



Impact of COVID-19 on Emergency Department Utilization

By: Noumi Chowdhury, MS3; Kianna Eurick-Bering, MS3; Mariam Hjaige, MS3; Ryan Kenerson, MS3; Taylor Revere, MS3; Ryan J. Reece, M.D.

Introduction

The COVID-19 pandemic has significantly impacted emergency department (ED) utilization in the United States

- The National Syndromic Surveillance Program (NSSP) found ED visits declined 42% during the early COVID-19 pandemic, in March and April of 2020 (2).
- Eight of the most common diagnostic categories that saw an increase in visits included diagnoses related to exposure and screening for infectious disease, pneumonia, respiratory failure, and cardiac arrest (2).
- Visits for abdominal pain, musculoskeletal pain, essential hypertension, and nonspecific chest pain decreased (2).
- NSSP data demonstrated a decrease in ED visits for life-threatening conditions including myocardial infarction, cerebral vascular accidents, and hyperglycemic crisis (2).

Limited data exists regarding changes in presentation severity, making it unclear whether COVID-19 has impacted disease severity for those presenting to the ED

- International data presents conflicting results with Canadian Triage Acuity Scale declining in some regions (6) but remaining unchanged in other regions (7).

As the pandemic continues, there is the need to elucidate the impact of COVID-19 on patients accessing services in the emergency department.

- Although data elucidating the changes in severity for emergency department visits suggests an increase in severity, some studies internationally suggest that there has been no increase in severity, perhaps indicating that severity changes are more specific to geographical locations.

Methods

A retrospective chart review study investigating ED encounters was conducted at Hurley Medical Center, a verified Level I Trauma Center, Level II Pediatric Trauma Center, and regional burn center serving the Flint/Genesee County in Michigan.

- Study population was focused on adults 18 years and above.
- Data was collected for ED visits ranging from February 1st, 2019 to July 31st, 2019 and compared to data collected from February 1st, 2020 to July 31st, 2020 after the pandemic began.
- Demographic variables, indicators of disease severity, dispositions, and categorical ICD-10 diagnoses from 2019 were then compared to that of 2020.

Data analysis included a combination of independent t-test, chi-square analysis, and descriptive statistics. This was then aggregated for statistically significant findings.

Findings

Year	2019 (n=33,648)		2020 (n=25,697)		P-value
	Number	(%)	Number	(%)	
Sex					<0.001
Male	14857	44.2	12067	47	
Female	18791	55.8	13630	53	
Race					0.071
White	15025	44.7	11559	45	
Black	17175	51	12899	50.2	
Hispanic	752	2.2	660	2.6	
American Indian & Alaskan Native	114	0.3	90	0.4	
Native Hawaiian & Other Pacific Islander	8	0.02	9	0.035	
Asian	46	0.1	33	0.1	
Other	363	1.1	298	1.2	
Unknown	165	0.5	149	0.6	

Table 1: Comparison of patient demographics in 2019 vs 2020

Year	2019	2020	P-value
Length of Stay (Hours)	6.81	6.97	0.01
CMI	1.65	1.93	<.001

Table 2: Comparison of severity markers in 2019 vs 2020

Year	2019		2020		P-value
	Number	(%)	Number	(%)	
Disposition					<.001
Discharge	23140	68.8	17721	69	
Admit	7116	21.1	5870	22.8	
Skilled Nursing Facility	884	2.6	535	2.1	
Death	230	0.7	255	1	

Table 3: Comparison of disposition in 2019 vs 2020

Year	2019		2020		P-value
	Number	(%)	Number	(%)	
Diagnoses					
Infectious Disease	2682	8	2181	11	<.001
COVID-19	0	0	462	1.8	<.001
Pneumonia	532	1.6	747	2.9	<.001
Respiratory Failure/Insufficiency/Arrest	989	2.9	1035	4	<.001
Socioeconomic Factors	542	1.6	437	1.8	<.05
Mental Health	1376	4.1	1161	4.5	<.05
Nausea or Vomiting	2320	6.9	2107	8.2	<.001
Sprain	789	2.3	452	1.8	<.001
Personal/Family History of Disease	7691	22.9	6373	24.8	<.001
Urinary Tract Infection	1491	4.4	995	3.9	<.01
Disorders of Lipid Metabolism	1941	5.8	1660	6.5	<.001
Myocardial Infarction	457	1.4	414	1.6	<.05

Table 4: Comparison of emergency department diagnoses in 2019 vs. 2020

Discussion/Conclusion

There was a statistically significant increase in indicators of severity such as emergency department length of stay and case-medical-index in 2020 compared to 2019.

There was a statistically significant decrease in patient presentation in 2020 by sex, but not by race.

In regards to patient disposition:

- There was a statistically significant decrease in the number of patients that were admitted and discharged in 2020 compared to 2019.
- There was a statistically significant increase in the percentage of hospital admissions, discharges and deaths in 2020 compared to 2019.
- There was a statistically significant decrease in the number of patients discharged to a skilled nursing facility in 2020 compared to 2019.

In regards to individual ICD-10 diagnoses:

- There was a statistically significant increase in the percentage of infectious disease, COVID-19, generalized symptoms, pneumonia, respiratory failure/insufficiency/arrest, patients with socioeconomic factors, mental health, nausea/vomiting, patients with history or family history of chronic disease, disorders of lipid metabolism, and myocardial infarction presentations in 2020 compared to 2019.
- Despite increases in percentage of the diagnoses listed above, there was an overall decrease in the number of patients presenting with the above diagnoses except for COVID-19, pneumonia, and respiratory failure/insufficiency/arrest.
- There was a statistically significant decrease in the percentage of sprain, unspecified injury, urinary tract infection, and sexually transmitted infection presentations in 2020 compared to 2019.

Limitations: Due to the large sample size of the study, it is difficult to visualize substantial changes in patient presentations due to percentage alone. When analyzing large numerical populations, it is observed that small percentage changes represent hundreds of patients. Variable percentages may also be attributed to the decrease in patient presentations in 2020 due to COVID-19.

Referenced Literature

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