

SpaceMed Case Study

Developing a Bed Expansion Plan When There Is a Deficit of Private Rooms



Originally printed in the
SpaceMed Newsletter
Spring 2009

Background

Prudent Hospital (PH) was originally designed to accommodate 250 licensed beds of which only 60 percent are in private patient rooms (150 beds). The remaining 100 beds are located in semiprivate rooms resulting in a total of 200 actual rooms (150 privates and 50 semiprivates). The current average daily census is 205 inpatients resulting in an average occupancy of 82 percent. The occupancy rate, however, is misleading because PH rarely places more than one patient per room in the two oldest nursing units — each with 30 semiprivate rooms. Because of concerns with patient privacy, infection control and medical errors, along with undersized semiprivate patient rooms, PH leadership wanted to develop a bed expansion and replacement plan to address inpatient demand through the year 2020.

PH has experienced fluctuation in demand for inpatient beds over the past several decades. Beginning in 1980, with pressures from payers, both the rate of admission and length of stay dropped resulting in a rapid decline in inpatient utilization over the subsequent decade. The downward trend in inpatient workloads began moderating in the mid-1990s as a backlash to managed care. In a complete reversal of the trends of the early 1990s, PH experienced increased demand for inpatient care over the past few years. However, with the recent downturn in the economy, PH leadership is unsure of how to proceed.

Although some bed replacement and expansion was deemed necessary by all members of the planning team, the CFO was concerned about spending significant capital dollars given current economic conditions. PH executives were also not in agreement regarding the extent of the required expansion — some wanted to plan for 100 percent private rooms while others were concerned that significant expansion would require additional staff at a time when budgets were tight and recruiting was difficult. Others were concerned about losing admissions to competitor hospitals who had more contemporary patient accommodations. Declining length of stay was also a concern. However, everyone agreed that the current use rate (admissions per 1,000 population) would most likely remain constant. They also agreed that the county's updated population forecast for 2020 was reasonable given that it was much lower than previous estimates.

Planning Approach

The PH executive team was not interested in projecting the need for an absolute number of beds at some future date. Instead, PH wanted to identify the range of beds required based on the most optimistic versus pessimistic view of future market conditions — particularly since decisions to expand or replace their inpatient facilities would start a chain reaction of events and involve a long-range commitment of dollars, staff time, and operational disruption.

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All members of the planning team agreed that a sensitivity analysis was needed to model the impact of different planning assumptions on future bed need and to evaluate the magnitude of renovation or construction. They also wanted to look at the relationship between high-bed need and low-bed need scenarios and the resulting number of private patient rooms that could be available.

As shown in the table on the following page, different scenarios were modeled based on varying market share, length of stay, and occupancy rate assumptions with the use rate and projected service area population held constant as follows:

- **Population.** A population increase of nine percent was projected in all scenarios. The medium bed need scenario reflects the status quo relative to all other variables.
- **Use rate.** The use rate was projected to remain constant in all scenarios at 110.5 admissions per 1,000 population in PH's service area.
- **Hospital market share.** PH's market share was projected to decrease by five percent in the low-bed need scenario and increase by 10 percent in the high-bed need scenario.
- **Hospital admissions.** PH's admissions were calculated by applying the use rate to the projected service area population and multiplying by PH's expected market share.
- **Average length of stay.** PH's current average length of stay (LOS) was reduced by one-half day in the low-bed need scenario and maintained in the high-bed need scenario.
- **Average daily census.** The expected average daily patient census for PH was calculated by multiplying the projected admissions by the length of stay and dividing by 365 days.
- **Bed Need.** PH's projected bed need for 2020 was calculated based on varying occupancy levels.

The target occupancy rate was also an issue for PH. The hospital typically used 80 percent occupancy as a target. However, PH realized that organizations with all private patient rooms are re-evaluating this target. Given the high cost of construction and planning uncertainties, PH's CFO was willing to accept the risk of not accommodating all demand during peak periods to avoid having vacant patient rooms during average census periods. The Director of Planning noted that, statistically, a hospital with all private patient rooms should be able to maintain a higher occupancy level than one with a large number of semiprivate or multiple-bed rooms. On the other hand, targeting a higher occupancy level would not be practical for PH if it maintained its current high percentage of semiprivate patient rooms. PH decided to use a target of 85 percent occupancy assuming that it needed to increase the number of private patient rooms regardless.

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The PH leadership team had the following observations regarding the 2020 bed need projections:

- The nine percent increase in population alone (all scenarios) results in the need for an additional 12 beds (total of 262 beds at 85 percent occupancy).
- In the high-bed need scenario, a 10 percent increase in market share results in the need for an additional 39 beds (total of 289 beds at 85 percent occupancy).
- In the low-bed need scenario, with both the market share and length of stay reduced, 24 less beds would be needed (total of 226 beds at 85 percent occupancy).
- Assuming a lower occupancy target of 80 percent versus 85 percent results in the need for 14 to 18 more beds depending on the scenario; assuming a higher occupancy rate of 90 percent versus 85 percent results in the need for 12 to 16 fewer beds.

	Current	Low Bed Need (Declining Market Share and LOS)	Medium Bed Need (Status Quo With Population Increase Only)	High Bed Need (Increased Market Share Only)
Service Area Population	445,030	485,000	485,000	485,000
Use Rate (Admissions/1,000)	110.5	110.5	110.5	110.5
Hospital Market Share	27.6%	26.2%	27.6%	30.4%
Hospital Admissions	13,573	14,041	14,792	16,292
Length of Stay (LOS)	5.50	5.00	5.50	5.50
Average Daily Census	205	192	223	245
Bed Need At:				
90% Occupancy		214	248	273
85% Occupancy		226	262	289
80% Occupancy		240	279	307
Current Bed Capacity	250	250	250	250
Range of Bed Need		-36 to -10	-2 to +29	+23 to +57

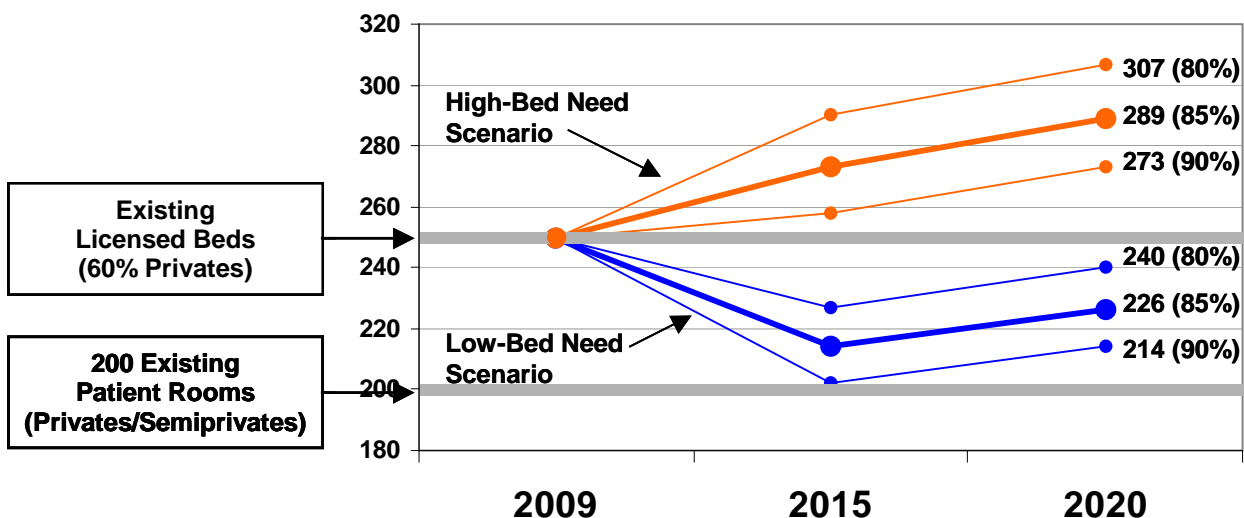
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Analysis

The graph below displays the high-bed need and low-bed need scenarios projected through 2020 with varying occupancy assumptions. The hospital's existing licensed capacity of 250 beds is also shown along with the existing number of patient rooms — regardless of whether some were originally designed to accommodate two patients.



Low-bed need scenario. Since this facility was originally designed with a total of 200 patient rooms (150 privates and 50 semiprivates), in the low-bed need scenario PH could essentially use all the patient rooms as privates during the average daily census (192 patients) while retaining a limited number of semiprivate rooms to accommodate peak census periods and maintain its current licensure. No expansion would be necessary through 2020 unless PH desired to upgrade or replace some of the existing patient rooms — enlarge the patient rooms and provide wheelchair accessible toilet/shower rooms and additional amenities.

High-bed scenario. Bed expansion would definitely be required in the high-bed scenario to accommodate the 2020 bed need. If the high-bed need scenario comes to fruition, PH considered the following possible bed expansion strategies:

- Conservative approach — construct 40 additional private patient rooms thus increasing the proportion of private patient rooms to 66 percent.
- Aggressive approach — construct 90 additional private patient rooms resulting in 100 percent of the projected beds for 2020 in private rooms.

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Conclusion

The PH executive team recognized that even though the low-bed need scenario resulted in less beds than were currently licensed, PH was effectively only using 220 beds rather than 250. All of the 60 semiprivate patient rooms in the two oldest nursing units were too small to accommodate two patients given the amount of equipment and technology used today to deliver inpatient care. They decided that even in the low-bed need scenario, they still needed to replace at least 30 beds. This would result in a total of 230 patient rooms that could all be used as privates if the low-bed need scenario occurs — assuming that the resulting number of beds per nursing unit did not compromise staffing efficiencies.

The PH executive team agreed on the goal of having enough patient rooms to accommodate the 2020 projected average daily census of 245 patients (high-bed scenario). The existing semiprivate patient rooms would be maintained and deployed during high census periods if the high bed need scenario evolves.

Ultimately, PH developed a plan to construct 72 new beds, all in private rooms. The remaining 20 semiprivate patient rooms would be maintained to accommodate peak census periods. Depending on the future bed scenario that evolves, the two oldest nursing units could be redeployed for same-day/observation patients, although the beds could still be used as overflow inpatient beds at some point if necessary. With the existing 150 private patient rooms, 30 converted private rooms (existing semiprivates), 72 new private patient rooms, and 20 remaining semiprivate patient rooms, PH could expand its licensure to 292 beds to accommodate the high bed need scenario for 2020 if needed. If this scenario does not come to fruition, the oldest nursing units could be permanently decommissioned for an alternative use and all the remaining semiprivate patient rooms could be converted for single-patient use. This would result in a total of 242 private patient rooms.

Like many hospitals, PH was challenged with planning a staged conversion of semiprivate patient rooms to privates over time. However, they hoped to plan for additional flexibility that could offset forecasting inaccuracies. If the low-bed need scenario plays out, then some of the existing semiprivate patient rooms could be used for single occupancy. On the other hand, if the high-bed need scenario comes to fruition, then PH would need to deploy some of the rooms as semiprivates during peak census periods.

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[SpaceMed Case Study 1309.06.1](#)