

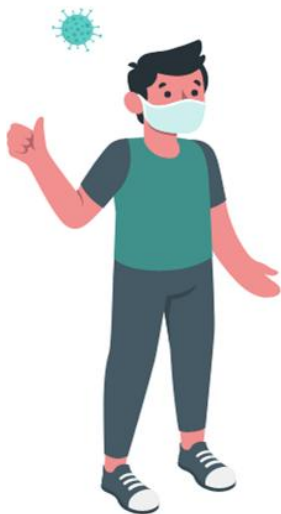
# KPI Analysis- Fortis General Hospital



By - Timsy Singh



# Problem Statement

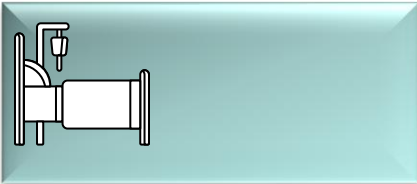


Fortis General Hospital, long recognized for its exceptional healthcare and leading medical professionals, is now focused on deepening its competitive edge by analyzing key operational and safety metrics that directly impact patient satisfaction and overall service excellence





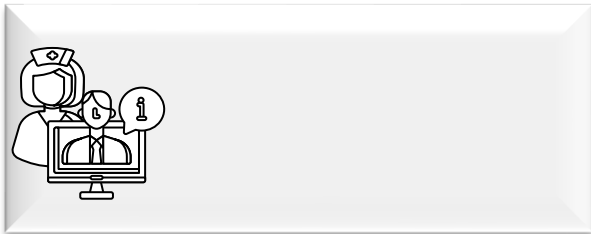
# KPIs Used for Assessment



## Average Licensed Bed Occupancy Rate

This metric is internally measured and calculated as the average percentage of licensed beds that are occupied by patients.

Average bed occupancy rate= (Number of patients in Licensed bed per day/Number of Licensed bed)\*100



## Unassisted Fall Rate Per 1,000 Patient Days

This measure is captured by the National Database of Nursing Quality Indicators (NDNQI). A patient fall is defined as an unplanned descent to the floor with or without injury.

Unassisted falls are where there is no staff member present to assist the patient. This is measured as:

(Number of Patient Falls/Number of Patient Days)\*100



## Staff Responsiveness Top Box Score

This measure is captured by the Hospital Consumer Assessment of Healthcare Providers and System (HCAHPS) Survey, which is a survey sent out to patients following their discharge from the hospital. It includes two questions in the Staff Responsiveness Domain:

- 1) During this hospital stay, after you pressed the call button, how often did you get help as soon as you wanted it?
- 2) How often did you get the help in getting to the bathroom or in using a bedpan as soon as you wanted? It is calculated as:

(Number of patients answering "Always" to the two Staff Responsiveness questions/ Number of patients answering the two Staff Responsiveness questions)\*100



# Data Set Overview



## Key Variables

Month	Average Licensed Bed Occupancy Rate	Unassisted Fall Rate per 1,000 Patient Days	Staff Responsiveness Domain Top Box Scores
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### General Info:

**Source:** Fortis General Hospital

**Size:** 60 rows and 4 columns

**Timeframe:** 5 years

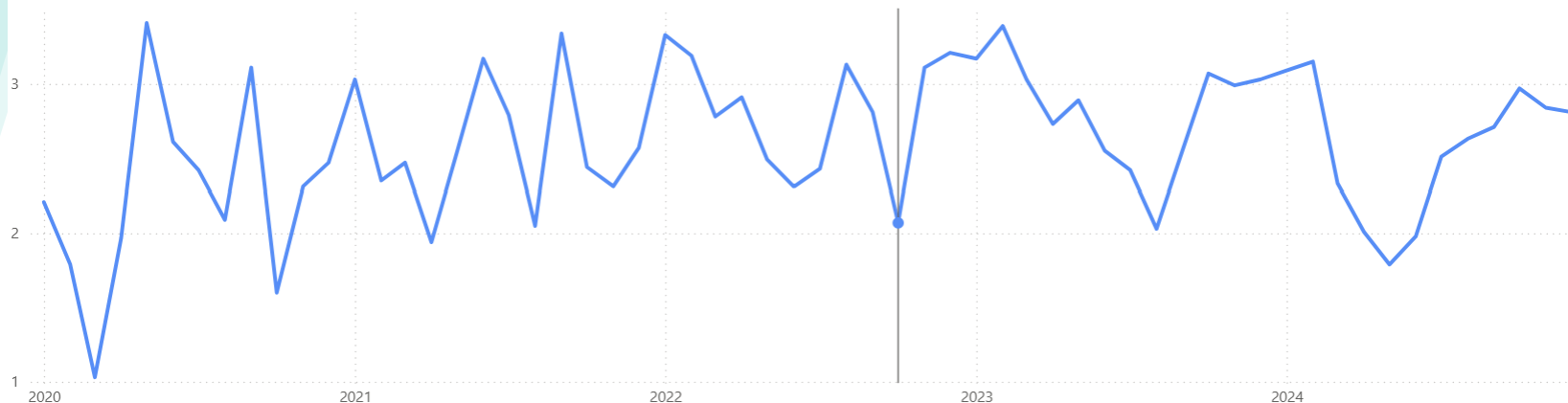


# Data Analysis



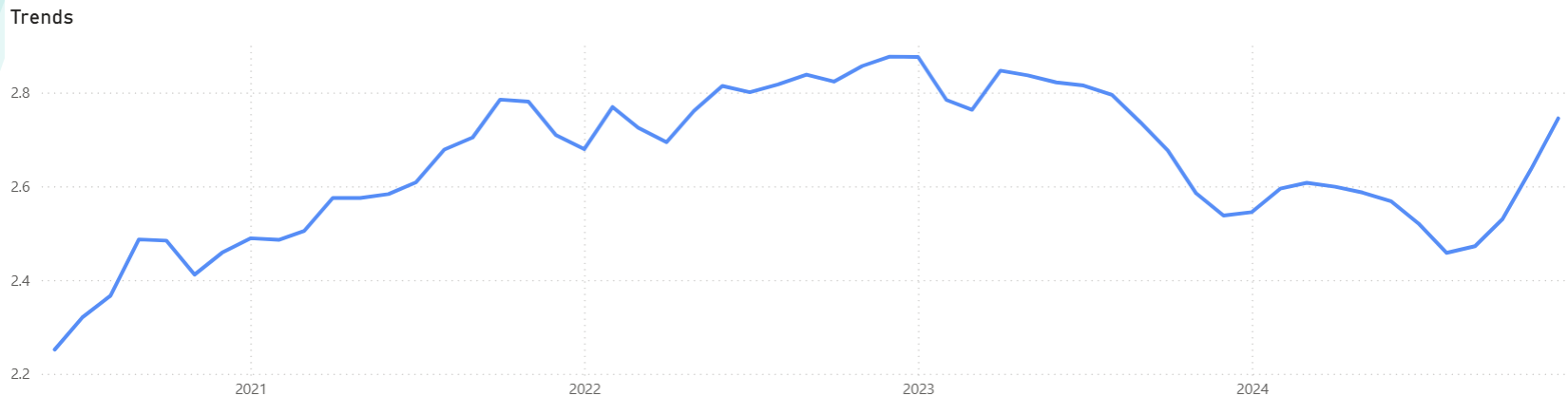
# Time Series Decomposition

Actual Unassisted Fall Over 1000 Patient Days



- This is your original time series
- Shows significant fluctuations month-to-month, ranging roughly from 1.0 to 3.5 falls per 1000 patient days
- There's no obvious sharp spike or crash, but there are periodic peaks and dips suggesting some seasonality

# Time Series Decomposition



- From early 2020 to around late 2022, there's a **clear upward trend** — indicating increasing fall rates
- After that, it seems to level off slightly or dip mildly, suggesting some stabilization or decline.

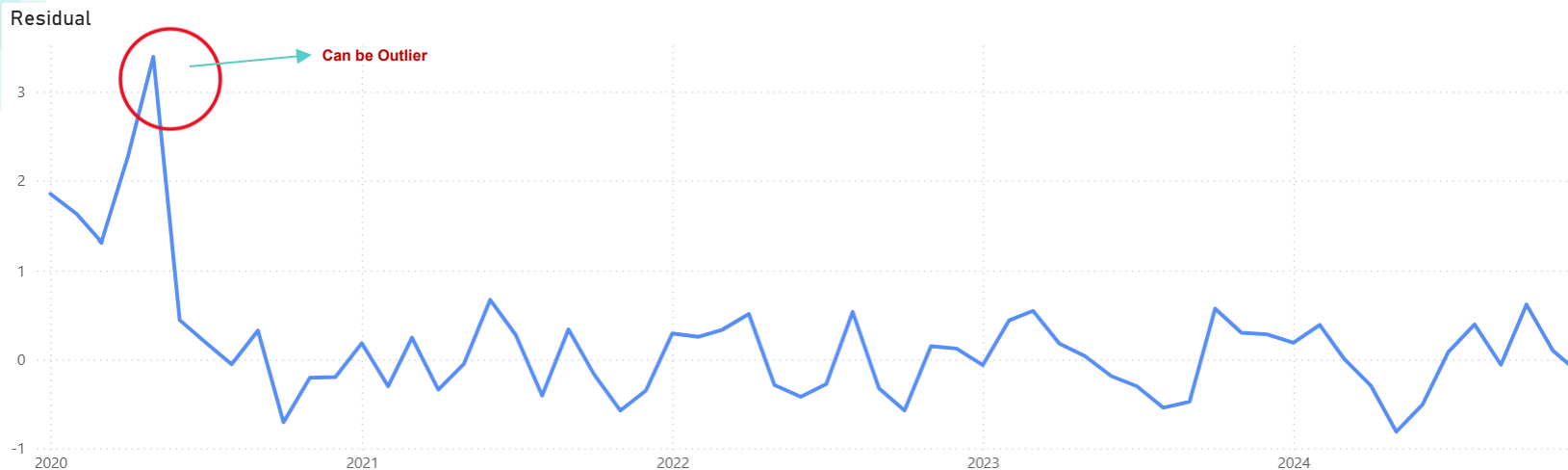
# Time Series Decomposition



- There's a regular **rise and fall pattern** around the same months each year
- **Higher fall rates in late winter to spring**, and **lower in summer or early winter** are observed clearly



# Time Series Decomposition



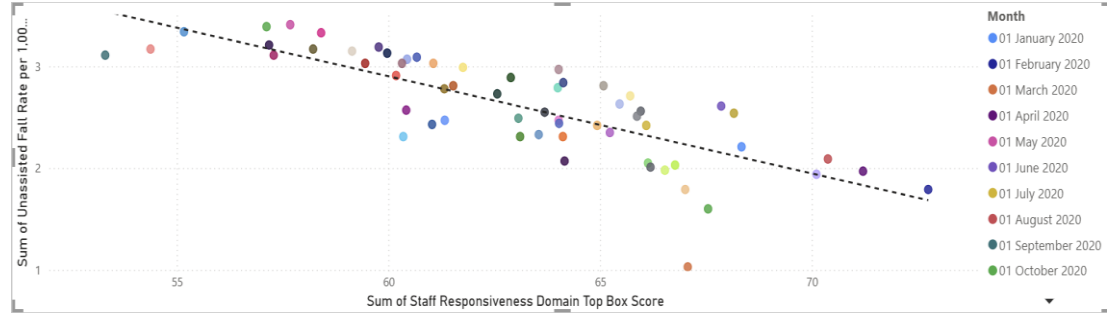


# Relationship Between KPIs

# Unassisted Fall Vs Staff Responsiveness

## Scatter Graph

**Interpretation:** The line of best-fit trends downward, indicating a negative correlation. As the Staff Responsiveness increases, Unassisted fall decreases. The data points are fairly close to the trendline, suggesting the relationship is relatively strong. The spread is moderate, which means other variables might also influence fall rate but staff responsiveness is clearly a significant factor



Fall rate vs Response rate

-0.79

## Correlation

**Interpretation:** The value is negative i.e. **-0.79** which shows that they have a strong relationship but negatively.

## Regression

**Interpretation:** The model is statistically significant and explains **62.6%** of the variance in the outcome. As x-variable coefficient is **-9.55119** therefore for every 1-unit increase in the unassisted fall, the staff responsiveness decreases by **9.55119** units (negative relationship)

Regression Statistics									
Multiple R	0.79134								
R Square	0.626219								
Adjusted R	0.619774								
Standard Error	0.308751								
Observations	60								

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	9.263037	9.263037	97.1709	5.27E-14
Residual	58	5.528982	0.095327		
Total	59	14.79202			

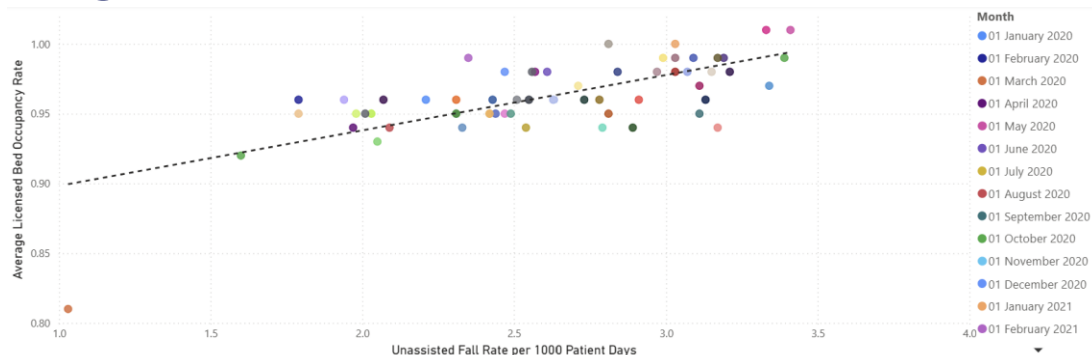
  

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	8.633443	0.612568	14.09385	2.19E-20	7.407255	9.859631	7.407255	9.859631
X Variable 1	-9.55119	0.968924	-9.85753	5.27E-14	-11.4907	-7.61168	-11.4907	-7.61168

# Bed Occupancy Vs Unassisted Fall

## Scatter Graph

**Interpretation:** The line of best-fit trends upward, indicating a positive correlation. As the Unassisted Fall % increases, the bed occupancy % increases and vice-versa is also true. The data points are fairly close to the trendline, suggesting the relationship is relatively strong. The spread is moderate, which means other variables might also influence bed occupancy, but fall rate is clearly a significant factor



Bed occupancy vs fall rate

0.70

## Correlation

**Interpretation:** The value is **0.70** which shows that they have a positive strong relationship.

## Regression

**Interpretation:** The model is statistically significant and explains **49%** of the variance in the outcome. As x-variable coefficient is **-0.039729** therefore for every 1-unit increase in the unassisted fall, the bed occupancy increases by 0.039729 units

Regression Statistics							
Multiple R	0.700112						
R Square	0.490157						
Adjusted R	0.481366						
Standard Error	0.020459						
Observations	60						

ANOVA							
	df	SS	MS	F	Significance F		
Regression	1	0.02334	0.02334	55.76042	4.8E-10		
Residual	58	0.024278	0.000419				
Total	59	0.047618					

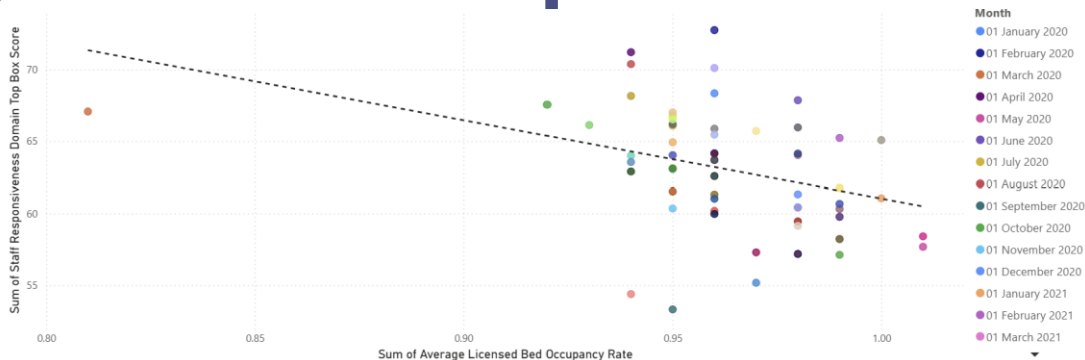
  

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.858576	0.014122	60.79792	3.16E-54	0.830308	0.886844	0.830308	0.886844
X Variable 1	0.039723	0.00532	7.46729	4.8E-10	0.029075	0.050371	0.029075	0.050371

# Bed Occupancy Vs Staff Responsiveness

## Scatter Graph

**Interpretation:** The line of best-fit trends upward, indicating a negative correlation. As the Bed occupancy increases, the staff responsiveness decreases. The data points are not close to the trendline, suggesting the relationship is relatively moderate. The spread is weak, which means other variables might also influence staff responsiveness.



## Correlation

**Interpretation:** The value is negative i.e. **-0.37** which shows that they have a negative moderate relationship.

| Bed Occupancy vs Response rate | **-0.37** |

## Regression

**Interpretation:** The model is statistically significant and explains **13.8%** of the variance in the outcome. As x-variable coefficient is **-0.54** therefore for every 1-unit increase in the bed occupancy, the staff responsiveness decreases by 0.54 units

Regression Statistics								
Multiple R	0.371821							
R Square	0.138251							
Adjusted R	0.123393							
Standard Error	0.038841							
Observations	60							

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.014038	0.014038	9.304985	0.003442
Residual	58	0.087502	0.001509		
Total	59	0.10154			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	1.153291	0.171334	6.731226	8.28E-09	0.810328	1.496254	0.810328	1.496254
X Variable 1	-0.54296	0.177995	-3.05041	0.003442	-0.89925	-0.18666	-0.89925	-0.18666



# Dashboard

Visual Representation of Findings



# Fortis General Hospital KPI Analysis Report

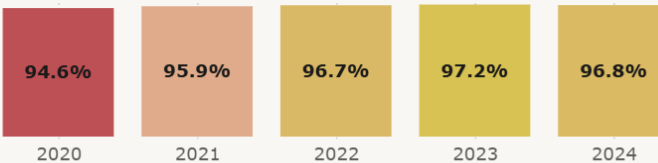


Unassisted Fall Rate per 1,000 Patient Days

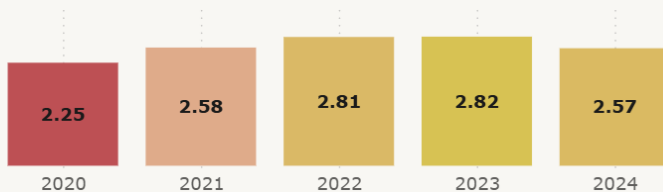
2.61!

Goal: 2.30 (-13.38%)

Average Licensed Bed Occupancy Rate



Average of Unassisted Fall Rate per 1,000 Patient Days



Average of Staff Responsiveness Domain Top Box Score



Quarter

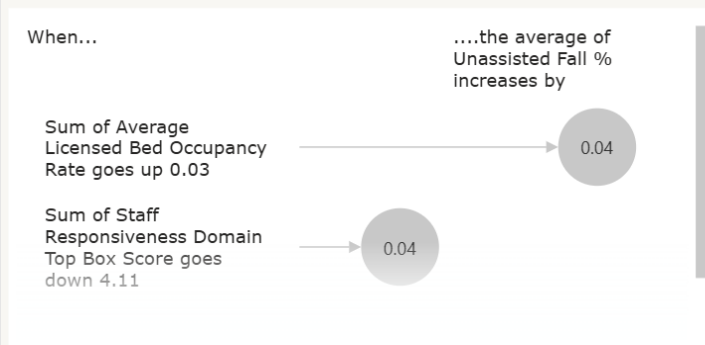
-- Qtr 1 Qtr 2

Qtr 3 Qtr 4

Key influencers Top segments



What influences Unassisted Fall % to Increase ?



Average Licensed Bed Occupancy Rate

96.2%✓

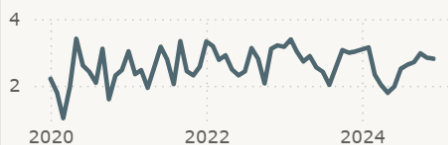
Goal: 66% (+45.78%)

Staff Responsiveness Domain Top Box Score

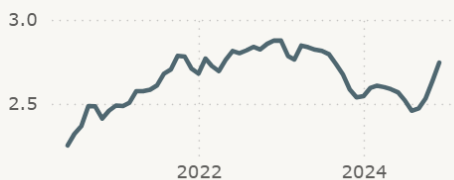
63.1!

Goal: 65 (-2.94%)

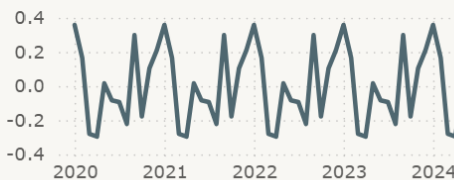
Actual Unassisted Fall Over 1000 Patient Days



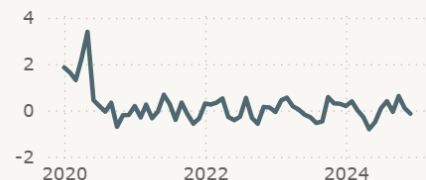
Trends



Seasonality



Residual





## KPIs

## Benchmark

## Insights

Unassisted Fall Rate per 1,000 Patient Days

2.30

**Unassisted fall rates exhibit seasonal patterns**, suggesting recurring trends that may be driven by fluctuations in staffing levels or patient volume. Continuous monitoring is essential to prevent increases, especially with high bed occupancy

Average Licensed Bed Occupancy Rate

66%

The Average licensed bed occupancy rate is notably high, indicating strong demand, overcrowding which may also be driven by unassisted falls leading to longer patient stays **Higher bed occupancy correlates with reduced staff responsiveness**, pointing to staff being overextended during peak occupancy periods, which may compromise patient safety.

Staff Responsiveness Top Box Score

65

Increased staff responsiveness is closely linked to a reduction in falls, suggesting that improved staff attention enhances patient safety and lowers the risk of falls, which currently is **2.94%** lower than the benchmark.

Summary - Higher bed occupancy is associated with higher fall rates and slightly lower staff responsiveness.





# Action Plan



Better staff and resource allocation is needed



Opting for seasonal hire to cater seasonality and peak time



Increasing the licensed bed number if possible to cater the capacity issue which might be acting as a bottleneck



Providing training to the staff to improve response time





# Thank You



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