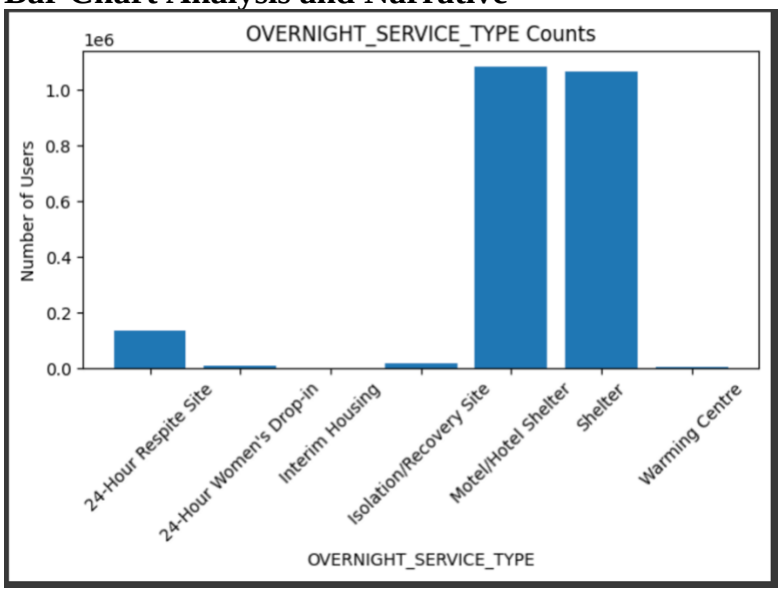
INF2178_A1

Objectives of the Analysis

The primary objectives of this analysis are aimed at providing a comprehensive understanding of the dynamics within Toronto's shelter system, identifying key areas of concern, and informing policy and decision-making to improve the system's efficiency and responsiveness to the needs of vulnerable populations.

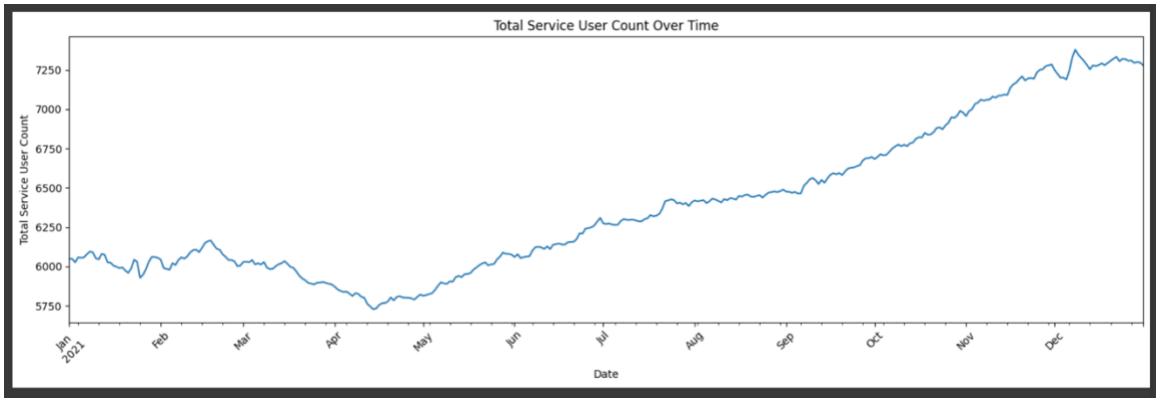
Bar Chart Analysis and Narrative



The bar chart visualizes the count across different overnight service types in Toronto's shelter system.

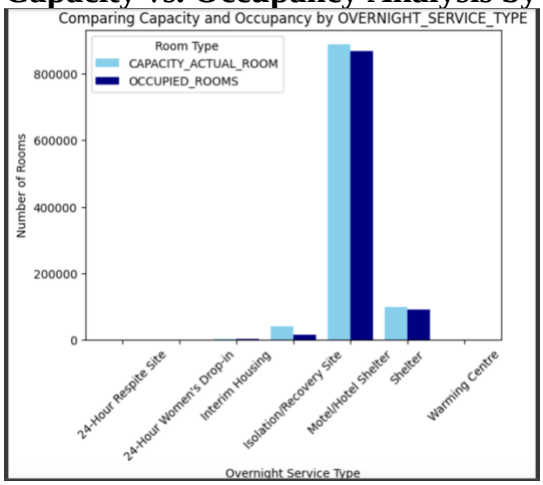
As we can see in the chart, 'Motel/Hotel Shelter' and 'Shelter' services are clearly the most utilized, indicating a heavy reliance on these facilities to provide emergency accommodation. Also, the minor presence of '24-Hour Respite Site' suggests a targeted approach for specific needs within the homeless population.

Shelter Usage Trend Analysis



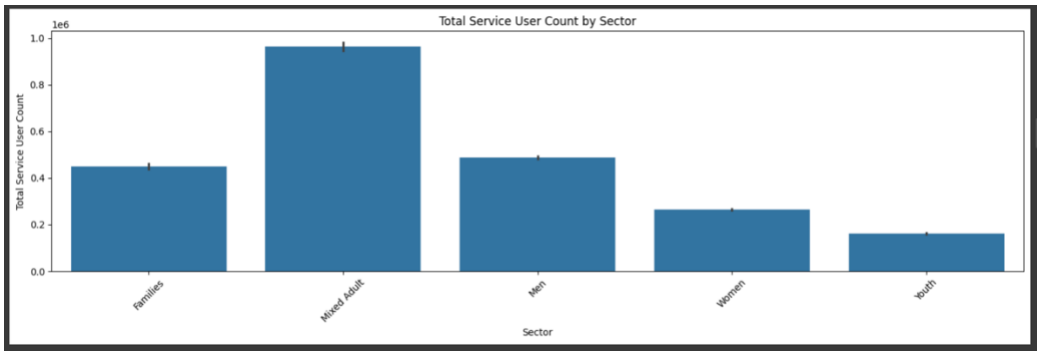
The trend line for Toronto's shelter service usage in 2021 shows a decrease initially, followed by a steady increase from spring. This suggests a seasonal pattern, with more individuals seeking shelter as temperatures drop. The consistent rise towards the end of the year indicates an increasing reliance on shelter services, possibly driven by colder weather and ongoing COVID-19 challenges.

Capacity vs. Occupancy Analysis by Service Type



The bar graph presents a comparative look at the actual room capacity versus the occupancy for different types of overnight services. The 'Motel/Hotel Shelter' type shows the highest number of available rooms, and the occupancy closely matches this capacity, suggesting high utilization rates. Conversely, other service types, such as '24-Hour Respite Site' and 'Warming Centre', show a significant difference between capacity and occupancy, indicating lower utilization. This may reflect a higher demand for Motel/Hotel Shelter' services.

Sector-Based Utilization of Shelter Services



The bar plot above illustrates the total number of service users within each sector of Toronto's shelter system. The 'Mixed Adult' sector shows the highest usage, indicating a substantial demand for services that cater to a diverse adult population. The 'Men' and 'Families' sectors follow, with the 'Women' and 'Youth' sectors showing comparatively lower counts. This distribution reflect the varying levels of service needs or availability across sectors.

T-Test Analysis:

1. **The T-test of occupancy rates for comparing 'COVID-19 Response' and 'Temporary Refugee Response' programs in Toronto's shelters:**

```
T-statistic: -12.888287902869505
P-value: 1.1506752920082957e-35
There is a significant difference between the groups.
```

T-Test Analysis

The T-test conducted on the two groups revealed a significant difference in occupancy rates. With a p-value substantially below the 0.05 threshold (p-value: 1.15e-35), we reject the null hypothesis that there is no difference between the two programs' occupancy rates.

This significant difference points to a distinct impact of the COVID-19 pandemic on shelter occupancy, as opposed to the shelters' response to refugee needs. Such insights can inform policymakers about the varying demands of different emergency response efforts and tailor future strategies to meet these specific requirements more effectively.

2. **The T-test to determine if there was a significant difference in occupancy rates between the difference population groups:**

```
F-statistic: 283.54301265980627
p-value: 8.06844494298329e-121
There are significant differences between the population groups.
```

T-Test Analysis

The T-test indicated a significant difference in occupancy rates, with a p-value far below the 0.05 threshold. This result suggests that the pandemic had a distinct effect on shelter usage compared to the refugee response efforts. I believe the insights are critical for policymakers to tailor strategies that effectively meet the demands of each emergency response.

3. T-Test for COVID-19 Response and Temporary Refugee Response

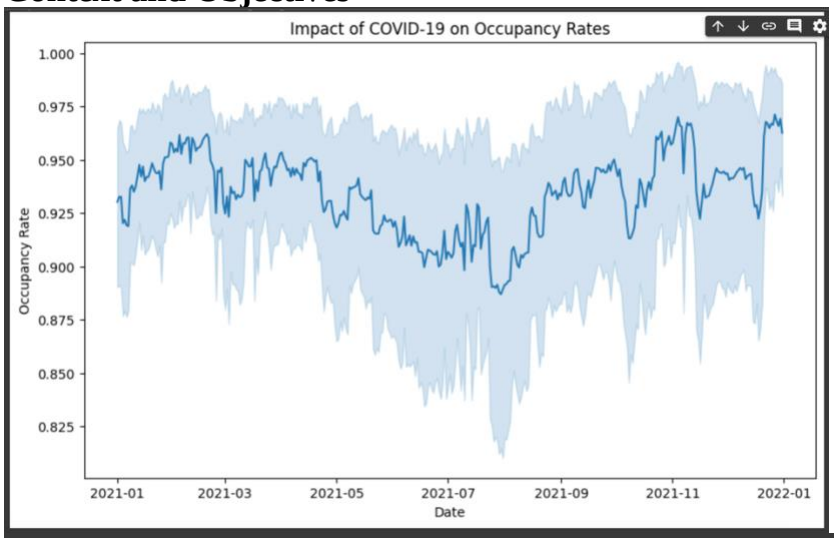
```
T-statistic: -12.888287902869505
P-value: 1.1506752920082957e-35
There is a significant difference between the occupancy rates for COVID-19 Response and Temporary Refugee Response.
```

T-Test Analysis for Shelter Occupancy Rates

The T-test yielded a T-statistic of -12.888, indicating a substantial difference between the two groups. With a p-value of approximately 1.15e-35, the p-value is significantly less than the alpha level of 0.05, we reject the null hypothesis. There is a significant difference between the occupancy rates for shelters under the COVID-19 Response compared to those under the Temporary Refugee Response. This suggests that the interventions and resources allocated for the COVID-19 response had a different impact on shelter occupancy rates than those for refugee assistance.

Analysis and Narrative: Impact of COVID-19 on Shelter Occupancy Rates

Context and Objectives




```
Pre-COVID mean occupancy rate: 0.92239881641994
During-COVID mean occupancy rate: 0.9355651315375937
T-statistic: -5.080082952855529, P-value: 3.869342138689027e-07
Significant difference in occupancy rates.
```

This analysis aims to understand the impact of COVID-19 on shelter occupancy rates, comparing periods before and during the pandemic.

Findings

The average occupancy rate pre-COVID stood at approximately 92.24%, which increased marginally to 93.56% during the pandemic. This suggests a tighter capacity within shelters during the pandemic. The T-test yielded a statistic of -5.080, with a p-value of approximately 3.87e-07, indicating a significant difference between the two periods.

Conclusion

My analysis confirms that the COVID-19 pandemic has had a statistically significant impact on the occupancy rates of shelters. The increase in occupancy rates during the pandemic could be attributed to various factors, such as increased demand for shelter due to economic stock, physical distancing guidelines.