Imaging Utilization Trends in the ED During the COVID-19 Pandemic

Sulaimaan Siddiqui MD, Gregory Neyman MD

Introduction

Prior to 2019, emergency department (ED) visits and imaging volumes had been increasing steadily, driven by rising patient volumes, broader indications for imaging, and multiple other factors. This trend shifted with the start of the COVID-19 pandemic in 2020, which caused a sharp decline in ED visits and overall imaging volumes. Despite a recovery in ED volumes since 2020, it remains unclear if imaging utilization has similarly reverted to pre-pandemic trends. This study aims to examine how the pandemic impacted imaging utilization across multiple modalities (CT, XR, US, MRI) in EDs before and after the rise of the COVID-19 pandemic.

Methods

Prior to 2019, emergency department (ED) visits and imaging volumes had been increasing steadily, driven by rising patient volumes, broader indications for imaging, and multiple other factors. This trend shifted with the start of the COVID-19 pandemic in 2020, which caused a sharp decline in ED visits and overall imaging volumes. Despite a recovery in ED volumes since 2020, it remains unclear if imaging utilization has similarly reverted to pre-pandemic trends. This study aims to examine how the pandemic impacted imaging utilization across multiple modalities (CT, XR, US, MRI) in EDs before and after the rise of the COVID-19 pandemic.

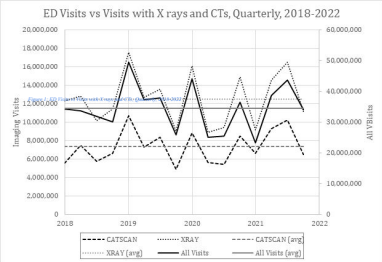


Figure 1: ED Visits vs Visits with X rays and CTs, Quarterly, 2018-2022

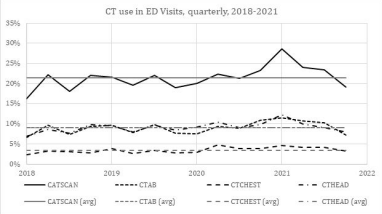


Figure 2: CT use in ED Visits, quarterly, 2018-2021

Results

The peak number of ED visits and imaging studies occurred in Q1 2019, declining until Q1 2020, followed by a 40-50% reduction during the pandemic. A temporary increase in Q4 2020 was observed, but volumes remained below 2019 levels. CT utilization remained stable (21%) from 2018 to 2022, peaking at 28% in Q1 2021, driven by abdomen/pelvis and head studies. Chest X-ray utilization peaked at 40% in Q4 2020, while ultrasound and MRI showed notable increases in Q1 2021. ED volumes fluctuated, with imaging utilization rates rising during viral peaks.

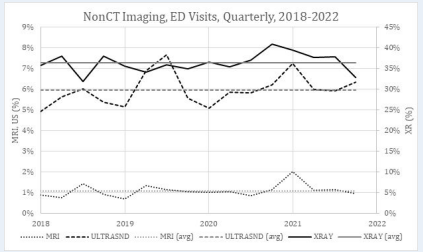


Figure 3: NonCT Imaging, ED Visits, Quarterly, 2018-2022

Discussion

The data suggests ED providers increased imaging utilization during the pandemic, potentially for COVID-19 screening or complications. The rise in CT, X-ray, and MRI usage during viral peaks aligns with prior literature. However, abdominal and head CT studies drove much of the increase, possibly due to an increase in the number of acutely ill patients. By late 2021, imaging trends reverted toward pre-pandemic levels, though not fully. Further research is needed to assess long-term impacts on ED imaging patterns.

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