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# Measuring Hospital Savings/Waste

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## Introduction

As part of its ongoing health care research and consulting activities, Axene Health Partners, LLC (i.e., AHP) periodically publishes reports describing the general hospital risk outlook for hospitals by State. These reports attempt to quantify the potential savings/waste in the system as well as relative performance between peer hospitals. These reports compare relative performance to each hospital as well as overall savings by hospital. This same analysis can be completed for individual hospitals using a hospital's own data to help a hospital or health system understand their own efficiency and potential for cost savings.

As health care costs continue to escalate faster than general inflation, there is considerable concern about the affordability of the nation's health care system. Health care reform (i.e., ACA) was formally introduced in 2014 in response to this.

Various initiatives continue to control and moderate the growth of the health care sector, but until inpatient hospital costs are effectively controlled, inflation will continue to accelerate. The hospital sector, especially the inpatient hospital sector continues to be an area of concern. This report will focus on how to calculate and compare potential savings in the hospital inpatient category. Some examples will be shown from the California specific report that was produced in the fall of 2015 based upon CY2014 data.

Our firm's consulting projects have demonstrated for many years that about two-thirds (i.e., 2/3rds) of what can be saved in today's overall health care system directly relates to hospital inpatient care. The 2015 report referenced in this document as well as others clearly show significant opportunities for savings in the inpatient setting.

## Methodology

AHP's hospital savings analyses have been prepared using detailed hospital discharge information from publicly available sources. For instance, in the state of California the Office of Statewide Health Planning and Development (i.e., OSHPD) discharge files were compared to proprietary benchmarks developed by AHP in its AHP Best Practice Norms™ database. Analysis was done comparing the length of stay, gross and net charges, scope of services, complexity and severity of care. As these metrics are properly reflected, the analysis projects both potentially avoidable days and potentially avoidable health care cost.

It would be ideal to have complete claims data including discounts from each hospital for individual payers to complete this analysis, but it is not realistic to think that this is possible due to the competitive and proprietary nature of the business.

When doing this type of statewide analysis, it is imperative to consider the types of hospitals to be analyzed and the scope of services provided by each hospital. We have limited our analysis to General Acute Care Hospitals and have excluded psychiatric and recovery hospitals that would have extremely different lengths of stay than most acute care hospitals. Depending on the location the analysis is done for, it might also be best to exclude large health plans with their own hospitals such as Kaiser where complete data might not have been included in the public files. In order to reduce some of the fluctuation it is also common to set a minimum discharge threshold (e.g., at least 600 annual discharges).

## Measurement Metrics

When comparing hospitals and their potential available savings there are at least nine primary metrics that should be included in the

analysis. Each of these metrics allows for easy comparisons between hospitals and also the state in which they reside. The example table shown below (table 1.0) is from the California analysis completed by AHP in November 2015.

- **Gross Billed Charges/Day:** This is calculated as gross billed charges divided by the number of days. This is the amount reported by each hospital as billed for every day (i.e., from charge-master).
- **Projected Net Charges/Day:** Net charges is not always available in the data, but can be estimated by either normative discount information or possibly from other published reports by state. For example, in California, net charges were calculated from the gross billed charges by "line of business" (i.e., Commercial, Medicaid, Medicare, and Other) using information provided by OSHPD in other public reports. The composite for the hospital was based upon the distribution of stays shown in Table 1.0. This is the net revenue received by the hospital per day.
- **RVU Adjusted Charges/Day:** Using the proprietary AHP RVU/Day factors, the actual Gross Billed and Projected Net Charges per day were normalized to a standard by dividing the charges/day by the composite AHP RVU/Day factor. This is calculated at the discharge level and aggregated based upon the hospital's actual discharge distribution.
- **Actual ALOS:** average length of stay reported at the hospital
- **Ideal ALOS:** ideal average length of stay for the hospital based upon their actual mix of discharges by MS-DRG or APR-DRG.
- **Avoidable Days/Discharge:** Estimated avoidable days/discharge at the hospital based upon actual performance at that hospital. As the footnote in the table 1.0 describes, these days exclude any stay where the actual ALOS was less than the ideal ALOS (i.e., negative potential savings).

Table 1.0

STATEWIDE	Hospital - STATEWIDE				
	Commercial	Medi-Cal	Medicare	Other	Total
Total Discharges	717,637	921,510	836,559	181,013	2,656,719
Total Days	2,429,982	3,520,159	3,974,990	695,822	10,620,953
Total Gross Billed Charges (\$ millions)	\$40,543.9	\$43,459.1	\$70,385.9	\$11,337.7	\$165,726.5
Total Projected Net Charges (\$ millions)	\$14,797.4	\$10,641.8	\$12,264.7	\$1,362.5	\$39,066.4
Gross Billed Charges / Day	\$16,685	\$12,346	\$17,707	\$16,294	\$15,604
Projected Net Charges/Day	\$6,089	\$3,023	\$3,085	\$1,958	\$3,678
RVU Adjusted Total Gross Billed Charges (\$ millions)	\$40,997.7	\$52,611.9	\$66,367.3	\$11,767.5	\$171,744.4
RVU Adjusted Total Projected Net Charges (\$ millions)	\$15,014.9	\$12,947.5	\$11,643.7	\$1,383.3	\$40,989.4
RVU Adjusted Gross Billed Charges / Day	\$16,872	\$14,946	\$16,696	\$16,912	\$16,170
RVU Adjusted Projected Net Charges/Day	\$6,179	\$3,678	\$2,929	\$1,988	\$3,859
Reported ALOS	160%	95%	76%	52%	100%
Ideal ALOS	3.39	3.82	4.75	3.84	4.00
Available Days/Discharge <sup>1</sup>	2.33	2.39	3.27	2.56	2.66
	1.38	1.75	1.93	1.68	1.70
<b>Distribution of Stays by Acuity/Severity</b>					
N	68.59%	65.27%	42.92%	67.57%	59.28%
CC	13.87%	14.43%	24.43%	14.41%	17.43%
MCC	13.53%	16.46%	31.16%	14.80%	20.19%
CC/MCC	4.00%	3.84%	1.48%	3.21%	3.10%
Total	100.00%	100.00%	100.00%	100.00%	100.00%
<b>Severity Factor</b>					
Ideal	1.529	1.589	1.912	1.536	1.671
Ratio to Ideal	100%	104%	125%	101%	109%
<b>Statewide</b>					
Ratio to Statewide	100%	100%	100%	100%	100%
Potential Savings (\$ millions) <sup>2</sup>	\$3,286.4	\$2,913.0	\$2,819.8	\$337.4	\$9,356.5
Potential Savings (% of Proj. Net Charges)	22.2%	27.4%	23.0%	24.8%	24.0%
RVU Adjusted Potential Savings (\$ millions) <sup>2</sup>	\$3,673.2	\$3,592.7	\$2,732.7	\$361.1	\$10,359.6
RVU Adjusted Potential Savings (% of Proj. Net Charges)	24.5%	27.7%	23.5%	26.1%	25.3%

	Weight
N	68.3%
CC	14.8%
MCC	12.7%
CC/MCC	4.2%
	100.0%

- Distribution by acuity/severity: Discharges are categorized into one of four categories when using the MS-DRG coding system:
  - ◊ **N:** No complications or comorbidities, consistent with what might be called the “uncomplicated patient” (i.e., 59.28%)
  - ◊ **CC:** Patients with complications and comorbidities (i.e., 17.43%)
  - ◊ **MCC:** Patients with major complications and comorbidities (i.e., 20.19%)
  - ◊ **CC/MCC:** Patients with complications and comorbidities and major complications and comorbidities (i.e., 3.10%)

When using APR-DRGs a similar categorization is used based upon the acuity/severity categories labeled 1 – 4.

The AHP Benchmark data is shown below. When looking at the above table showing California data and comparing to the norms below, there are fewer of the California statewide discharges that are being coded “N” than expected (59.28% vs. 68.3%). Overall there were more discharges coded as “CC” and “MCC” than expected and fewer with the “CC/MCC” designation (3.1% vs. 4.2%)

- **Severity:** Using the distribution of stays by the various severity categories we have derived a severity metric for comparison to AHP norms. This is based upon a simple approach where each of the categories is assigned a number from 1 to 4 with the average calculated based upon the actual distribution of discharges by category. We calculate a ratio of actual severity metric to the benchmark severity metric.

For the California statewide results shown above, we found that the coded ratio is 109% of the benchmark/ideal ratio. Some of this is the result of coding, some is a difference in actual patient severity.

- **Potential Savings:** We developed an estimate of potential savings assuming actual stays could achieve the ideal performance level. The potential savings is calculated as the product of the following items:
  - ◊ Savings Factor: 65%
  - ◊ Avoidable Days/Discharge

Projected Net Charges per day

The product of these three items is the Projected Savings in Dollars. For convenience we also calculated this as a percentage of Total Projected Net Charges.

The California statewide results showed 24.0% potential savings. This suggests that there is significant potential to reduce California statewide hospital costs. When this estimate is RVU adjusted the projected savings increased to about 25% of Total Projected Net Charges.

## Potential savings

When looking at potential savings and or waste in the health care system it is important to remember that there is high statistical fluctuation found in hospitals / medical data. There are variables in the healthcare system that are not fully quantifiable and thus potential savings is not guaranteed savings.

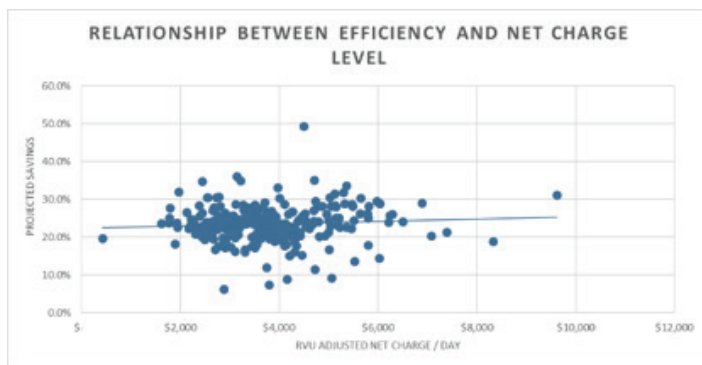
The results presented in table 1.0 suggest that statewide, California

hospital inpatient costs can be reduced by about 25%. Our client experiences have shown that the hospital inpatient savings potential represents about two-thirds of what can be saved in the total system. For the California hospitals that were studied in Table 1.0, this analysis shows a potential projected savings of \$10.4 billion. Based upon the assumption that two-thirds of the savings is normally found in inpatient, this would suggest that there is a reasonable opportunity to save at least \$15.6 billion from the California health care system, a significant opportunity.

## Correlation Between Hospital Efficiency and Net Charge Levels

When completing an analysis like this, it is also interesting to compare individual hospital efficiency with its net charge levels (i.e., on a per day basis) to determine whether or not there was any correlation between cost and efficiency. Chart 2.0 shows that there is only a very minor correlation in these variables. The regression line suggests only slightly greater efficiency for lower cost levels. Therefore, higher net charges per day were not directly associated with obviously inefficient systems.

Table 2.0



## Hospital Rank Groupings (Filters)

The above methodology can be used to create a dashboard for each hospital in the analysis. Results can be reviewed and compared on a hospital by hospital basis. However, it should be noted that due to many complex variables it is best to compare hospitals with certain filters.

- The most obvious comparison is at the statewide level. Not only is data often collected at the state level, but also regulations and practices by state can vary widely should be looked at no larger than the state level. Statewide results are also important for comparison purposes for any of the below filters.

- The next comparison could be by Area or Region. For example, it could be done by:
  - ◊ 3-digit zip codes,
  - ◊ Metropolitan Statistical Area (MSA)
  - ◊ ACA Exchange Rating Areas

The purpose of this analysis is to determine whether or not there is any significant regional variation in efficiency.

- Another comparison could be by bed size range. This way you are comparing hospitals to its peers based on the relative size of the actual institution. In California we used eight size categories. With the large population in California there were more hospitals and the analysis justified a larger number of bed size categories.

It has been the general consensus of experts in the industry that larger hospitals often have improved performance. It was interesting to note that the California analysis showed no strong correlation of size of the hospital and increased efficiency.

- Another comparison might be by Control type. We used three control types:
  - ◊ For Profit
  - ◊ Non-Profit
  - ◊ Public

It might be assumed that there could be meaningful differences by control type suggesting that their governance model, corporate structure and related incentives might have different goals and outcomes.

- The most refined comparison might be at each hospital individually. When looking at individual hospitals it is important to remember that the hospital's specialty, location, size, and payor mix can drastically affect outcomes.
- Other groupings are possible, such as looking at each payer across the state, but the above ones are the filters/groupings we have found the most attention-grabbing.

## Final Conclusions

There is significant evidence that hospital inpatient costs can be significantly reduced by improved inpatient inefficiency. (e.g., California could save about \$10 billion for the 275 hospitals included in this included study.)

The greatest percentage efficiency improvement opportunity in most states will most likely be in the Medicaid line of business, while the

greatest potential dollar savings is will most likely be found in the commercial line of business.

Cost shifting will be very apparent when doing this type of analysis. For example, in California on a case normalized basis, commercial carriers pay 60% more for care than the average. Medi-Cal payers pay 95% of the average. Medicare pays 76% of the average.

When doing statewide hospital analysis based on publically available data there needs to be a small caveat that this data is not always complete and in full detail. Although an analysis like this carefully reviews the key variables available in publically available data files, it has not explicitly considered detailed clinical information available to the attending physician and other health care providers involved in the care. Also, the norms used to assess the relative efficiency of care need to be carefully developed and analyzed. In the case of AHP, these norms have been developed from more than 35 years of active consulting to the hospital industry and the detailed clinical review of more than 10,000 individual medical charts. No matter how thorough this analysis is, there are always exceptions to the findings.

All example statistics in this report are based on the full California Hospital Risk Outlook paper published by Axene Health Partners in the fall of 2015. A copy of this report is located at [www.axenehp.com](http://www.axenehp.com) or can be requested at the address below.

### **About the Author:**

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