

Assessment and Evaluation of Breast Cancer Screening Rates and Mammograms

Mi'Amore Medical Center 2015-2017



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Data Visualization & Analysis

Transforming Healthcare Data into Actionable Insights

Case Study Focus:

Data Analysis • Data Visualization • Information Design • Insight Communication • Evidence-Based Decision Making

Portfolio Case Study

Exercise #1

Breast Cancer Screening Rates (by year / by hospital)

Story 1

Exercise 1	Exercise 2	Exercise 3	Exercise 4	Exercise 5 - 1	Exercise 5 - 2	Exercise 6
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	Year of Date		
	2015	2016	2017
Avg. Memorial Hospital B..	0.3558	0.5417	0.6775
Avg. Southern Hospital Gr..	0.7917	0.6008	0.4175

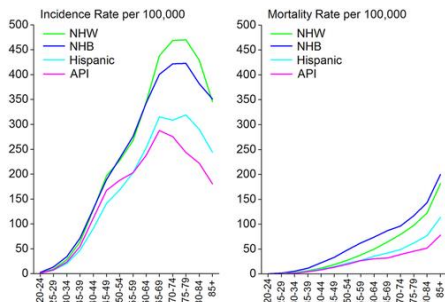
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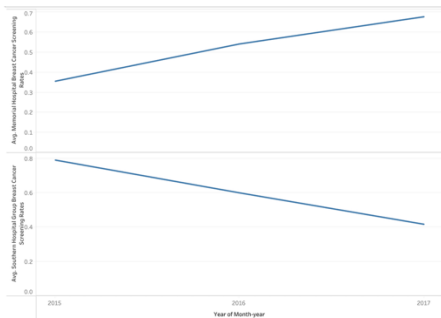
How Our Hospitals Compare to National Average

2017 Breast Cancer Screenings in the U.S.



(DeSantis et al., 2017)

2015-17 Breast Cancer Screenings at Mi'Amore



How does Mi'Amore compare to national average in 2017?

- National Average = 67.5%*
- Memorial = 67%
- Southern = 42%

* = Calculation per Average Women Ages 40-54

(DeSantis et al., 2017)



Exercise #2

Breast Cancer Costs (by year / by hospital)



Story 1

Exercise 1	Exercise 2	Exercise 3	Exercise 4	Exercise 5 - 1	Exercise 5 - 2	Exercise 6
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	Date		
	2015	2016	2017
Avg. Memorial Hospital Breast Cancer Costs	436,594	314,499	89,436
Avg. Southern Hospital Group Breast Cancer Costs	64,871	263,738	712,895

	Date		
	2015	2016	2017
Avg. Memorial Hospital Breast Cancer Costs	436,594	314,499	89,436
Avg. Southern Hospital Group Breast Cancer Costs	64,871	263,738	712,895





How Our Hospitals Compare to National Average

2017 μ Costs for Mammograms in the United States

- Range = \$113–714

(Kunst et al., 2021)

2017 μ Costs for Mammograms at Mi'Amore

- Average \$849*

How does Mi'Amore compare to national average in 2017?

- National Average = \$299*
- Memorial = \$189.48*
- Southern = \$1,510.37*

(Kunst et al., 2017)

* = Calculations using 472 monthly mammograms (2019 national average per hospital)
(Kunst et al., 2021)

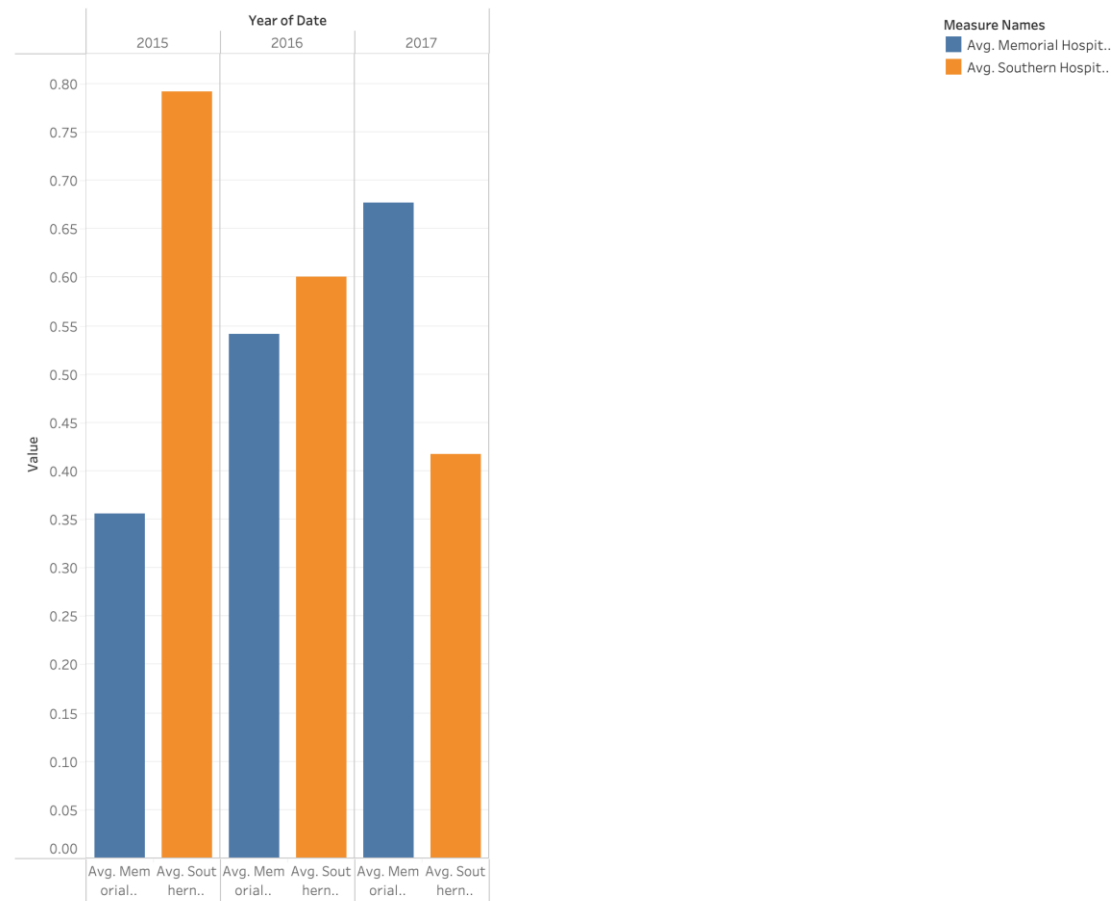


Exercise #3

Breast Cancer Screening Rates (by year / by hospital)

Story 1

Exercise 1	Exercise 2	Exercise 3	Exercise 4	Exercise 5 - 1	Exercise 5 - 2	Exercise 6
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Key	
	Memorial Hospital Group
	Southern Hospital Group



Mi'Amore Screening Rate Trends

Mi'Amore Memorial (Trending ▲)

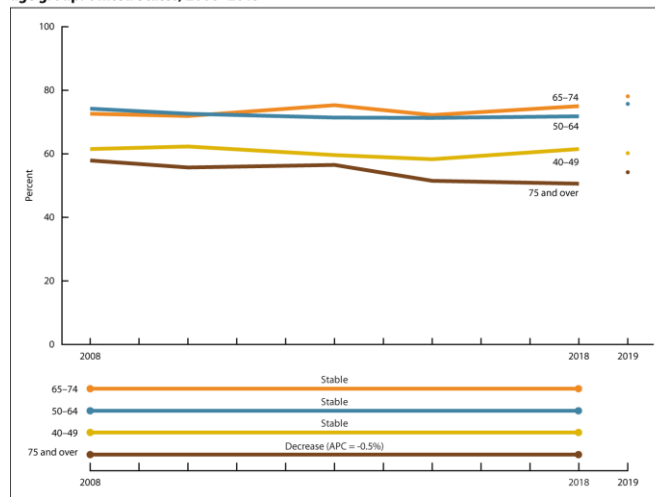
2015	2016	2017
35%	54%	68%

Mi'Amore Southern (Trending ▼)

2015	2016	2017
79%	60%	41%

National Trend – Flat

Figure 1. Use of mammography within the past 2 years among women aged 40 and over, by age group: United States, 2008–2019



(CDC.gov, n.d.)



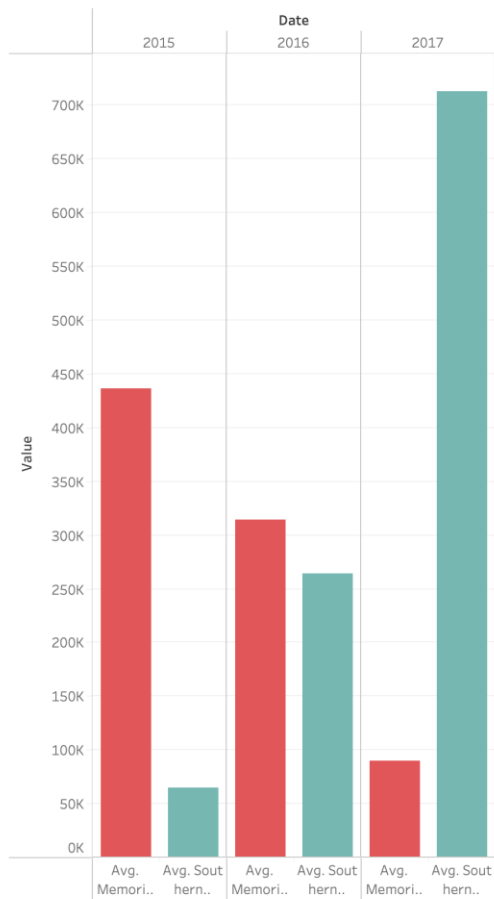
Exercise #4

Breast Cancer Costs (by year / by hospital)



Story 1

Exercise 1	Exercise 2	Exercise 3	Exercise 4	Exercise 5 - 1	Exercise 5 - 2	Exercise 6
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Measure Names

- Avg. Memorial Hospit..
- Avg. Southern Hospit..

Key	
	Memorial Hospital Group
	Southern Hospital Group





Mi'Amore Screening Cost Trends

Mi'Amore Memorial (Trending ▼)

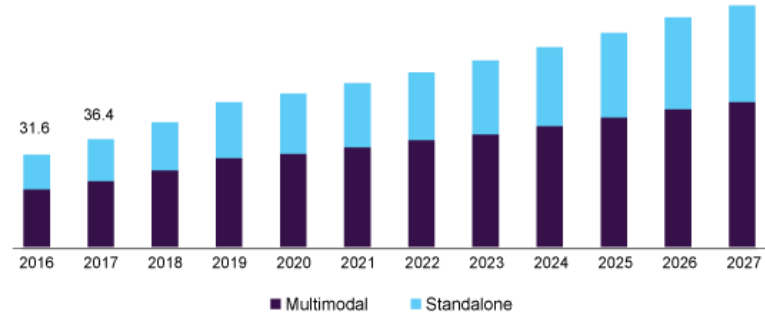
2015	2016	2017
\$436.6K	\$314.5K	\$89.4K

Mi'Amore Southern (Trending ▲)

2015	2016	2017
\$64.8K	\$263.7K	\$712.9K

National Costs (Trending ▲)

U.S. mammography workstation market size, by modality, 2016 - 2027 (USD Million)



(Grand View Research, n.d.)



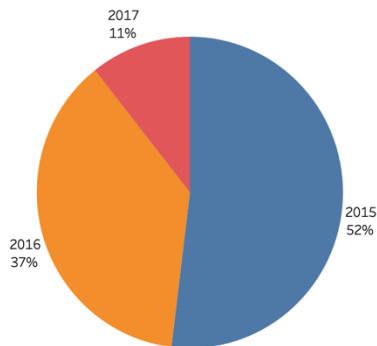
Exercise #5

% of Cancer Costs Contribution (2015-17)

Memorial Hospital Group

Story 1

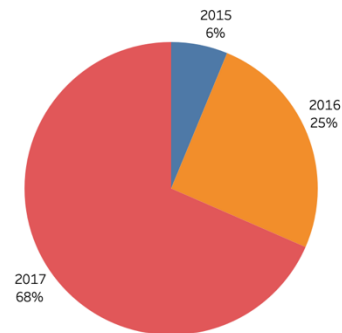
Exercise 2	Exercise 3	Exercise 4	Exercise 5 - 1	Exercise 5 - 2
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Southern Hospital Group

Story 1

Exercise 3	Exercise 4	Exercise 5 - 1	Exercise 5 - 2	Exercise 6
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Key

2015
2016
2017



Analysis of Costs

Memorial Hospital Group

2015 most costly
*trending **down** year-over-year*

Southern Hospital Group

2017 most costly
*trending **up** year-over-year*

Reasons for Cost Changes Year-Over-Year

- Changes in healthcare policies and regulations
- Variations in the cost of medical equipment and supplies
- Fluctuations in demand for screening services
- Differences in reimbursement rates from insurance companies
- Economic factors such as inflation
- Changes in healthcare funding can also contribute to cost fluctuations

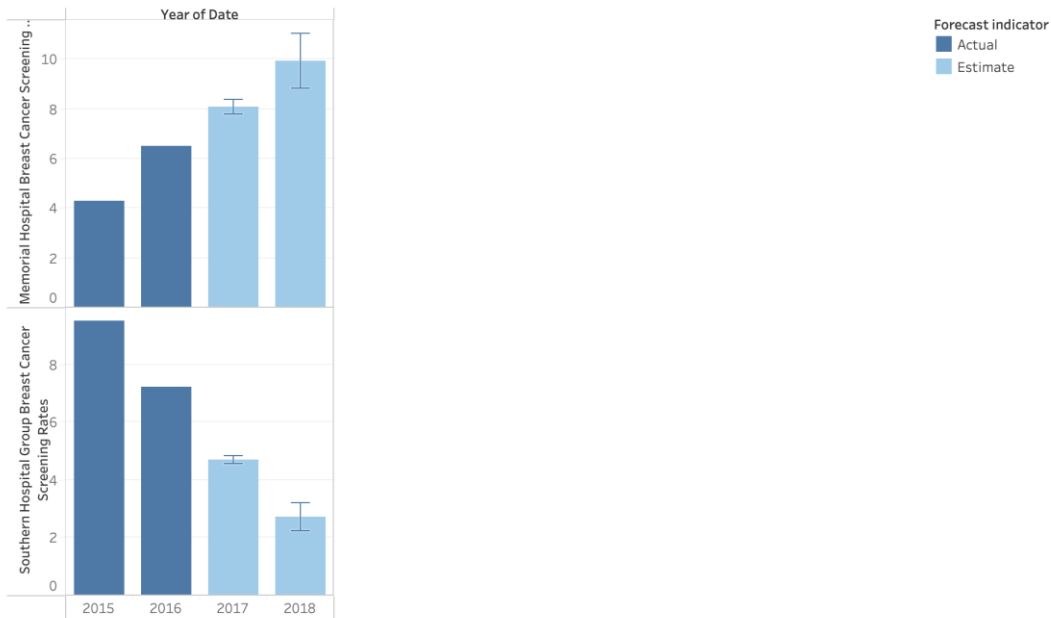
(Kunst et al., 2021)

Exercise #6

Forecast for Screening Rates

Story 1

Exercise 4	Exercise 5 - 1	Exercise 5 - 2	Exercise 6	Exercise 7	Exercise 8 - 1	Exercise 8 - 2
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Forecasting Trends

Memorial Hospital Group

*Trending **down** year-over-year*

Southern Hospital Group

*Trending **up** year-over-year*

Reasons for Up Trend

- Implemented targeted outreach and education programs to raise awareness about the importance of breast cancer screening
- Better screening facilities and equipment.
- Increased funding or support for breast cancer screening initiatives
- Increase in public awareness and understanding of the importance of breast cancer screening

Reasons for Down Trend

- Lack of patient education programs
- Better screening facilities and equipment at nearby hospital
- Decreased funding or support for breast cancer screening initiatives
- Less public awareness and understanding of the importance of breast cancer screening
- Lack of access to screenings due to socio economic reasons or lack of healthcare coverage

(Kunst et al., 2021)

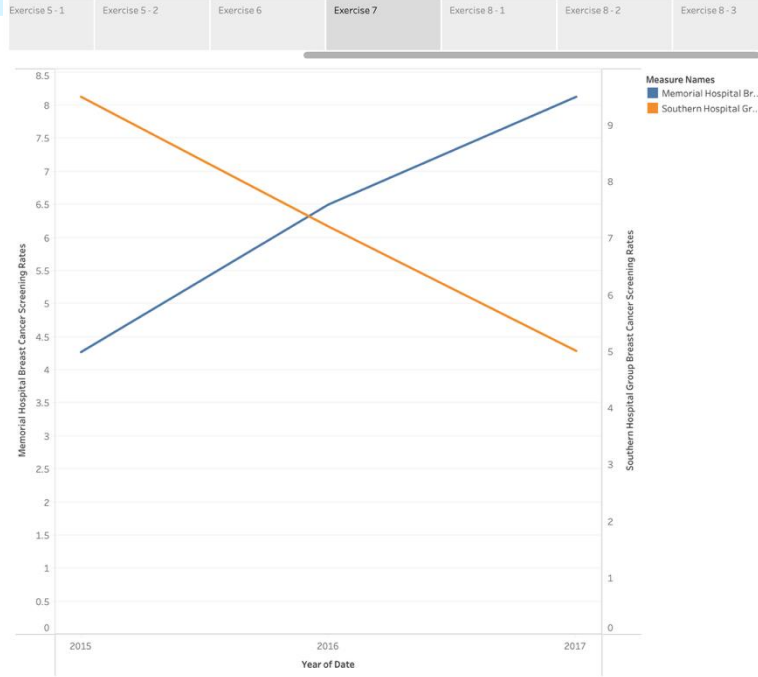
(Kunst et al., 2021)

Exercise #7

Need for Policy Change

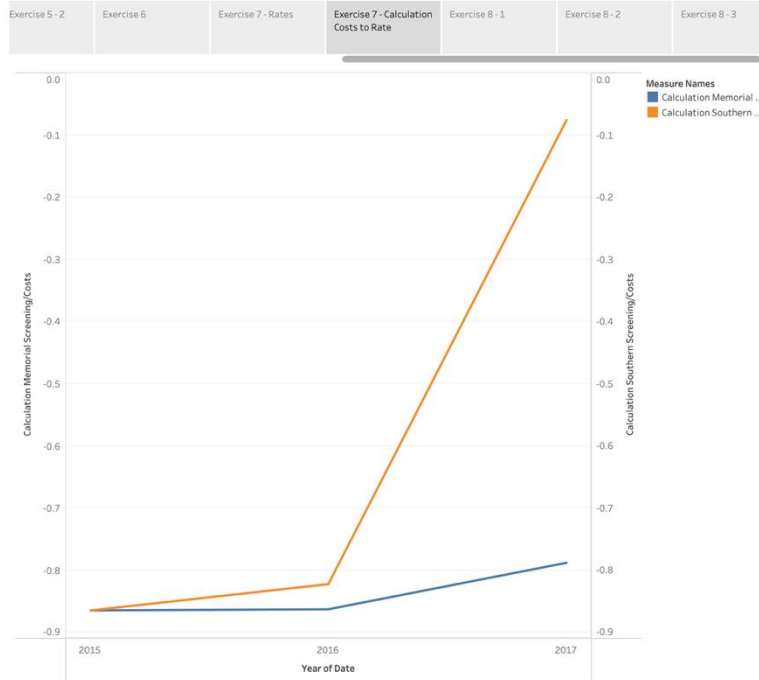
Screening Rates 2015 to 2017

Story 1



Calculation of Costs to Rates

Story 1



Policy Change

Memorial Hospital Group		Southern Hospital Group	
Increased screenings, maintaining costs		Decreased screenings, skyrocketing costs	
	No need to change breast cancer screenings policies		Immediate need to change breast cancer screenings policies

Why Breast Cancer Screening Policies Matter in Healthcare

Hospital policies for breast cancer screening and costs matter as this may have a direct impact to patient access to screenings and the overall cost of healthcare. Well-designed policies can ensure that screenings are accessible and affordable for patients, leading to early detection and improved outcomes. Poorly designed policies may create barriers to screenings, resulting in delayed diagnoses and potentially higher treatment costs in the long run. Hospital policies can also influence reimbursement rates from insurance companies and government programs, which can further affect the availability and affordability of screenings for patients.

(Heller & Moy, 2020)

Exercise #8

Compute Correlation to Examine Association Between Breast Cancer Screening Rates and Costs

Pearson Correlation Coefficient View

Story 1

Exercise 5 - 2	Exercise 6	Exercise 7 - Rates	Exercise 7 - Calculation Costs to Rate	Exercise 8 - 1	Exercise 8 - 2	Exercise 8 - 3
Calculation Memorial Screening/Costs		Calculation Southern Screening/Costs		Abc		
-0.935235260		-0.883758386				

Hospital Group

Rate
(Screening/Costs)

Memorial

-0.935235260

Southern

-0.883758386

This is a statistical measure which quantifies the strength and direction of the linear relationship between two variables. It ranges from -1 to +1, where -1 indicates a perfect negative correlation, +1 indicates a perfect positive correlation, and 0 indicates no correlation.

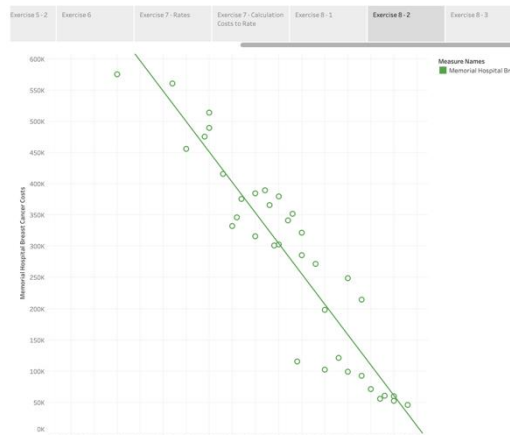
Coefficient interval	Correlation level
0.00 - 0.199	Very low
0.20 - 0.399	Low
0.40 - 0.599	Medium
0.60 - 0.799	Strong
0.80 - 1.000	Very strong

(Heldisari, 2020)

Graphical View

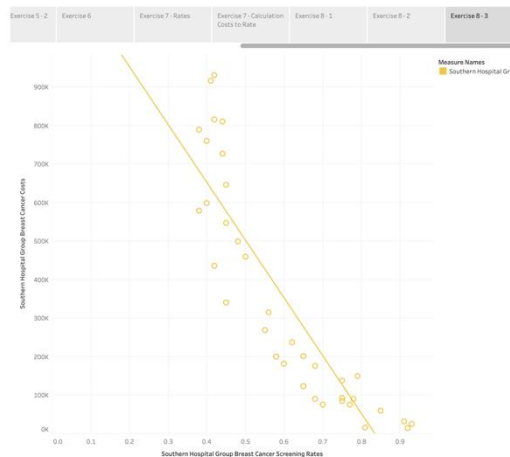
Memorial

Story 1



Southern

Story 1



Association Between Costs and Screening Rates

Correlation in Terms of Direct/Inverse Association in Terms of Weak/Moderate/Strong Associations

In terms of weak/moderate/strong association, it refers to the strength of the relationship between the variables. A weak association means that there is a minimal or negligible relationship between the variables. If the correlation coefficient is close to zero, such as 0.1 or -0.1, it indicates a weak association. A moderate association suggests a moderate level of relationship between the variables; this would be indicated by a correlation coefficient closer to -1 or 1, such as -0.5 or 0.7. A strong association means that there is a strong relationship between the variables; this would be indicated by a correlation coefficient closer to -1 or 1, such as -0.9 or 0.8.

Relationship Between Breast Cancer Screening Rates and Costs

The correlation coefficient of -0.883758386 between breast cancer screening rates and screening costs indicates a **strong** negative association. This means that as breast cancer screening rates decrease, screening costs tend to increase. In terms of association strength, a correlation coefficient of -0.883758386 is a strong association.

Policy Recommendations for Southern Hospital Group

- Investigate the reasons behind the rising costs for breast cancer screening and the reduced screening rates.
- Analyze factors such as changes in insurance coverage, accessibility to screening facilities, public awareness campaigns, or any other potential factors that could be influencing these trends.
- Identifying the underlying causes, the hospital can develop targeted strategies to address the issues and potentially improve both the screening rates and the cost-effectiveness of the screening program.

(Kenton, 2021)

Resources

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- Heller, S., & Moy, L. (2020, August 10). *Breast cancer screening and Health Care Costs*. JAMA Internal Medicine. <https://jamanetwork.com/journals/jamainternalmedicine/article-abstract/2769089>
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- National Center for Health Statistics. (n.d.). Mammography - health, United States. Centers for Disease Control and Prevention. <https://www.cdc.gov/nchs/hus/topics/mammography.htm>



Thank you!

The Mi'Amore Data Analytics Team Aims to
Provide Up-to-date Data to Help the
Administration Team Make Informed Decisions to
Better Serve Our Staff and Patient Community

