

Exercise #1:

The attached dataset, provides some information about hospitals in 2011 and 2012, download the data and then complete the descriptive table. Please use the following format to report your findings.

Table 1. Descriptive statistics between hospitals in 2011 & 2012

Hospital Characteristics	2011			2012			p-value
	N	Mean	St. Dev	N	Mean	St. Dev	
1. Hospital beds							
2. Number of paid Employee							
3. Number of non-paid Employee							
4. Total hospital cost							
5. Total hospital revenues							
6. Available Medicare days							
7. Available Medicaid days							
8. Total Hospital Discharge							
9. Medicare discharge							
10. Medicaid discharge							

Based on your findings in which years hospitals had better performance? Please write a short paragraph and describe your findings.

(Note: Master RStudio script is available for this exercise, but you may need to modify that for this analysis)

Exercise #2:

Use the dataset from week1 exercise and then answer the following questions:

- 1) Compare the following information between teaching and non-teaching hospitals.
- 2) What are the main significant differences between teaching and non-teaching hospitals? (use ttest)
- 3) Comparing hospital net-benefit which hospitals has better performance? To answer this question first compute the hospital net benefits with subtracting hospital costs and revenues and then use ttest to compare the significant differences between teaching and non-teaching hospitals.
- 4) Use a box-plot and compare hospitals-cost and hospital-revenues between teaching and non-teaching hospitals.
- 5) Write a short paragraph and describe your findings.

Table 2. Descriptive statistics between teaching and non-teaching hospitals, 2011 & 2012

Hospital Characteristics	Teaching			Non-Teaching			p-value
	N	Mean	St. Dev	N	Mean	St. Dev	
1. Hospital beds							
2. Number of paid Employee							
3. Number of non-paid Employee							
4. Internes and Residents							
5. System Membership							
6. Total hospital cost							
7. Total hospital revenues							
8. Hospital net benefit							
9. Available Medicare days							
10. Available Medicaid days							
11. Total Hospital Discharge							
12. Medicare discharge							
13. Medicaid discharge							

(Note: Master RStudio script is available for this exercise, but you may need to modify that for this analysis)

Exercise #3:

The dataset provides Herfindahl–Hirschman Index, and herfindahel index categories, please use the herf_cat variable and answer the following questions:

Note: “The Herfindahl–Hirschman Index is a commonly accepted measure of market concentration used by antitrust enforcement agencies and scholars in the field. The HHI is calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers” (NASI, 2015; pp: 14-16). read more from here:

<https://www.urban.org/sites/default/files/publication/50116/2000212-Addressing-Pricing-Power-in-Health-Care-Markets.pdf>

For this exercise you do not need to compute the HHI, but if you have any questions, please do not hesitate to ask me, but try to learn more about this you will need that to report your findings.

Use the dataset from week1 exercise and then answer the following questions:

- 1) Compare the following information between hospitals located in high, moderate and low competitive markets? (table 1)
- 2) What are the main significant differences between hospitals in different markets? (use Anova test)
- 3) Use the density curves and compare hospitals cost and revenues between three markets.
- 4) What is the impact of being in high-competitive market on hospital revenues and cost? Do you think being in high-competitive market has positive impact on net hospital benefits? What about the number of Medicare and Medicaid discharge? Do you think hospitals in higher competitive market more likely to accept more Medicare and Medicaid patients? What are the impact of other variables? Please discuss your findings in 1-2 paragraphs.

(Note: to answer to the last question, please compute the ratio-Medicare-discharge and ratio-Medicaid-discharge first and then run 2 ttest) high vs. moderate and high vs. low competitive market), please support your findings with box-plot).

Table 3. Comparing hospital characteristics and market, 2011 and 2012

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6. Total hospital cost										
7. Total hospital revenues										
8. Hospital net benefit										
9. Available Medicare days										
10. Available Medicaid days										
11. Total Hospital Discharge										
12. Medicare discharge										
13. Medicaid discharge										
14. Herfindahel index										

(Note: Master RStudio script is available for this exercise, but you may need to modify that for this analysis)

Exercise #4

Linear Regression Model

If you have chosen to work with RStudio, please run the following model and complete the following tables.

1st Model:

Run a linear model and predict the difference between hospital beds (use the bed-tot) and hospital's ownership on hospital net-benefit? Discuss your finding, do you think having higher beds has positive impact on the hospital net benefit? What about the ownership?

Hospital Characteristics	Model 1a		
	Coef.	St. Err	
Hospital beds			
Ownership			
For Profit			
Non-for profit			
Other			
N			
R-Squared			

2nd Model:

Now, estimate the impact of being a member of a system on hospital net benefit? And discuss your finding (nor more than 2 lines)? Is it significant?

Hospital Characteristics	Model 2		
	Coef.	St. Err	
Hospital beds			
Ownership			
For Profit			
Non-for profit			
Other			
Membership			
System Membership			
N			
R-Squared			

3rd Model:

Now, include the ratio of ratio-Medicare-discharge and ratio-Medicaid-discharge in your model? How do you evaluate the impact of having higher Medicare and Medicaid patients on hospital revenues?

	Model 3		
Hospital Characteristics	Coef.	St. Err	
Hospital beds			
Ownership			
For Profit			
Non-for profit			
Other			
Membership			
System Membership			
Socio-Economic Characteristics			
Medicare discharge ratio			
Medicaid discharge ratio			
N			
R-Squared			

Based on your finding please recommend 3 policies to improve hospital performance, please make sure to use the final model for your recommendation.

Discuss your findings.

If you have chosen to work with Excel, please run above three models and complete the following tables.

Model 1:

Run a linear model and predict the difference between hospital beds (use the bed-tot) and hospital net-benefit in teaching hospitals?

Hospital Characteristics	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-1						
Hospital beds						
R Square						

Model 2:

Run a linear model and predict the difference between hospital beds (use the bed-tot) and hospital net-benefit in non-teaching hospitals?

Use the results from model 1 and model 2 and compare the results between teaching and non-teaching hospitals.

Hospital Characteristics	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-2						
Hospital beds						
R Square						

Model 3:

Now, include the ratio of ratio-Medicare-discharge and ratio-Medicaid-discharge in first model? How do you evaluate the impact of having higher Medicare and Medicaid patients on hospital net-benefit in teaching hospitals?

Hospital Characteristics	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-3						
Hospital beds						
ratio-Medicare-discharge						
ratio-Medicaid-discharge						
R Square						

Model 4:

Now, include the ratio of ratio-Medicare-discharge and ratio-Medicaid-discharge in first model? How do you evaluate the impact of having higher Medicare and Medicaid patients on hospital net-benefit in non-teaching hospitals?

Hospital Characteristics	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-4						
Hospital beds						
ratio-Medicare-discharge						
ratio-Medicaid-discharge						
R Square						

Based on your finding please recommend 3 policies to improve hospital performance, please make sure to use the final model for your recommendation.

Exercise #5

For this week exercise, we need to try a few logit models (see this link for more information: <https://stats.idre.ucla.edu/r/dae/logit-regression/>)

Model 1

Run a logit model and use being a member of network and find out its impact on hospital ownership and hospital beds? (Model 1)

Hospital Characteristics	Coef.	St. Err	p-value
Hospital beds			
Ownership			
For Profit			
Non-for profit			
Other			
N			
AIC			

Model 2

Now, include hospital income and report the Coeff.? (Model 2)

Hospital Characteristics	Coef.	St. Err	p-value
Hospital beds			
Ownership			
For Profit			
Non-for profit			
Other			
Hospital Income			
N			
AIC			

Model 3

Now, include the ratio of ratio-Medicare-discharge and ratio-Medicaid-discharge in your model? And keep all variables you used for models 1, 2 & 3 and discuss your findings? Do you recommend keeping membership for a hospital? Why or why not? (Model 3)

Hospital Characteristics	Coef.	St. Err	p-value
Hospital beds			
Ownership			
For Profit			
Non-for profit			
Other			
Hospital Income			
Medicare discharge ratio			
Medicaid discharge ratio			
N			
AIC			

Based on your finding please recommend 3 policies to improve hospital performance in FP, NFP hospitals, please make sure to use the final model for your recommendation.

If you have chosen to work with Excel, please run above three models and complete the following tables.

Model 1: Run a regression model and use being a member of network and find out its impact on hospital cost? (Model 1)

	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-1						
Hospital cost						
N						
R Square						

Model 2: For the 2nd model run a regression model and use being a member of network and find out its impact on hospital cost and hospital revenue? (Model 2)

	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-2						
Hospital cost						
Hospital Revenue						
N						
R Square						

Model 3: For the 3rd model run a regression model and use being a member of network and find out its impact on ratio-Medicare-discharge and ratio-Medicaid-discharge.

	Coef.	ST. ERR	T Stat	P-values	Lower 95%	Upper 95%
Model-3						
Hospital cost						
Hospital Revenue						
Medicare discharge ratio						
Medicaid discharge ratio						
N						
R Square						

Based on your finding please recommend 3 policies and discuss the impact of being on a network on hospital cost, hospital revenue and out its impact on ratio-Medicare-discharge and ratio-Medicaid-discharge. Do you recommend keeping membership for a hospital? Why or why not?