

Evaluating Hospital Utilization Late in the Epidemic

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Abstract

This study evaluated present and future impact of the coronavirus on hospitalization as the virus winds down in the metropolitan area of Syracuse, New York. The study compared adult medicine and adult surgery discharges between January-May 2019 and 2022. The data indicated that 69 percent of the reduction in medical-surgical discharges that occurred since 2019 was offset during 2022. The remaining 31 percent remained at levels experienced in 2020 and 2021. The study clearly demonstrated that medical and surgical discharges increased significantly since 2019. An important question is whether these will continue or if they will level off.

Keywords

Hospitals, Infectious Diseases, Hospitalization

1. Introduction

In recent years, increased attention has focused on the utilization of health care in the United States. This has resulted from the need to accommodate the requirements of populations in the current system as well as concerns regarding the costs of care.

The need to address chronic diseases has become a major part of the mission of the health care system. During 2020 and 2021, the advent of coronavirus placed increased emphasis on the treatment of infectious diseases [1].

For the health care system and especially hospitals, dealing with the coronavirus has involved large provider expenses without regard for the size of these costs. This approach has worked on a short-term basis, however, it may not be sustained over longer periods of time [2] [3].

Between 2020 and 2022, the coronavirus exerted a major impact on the utili-

zation of health care at the community level. The most visible part of this impact was exerted on inpatient beds, both medical-surgical and critical care [4] [5] [6].

This impact was also exerted on inpatient care for other diagnoses such as heart disease and stroke. In many communities, the need to treat patients with coronavirus has limited the resources available to deal with these conditions [7].

As the most recent wave of the coronavirus winds down, local hospitals are attempting to evaluate their remaining medical and surgical capacities. These resources need to be available for the diagnoses that were treated before the advent of the virus.

A major issue for the future of hospital care is the size of inpatient capacity that will be available at the community level. This capacity will be necessary to treat chronic diseases after the epidemic has passed. It will be identified based on medical and surgical conditions that require hospital care, as well as resources that are available to treat them at the community level. This study suggests an approach to this subject.

2. Population

This study focused on hospital utilization in the metropolitan area of Syracuse, New York. This area includes three large hospitals, Crouse Hospital (18,217 inpatient discharges excluding well newborns, 2021); St. Joseph's Hospital Health Center (20,720 inpatient discharges, 2021); and Upstate University Hospital (32,245 inpatient discharges, 2021).

These hospitals provide primary and secondary acute care to an immediate service area with a population of approximately 600,000. They also provide tertiary services to the eleven county Central New York Health Service Area with a population of 1,400,000 [8].

3. Method

This study evaluated the impact of the coronavirus on inpatient hospital utilization at the community level in the metropolitan area of Syracuse, New York in the United States. It also suggested potential future developments concerning this subject.

The study was based on adult medicine and adult surgery inpatients in the Syracuse hospitals. These patients were those aged 18 years and over excluding pediatrics, obstetrics, neonates, and mental health.

In the United States, adult medicine and adult surgery are the largest hospital inpatient populations. During 2021, they accounted for 70.1 percent of inpatients in the Syracuse hospitals. This information was available from Hospital Executive Council data.

Data for the study were obtained from the Syracuse hospitals on a daily basis by the Hospital Executive Council. Through this approach, the study included the most current information available.

The study was based on adult medicine and adult surgery utilization between

January and May 2019 and 2022. The 2019 data were used because they constituted the most recent inpatient population before the advent of the coronavirus in the Syracuse hospitals during 2020. They amounted to a discrete population whose utilization was not affected by the coronavirus.

The 2022 data were employed because they included the most recent populations available as the coronavirus has receded. With the 2019 data, they amounted to the most recent populations available for projecting the future impact of the coronavirus on hospital inpatients.

The first component of the analysis focused on comparison of numbers of medical and surgical inpatients admitted to and discharged from the Syracuse hospitals between January and May 2019 with adult medicine and adult surgery inpatients admitted to and discharged from the hospitals between January and May 2022. Within the five month periods, this information was identified for weekly intervals.

The separation between the 2019 and the 2022 made it possible to compare the impact of the coronavirus on medical-surgical utilization during the two five month periods. These differences suggested the extent to which hospitals will be able to return to inpatient utilization before the coronavirus.

The second component of the analysis focused on emergency department utilization characteristics in the Syracuse hospitals between January and May 2019 and 2022. This analysis was based on differences in weekly numbers of ambulances dispatched to hospital emergency departments in the community.

The analysis of numbers of ambulances dispatched extended to comparison of health care utilization beyond inpatient care. It included ambulance utilization generated by patients who were admitted and those who were not.

4. Results

The first component of the study focused on differences in inpatient medical-surgical patients discharged from the Syracuse hospitals by week between January and May 2019 and 2022. Relevant data are summarized in **Table 1**.

This information demonstrated that numbers of inpatient medical and surgical discharges were relatively consistent during the weekly periods in 2019. Numbers of inpatients ranged between 1100 and 1200. The data also indicated that numbers of weekly inpatients increased during the same periods in 2022. Actual numbers ranged from 755 - 760 to 974 - 994.

Comparison of the weekly data for 2019 and 2022 identified downward developments in the differences between the two years. These differences delineated a return to inpatient utilization characteristics before the advent of the epidemic. The data indicated that 69 percent of the reduction in medical-surgical discharges that occurred during the epidemic had been offset by 2022. Another 31 percent remained.

The study did not determine the extent which the increases in medical-surgical utilization in the Syracuse hospitals would continue. It demonstrated that more

Table 1. Inpatient medical/surgical discharges, Syracuse hospitals.

Week of	2019	2022	Difference
Jan 6-12	1198	755	-443
Jan 13-19	1238	760	-478
Jan 20-26	1078	852	-226
Jan 27-Feb 2	1154	805	-349
Feb 3-9	1183	772	-411
Feb 10-16	1156	815	-341
Feb 17-23	1164	873	-291
Feb 24-Mar 2	1105	864	-241
Mar 3-9	1200	863	-337
Mar 10-16	1146	904	-242
Mar 17-23	1186	866	-320
Mar 24-30	1167	925	-242
Mar 31-Apr 6	1155	921	-234
Apr 7-13	1209	870	-339
Apr 14-20	1147	902	-245
Apr 21-27	1162	946	-216
Apr 28-May 4	1204	918	-286
May 5-11	1181	984	-197
May 12-18	1155	980	-175
May 19-25	1262	928	-334
May 26-Jun 1	1033	902	-131
Jun 2-8	1170	974	-196
Jun 9-15	1129	994	-135

Source: Hospital executive council daily inpatient census report.

than half of the reduction in utilization that occurred during the epidemic has already returned.

Additional experience with inpatient utilization in the Syracuse hospitals will be necessary to determine future inpatient utilization characteristics. This information should suggest whether 2019 utilization characteristics will return.

The second component of the study focused on differences in ambulances dispatched to area hospitals between January and May 2019 and 2022. Relevant data are summarized in **Table 2**.

This information identified changes in health care utilization characteristics between the two time periods. The data indicated that weekly numbers of ambulances dispatched were relatively consistent during 2019. Most of the utilization ranged between 1200 and 1300. The data also indicated that numbers of

Table 2. Hospital emergency department ambulances dispatched, Syracuse hospitals.

Week of	2019	2022	Difference
Jan 6-12	1239	1222	-17
Jan 13-19	1198	1076	-122
Jan 20-26	1301	1039	-262
Jan 27-Feb 2	1143	1080	-63
Feb 3-9	1283	1053	-230
Feb 10-16	1271	1091	-180
Feb 17-23	1259	1201	-58
Feb 24-Mar 2	1215	1145	-70
March 3-9	1296	1252	-44
March 10-16	1227	1207	-20
March 17-23	1357	1195	-162
March 24-30	1304	1219	-85
March 31-April 6	1287	1238	-49
April 7-13	1202	1203	1
April 14-20	1208	1164	-44
April 21-27	1207	1211	4
April 28-May 4	1260	1184	-76
May 5-11	1192	1143	-49
May 12-18	1233	1225	-8
May 19-25	1230	1137	-93
May 26-Jun 1	1251	1226	-25
Jun 2-8	1174	1205	31
Jun 9-15	1192	1195	3

Source: Hospital executive council daily emergency department report.

ambulances dispatched were slightly lower in 2022. For most of the weeks, utilization was below 1200 patients.

The study data indicated that numbers of ambulances dispatched in 2022 were lower than in 2019. The reduction in numbers of ambulances dispatched may result from the impact of the coronavirus epidemic on patient utilization. It is not clear whether these differences were consistently increasing or decreasing.

5. Discussion

In recent years, the coronavirus and other chronic diseases have exerted a major impact on health care in the United States. This study evaluated the present and future impact as the virus winds down at the community level in the metropoli-

tan area of Syracuse, New York. It was based on adult medicine and adult surgery discharges, the largest inpatient hospital services.

The study compared adult medicine and adult surgery discharges during January-May 2019 and 2022. Utilization for 2019 has been extremely important, since it occurred before the impact of the virus. Utilization for 2022 has been an index of the extent to which health care has recovered from the coronavirus. The study also compared ambulances dispatched for the same time periods.

The inpatient data indicated that 69 percent of the reduction in medical surgical discharges that occurred since 2019 has been offset during 2022. The remaining 31 percent remained at levels experienced in 2020 and 2021. It was unclear from the data whether medical ambulances dispatched were consistently increasing or decreasing

The study data clearly demonstrated that medical and surgical discharges had increased significantly after declining during the epidemic. An important question is whether or to what extent these increases will continue or whether they will level off.

This information would require additional data concerning medical and surgical discharges and related utilization. This information is not available from existing sources.

Continued increases would suggest that the health care system could operate with additional utilization in the future. A leveling off of this experience would suggest that health care will be delivered with fewer resources. Health planners should monitor this experience during the future in order to ensure that care is delivered with the highest efficiency at the community level.

Conflicts of Interest

The authors declare there are no conflicts of interest regarding the publication of this paper.

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