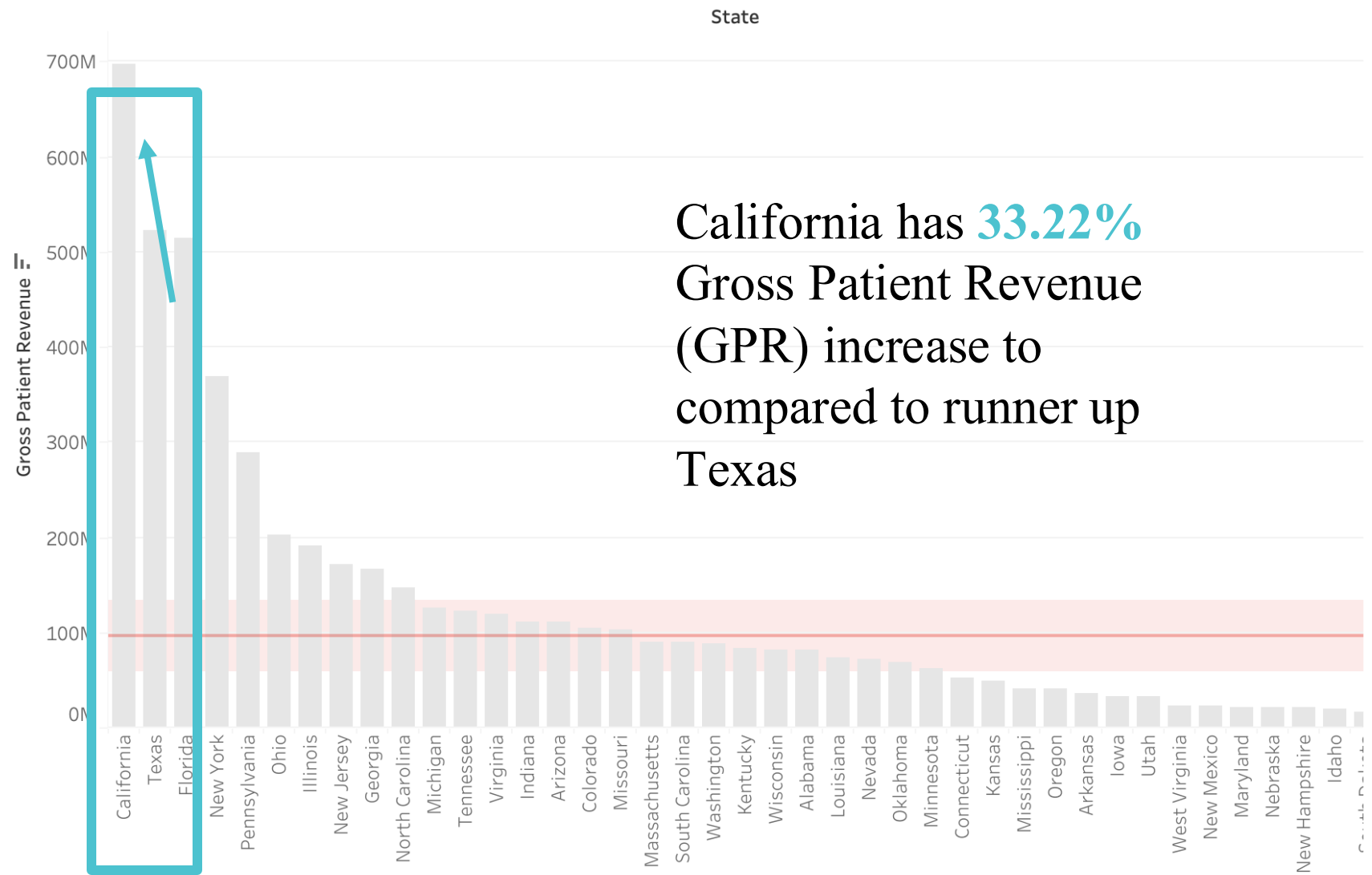
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Revenue Difference \$173,757,193

Hospital Patient Revenue by State



California has **33.22%** Gross Patient Revenue (GPR) increase to compared to runner up Texas

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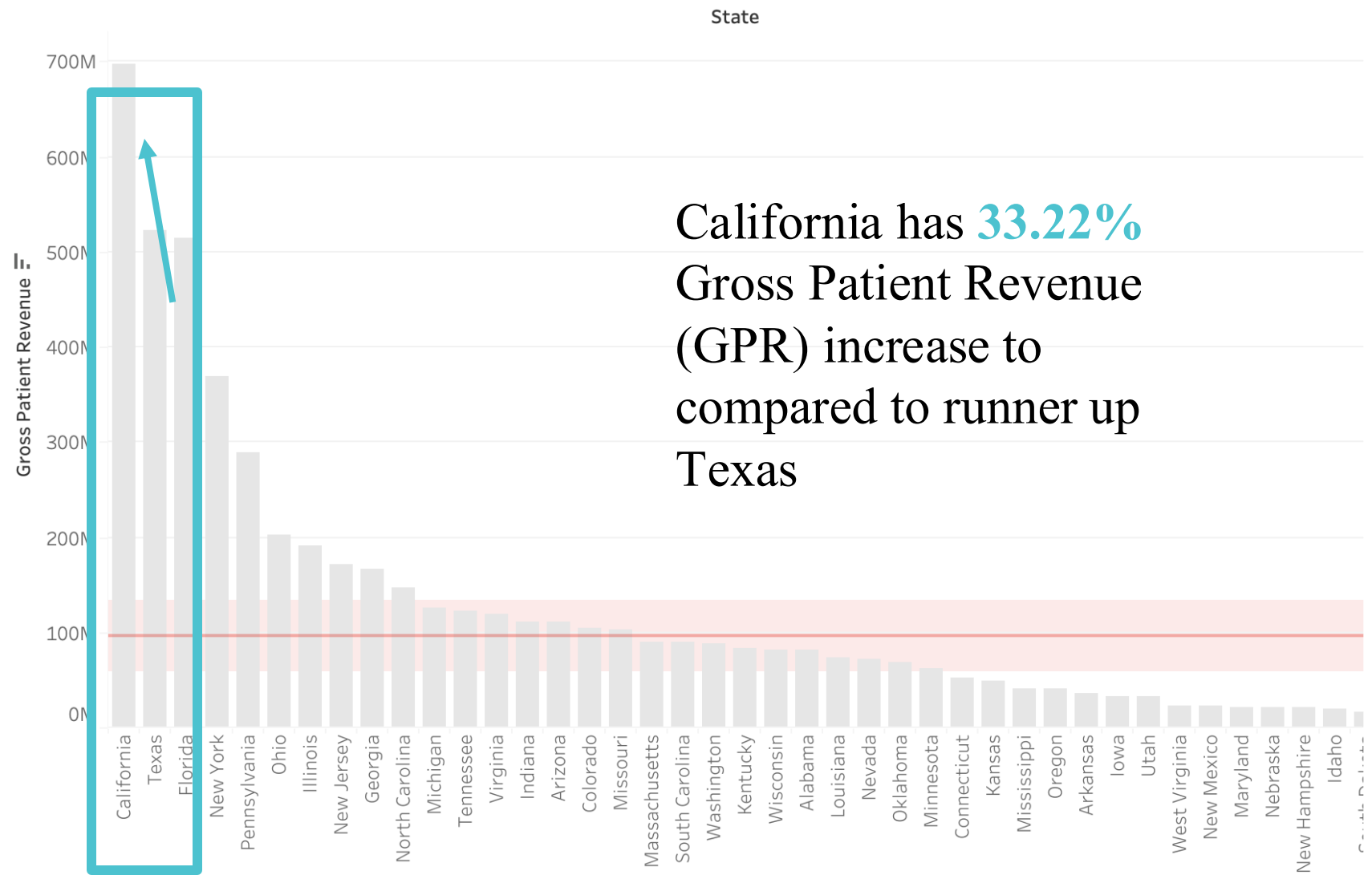
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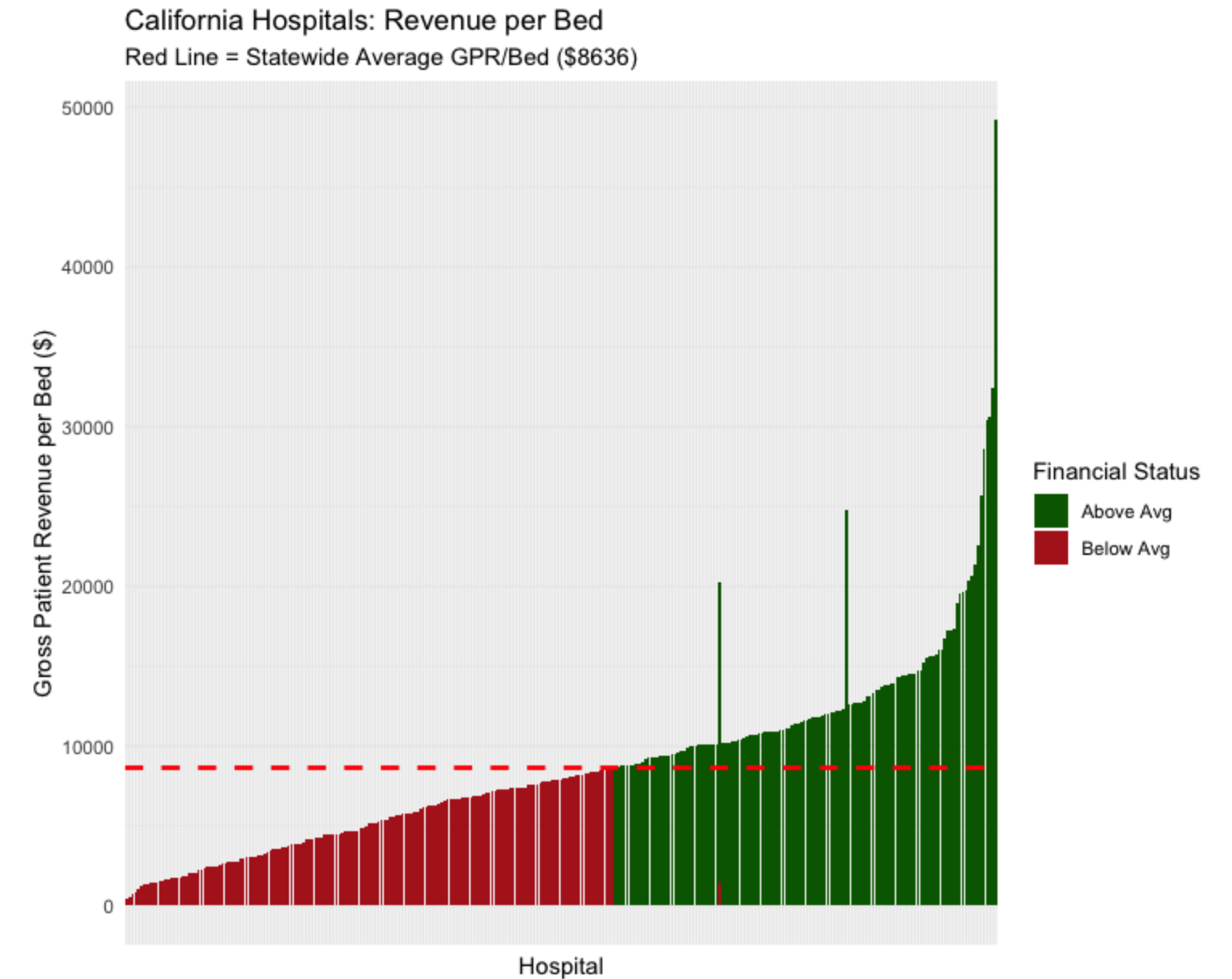
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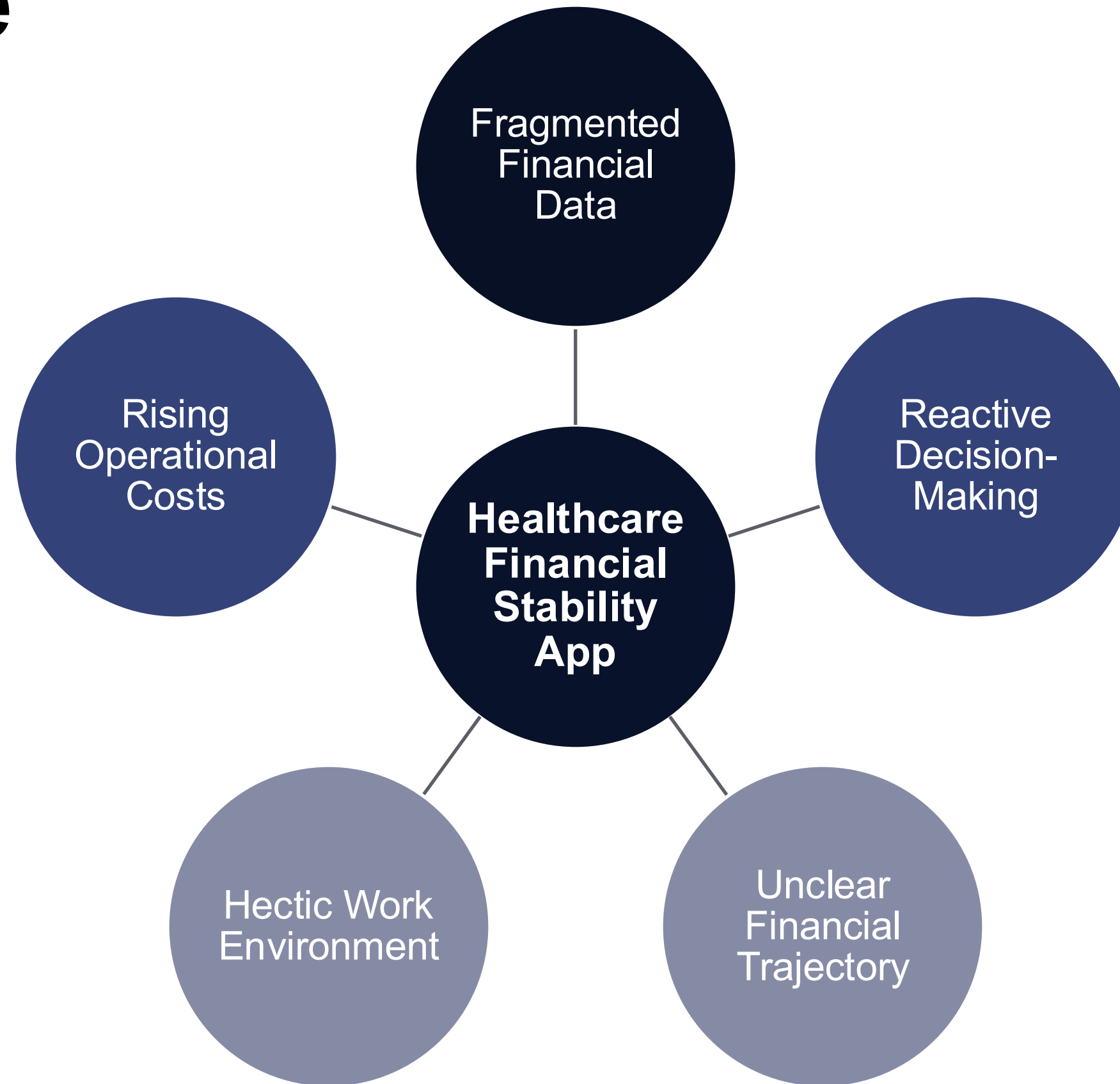
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56% below Gross Patient Revenue
(GPR) Threshold

Importance



Solution: RevenueRx is an app that unifies data to guide proactive, efficient, and financially sustainable hospital operations to ensure stability.

HCD: Empathize

Observe: View online healthcare forums and research

Engage: Informal interview and conversation with Marquette Mentor, Debbie Schmidt, to understand how health and nontechnical professionals navigate technology

Immerse: Roleplaying in the shoes of both hospital administration and medical staff, how they operate applications with work responsibilities



Debbie Schmidt
Sr Director, IT Relationship and Demand
Management
Ascension Health

HCD: Define

- Unpack insights from the empathize section
- Define problem and need for solution
- Create a question grid
- Develop an actionable problem statement
- Data management
- Roleplaying for more insights

	is...	did...?	can...?	will...?	would...?	might...?
Who	<ul style="list-style-type: none">• Benefiting from this application?• Delegating work based on the results of the operational forecasting?	<ul style="list-style-type: none">• The hospital administration report decisions to?	<ul style="list-style-type: none">• Use this app to optimize department budgets?• Ensure that insights from this app lead to actionable changes?	<ul style="list-style-type: none">• Be accountable for acting on revenue predictions?	<ul style="list-style-type: none">• Push for greater automation in hospital revenue management?• Need training to effectively use this system and app?	<ul style="list-style-type: none">• Resist adopting AI-driven revenue forecasting?• Challenge and push back on the accuracy of predictive models?
What	<ul style="list-style-type: none">• The key metric hospitals use to measure financial health?• The most common cause of revenue loss in hospitals?	<ul style="list-style-type: none">• Staff shortages cost hospitals in terms of lost revenue and patient care quality?• Patient billing trends and patient experiences reveal about gaps in hospital revenue collection?	<ul style="list-style-type: none">• Be modified in this app?• Cause an overestimated decision in staffing and patient care that leads to profit loss?• Indicate that the hospital is operating within budget?	<ul style="list-style-type: none">• Indicate the hospital is financially stable (in green zone)?	<ul style="list-style-type: none">• Be a major barrier to implementing this app?• Persuade and make hospital administrators trust AI-driven financial decisions?	<ul style="list-style-type: none">• Improve hospital relationships between admin, medical staff, and patients?• Be an unexpected outcome of revenue
Where	<ul style="list-style-type: none">• Revenue forecasting most critical in hospital operations?	<ul style="list-style-type: none">• The previous hospital budget cuts have the biggest impact on patient care?	<ul style="list-style-type: none">• Hospital financial trends be found?	<ul style="list-style-type: none">• Hospital leadership see the greatest return on investment from this app?• Data automation streamlines the most financial inefficiencies in healthcare systems?	<ul style="list-style-type: none">• Hospital administration be able to compare trends with other operating hospitals?	<ul style="list-style-type: none">• Internal data be housed within this application?
When	<ul style="list-style-type: none">• The optimal time to deploy the strategies in a week to ensure profits are grossed at an all-time high for the quarter?	<ul style="list-style-type: none">• Hospital systems begin implementing AI and data driven financial decision-making?	<ul style="list-style-type: none">• It recommend real-time staffing adjustments based on patient volume?	<ul style="list-style-type: none">• Hospitals start seeing measurable financial improvements from using this app?	<ul style="list-style-type: none">• The app be able to predict revenue fluctuations based on historical data? (i.e. holidays)• Financial transparency increase trust between hospitals and patients?	<ul style="list-style-type: none">• Hospital Leadership adjust staffing for higher revenue returns?
Why	<ul style="list-style-type: none">• This app important for strategizing healthcare officials' schedules?	<ul style="list-style-type: none">• Hospitals struggle to adopt digital financial tracking tools in the past?	<ul style="list-style-type: none">• Improving financial transparency benefit both patients and hospital leadership?	<ul style="list-style-type: none">• Some hospitals perform better than others when both utilizing the same application?	<ul style="list-style-type: none">• This app need continuous updates to remain effective?	<ul style="list-style-type: none">• Traditional financial forecasting methods become obsolete?
How	<ul style="list-style-type: none">• The app user-friendly for non-technical hospital administrators?• Patient data protected while integrating financial analytics?	<ul style="list-style-type: none">• Hospitals track their financial limits and budgets before data forecasting and compare them to others succeeding hospitals?	<ul style="list-style-type: none">• It simulate different financial scenarios to support decision-making?	<ul style="list-style-type: none">• This app help hospitals reduce unnecessary operational costs?• automation in financial reporting lead to better resource allocation?	<ul style="list-style-type: none">• Mobile-friendly and visually stimulating interface improve accessibility for hospital leaders?	<ul style="list-style-type: none">• Improved revenue management allow for better healthcare technology investments?• External factors (policy changes, pandemics, gentrified areas, population control) affect the accuracy of forecasts?



United States hospital leadership faces **frustration** in optimizing revenue and operational efficiency due to **fragmented data, hectic work environments, and reactive decision-making**. A digestible app that integrates patient experience, medical staffing, and financial simulations empowers hospital administration to make proactive, data-driven decisions in a user-friendly environment to promote long-term hospital stability.

Domain	Variable Name	Example Value
Hospital Info	Hospital Name	Adventist Health Lodi Memorial
	City	Lodi, CA
Capacity	Staffed beds	194
Patient Volume	Total Discharges	7,396
	Patient Days	33,326
Financial Performance	Gross Patient Revenue	\$2,140,355,000
Derived Metric	GPR per Bed	\$11,032.26
Derived Metric	Occupancy Rate	47.1
Derived Metric	Financial Efficiency Score	11.36

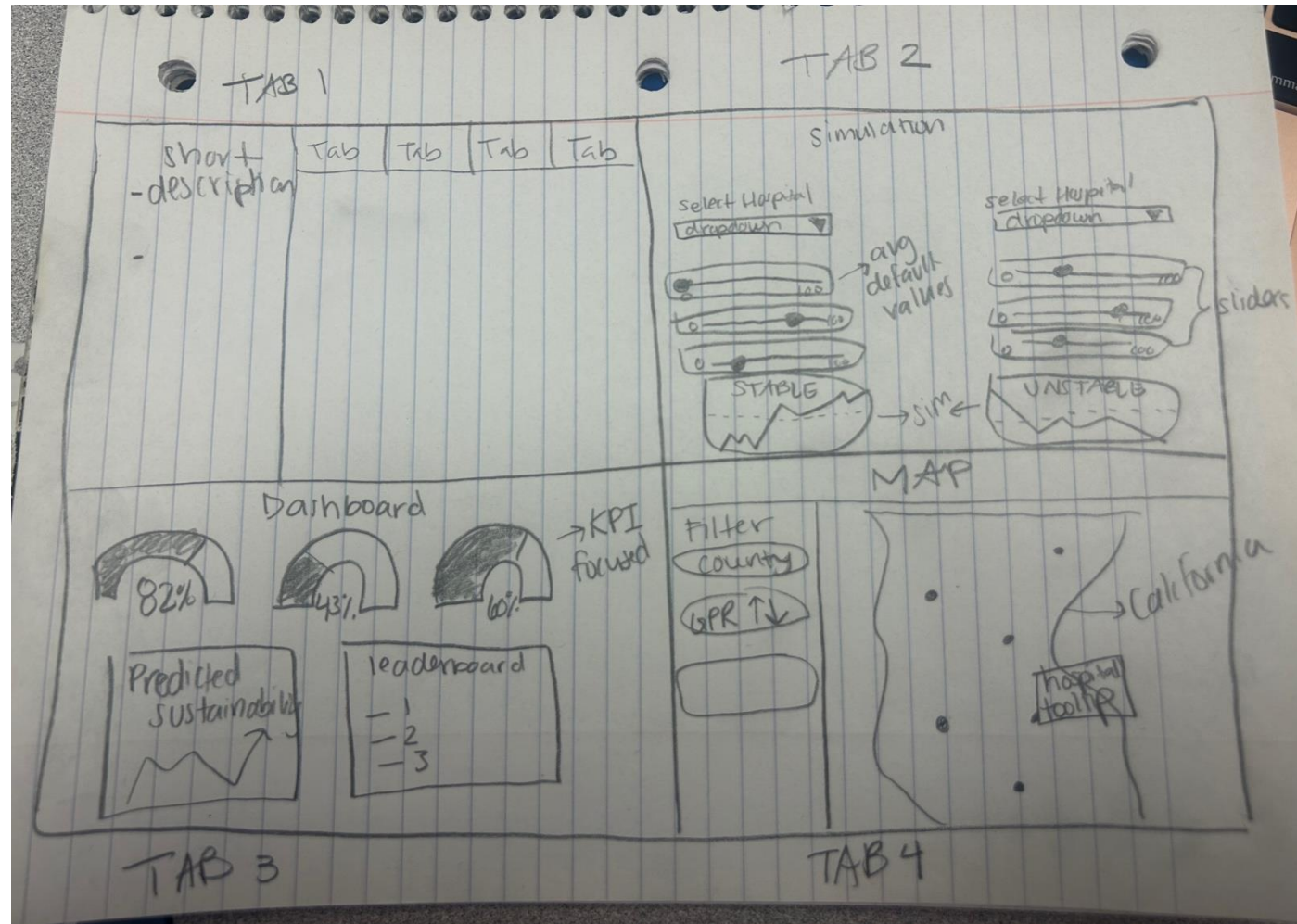
HCD: Ideate

- Gather the collective perspectives and strengths from roleplaying scenarios
- Step beyond obvious solutions and drive innovations in “Flare” and “Focused” statements
- Generate “How Might We” questions and detailed scenarios of application

Focus Statements	Flare Statements
<ul style="list-style-type: none">• How might we visualize financial risk zones in hospital operations to support proactive leadership?• How might we display the problems to prove to the hospital leaders that there are problems?	<ul style="list-style-type: none">• How might we identify any problems or bottlenecks patients have before they affect hospital GPR streams?• How might we highlight trends in patient experience to improve staff training programs?

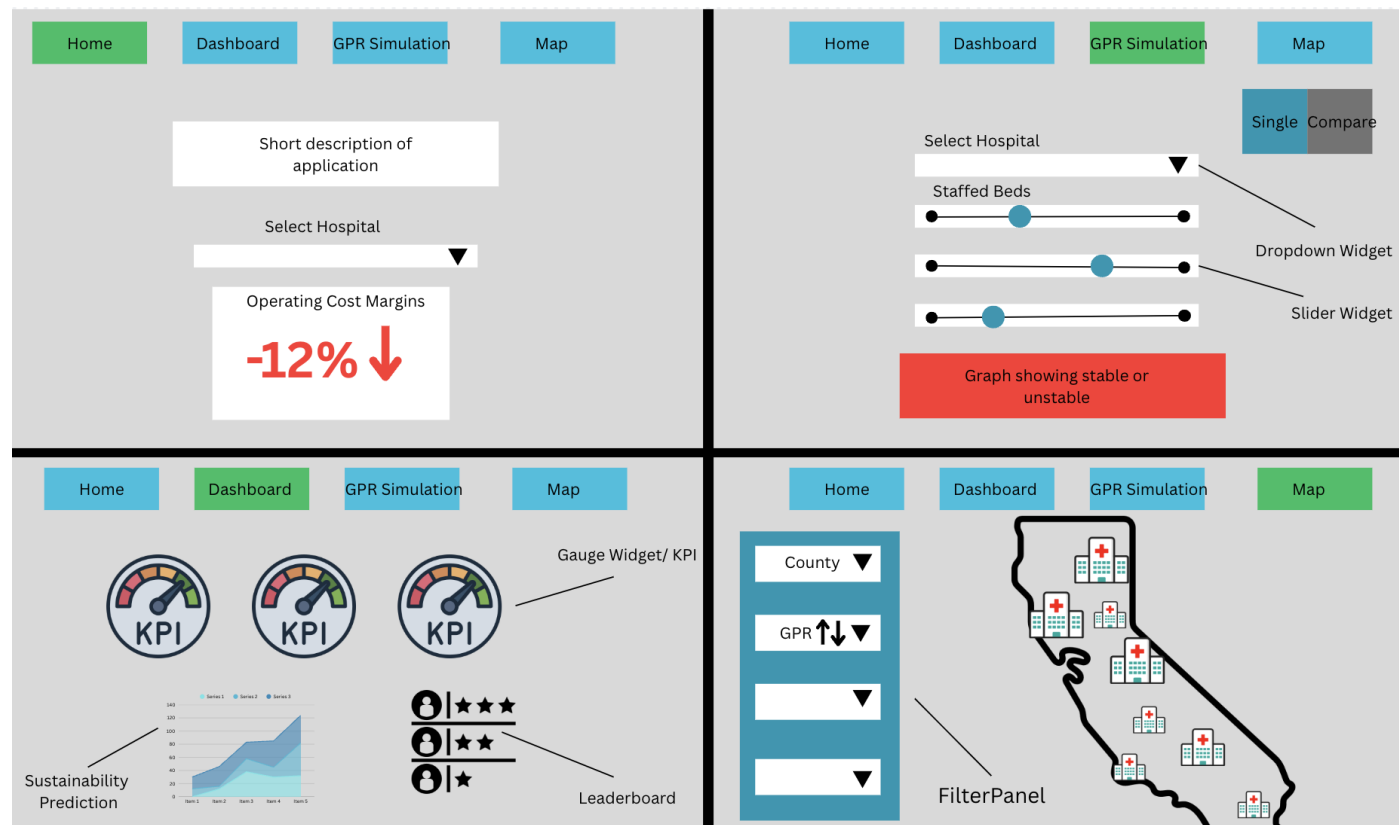


HCD: Prototyping



Paper Prototype

- Identify app users
- Prototypes for empathy
- User-centric design
- Roleplay users: refine the design based on real user needs



User-Driven Roleplay

- Understand pain points in chaotic, high-stakes environments
- Prioritize clarity, speed, and ease of use
- Focus on user selection elements and short, succinct information
- Reduce complexity and unneeded elements

HCD: Testing

Strong Features

- KPI Gauges
- Slider features – user input
- Separated tabs
- Distinctive icons

Critiques

- Start with the description - Home tab
- Tab 4 Map – color code hospitals
- More stats/info at beginning of app

Questions

- Are there opportunities to store past hospital data and history, or create a data storage method for new inputs?
- Could there be a hover ability feature to hover over each hospital by heatmap colors?

New Ideas

- Layman's term description
- Widget for single/comparison in simulation
- Color code GPR profit gain/loss (R/G)
- Filter reset button

Alternative Approaches



Profile selection:
Hospital Operations
vs. Nursing Staff



Historical data
trends to
provide time
series insights



Data storage
system to track user
selections and
outcomes over time

Conclusion



**Boosts hospital
financial
sustainability**



**Strengthen
Healthcare
Access**



**Drives informed
actionable
decisions**

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