

Emergency department visits in Italy: 2017-2023 trends, decline and recovery

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Abstract

This study analyzes the trend of Emergency Department (ED) visits in Italy between 2017-2023 using data of Italian National Institute for Statistics (ISTAT). We found a fluctuating trend, with ED visits peaking in 2019, followed by a sharp decline in 2020 and 2021, and partial recovery in 2022 and 2023. In 2023, the ED visit rate reached 58.5 per 1,000 population, marking a 25.6% reduction compared to 2019, but with a 4.7% increase from 2022. The decline during the pandemic affected all age groups, with the 0–5 years category exhibiting an anomalous surge in 2023, recording the second-highest ED visit rate after that of older people. ED visits generally increased with age, but older adults (>75 years) continued to access EDs at lower rates post-pandemic. Sex-stratified trends mirrored overall patterns, though the decline from 2019 to 2023 was more pronounced in females than in males. The trends

observed across the macro-regions closely mirror national data, with the most significant decline occurring in South and Islands regions. These findings indicate that the pandemic has resulted in enduring changes in both economic and healthcare-seeking behaviors, supported by a range of potential contributing factors, the impact of which remains challenging.

Introduction

The Emergency Department (ED) serves as a critical entry point within most healthcare systems worldwide, representing often the initial place of contact for patients requiring urgent or emergency medical care.¹ This acute care setting is equipped to manage a vast array of urgent health conditions, including critical injuries, complex illnesses and other medical emergencies, frequently acting as the primary healthcare resource for individuals lacking consistent access to primary care.² However, the role of the ED has undergone significant changes over time, expanding beyond its traditional function of emergency care to encompass the management of various health conditions, many of which could be potentially addressed in alternative healthcare settings given adequate resource allocation.^{3,4}

The crowding of the EDs has hence emerged as a substantial challenge, associated with adverse outcomes including prolonged patient wait times, heightened patient anxiety, diminished quality of care, and, in severe cases, compromised patient health.⁵ Contributing factors to ED crowding are multifactorial, encompassing limited primary care accessibility, increased demand for urgent care services, seasonal infectious disease outbreaks, shortage of emergency physicians and demographic shift towards an aging population characterized by multiple and complex comorbidities.⁶ Additionally, constraints in hospital bed availability and inefficiencies in patient flow contribute to exacerbate the problem.⁶

The coronavirus disease 2019 (COVID-19) pandemic has certainly underscored the imperative to understand and mitigate ED crowding.⁷ Analyzing ED utilization patterns, particularly stratified by age and sex, yields valuable insights into healthcare service demand and facilitates the identification of targeted interventions to enhance operational efficiency.⁸ These analyses can elucidate the root causes of overcrowding, enabling the development of evidence-based, proactive strategies to optimize emergency care delivery, resource allocation, patient flow and prevent unnecessary strain, ultimately warranting sustained capacity to provide high-quality care to patients with real emergency needs.⁹

Therefore, this study is aimed to present a nationwide analysis of recent ED visit trends in Italy (years 2017-2023), examining recent evolutions across distinct age and sex demographics. The objective is to delineate key demographic patterns that can inform assessments of emergency service resilience and evolving healthcare needs of the population.

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Materials and Methods

We accessed the official website of the Italian National Institute for Statistics (ISTAT), which is based on the “Multipurpose Survey on Families: Aspects of Daily Life - General Section”. The sample survey “Aspects of Daily Life” is part of an integrated system of social surveys (*i.e.*, the Multipurpose Surveys on Families) and collects key information on daily lives of individuals and families.¹⁰ The survey questionnaires, conducted annually in February, covers various aspects of self-reported data from households about health service utilization, including ED access by respondents or their family members. The ISTAT sample surveys typically involve a large number of subjects to ensure that the outcome is statistically significant. For health surveys and use of healthcare services, the sample may involve between 20,000-30,000 people or more, divided into homogenous representative groups based on age, gender, geographical region, etc. Our search was based on the following criteria: “Use of Emergency Department and Medical On-Call Service – Detailed Age Breakdown”, limiting the analysis to the “Use of Emergency Department”, between the years 2017-2023 (*i.e.*, the last available update), and stratified for age classes, sexes and macro-regions. The output of the digital search was the number of patients who accessed the ED in the 3 months prior to the interview $\times 1,000$ people with the same characteristics. The raw data were exported in an Excel file, graphically plotted and analyzed. This study was conducted in accordance with the Declaration of Helsinki. ISTAT is a totally anonymized and publicly available database, so that this study was exempted from Institutional Review Board review.

Results

The results of our analysis are summarized in Table 1, and Figures 1 and 2. The cumulative burden of ED visits in Italy exhib-

ited a fluctuating trend, with a steady increase from 2017 to 2018, peaking in 2019, followed by a sharp decline in 2020, reaching its lowest point in 2021, before rising again in the subsequent two years, culminating in 58.5 ED visits $\hat{1},000$ population in 2023 (Figure 1). A similar pattern was observed when the analysis was stratified by age groups, with a peak in 2019, followed by a consistent decline in 2020 and 2021, and a partial recovery in the two years thereafter. As expected, the rate of ED visits $\hat{1},000$ population generally increased with age, but with the 0-5 years age group showing an anomalous rise in 2023, recording the second highest overall rate of admissions (Figure 1). When comparing 2023 to 2019, ED visits decreased across all age groups (total reduction: -25.6%), although no clear pattern emerged (Table 1). Notably, total ED visits in 2023 were higher than in 2022 (total increase: +4.7%), even if this increase was not uniform across age groups. The 55-64 and >75 years age groups actually showed a reduction in ED visits, contrary to the overall trend. The trend in ED visits from 2017 to 2023 for both sexes is shown in Figure 2, mirroring the overall trend, with a decrease in ED visits from 2019 to 2023 that was more pronounced in females than in males (-31.1% vs. -19.5%, respectively). Moreover, the increase in ED visits in 2023 compared to 2022 was more marked in males than in females (+6.8% vs. +2.6%, respectively).

The data on ED visits $\hat{1},000$ population between 2017-2023 across Italian macro-regions is summarized in Figure 3 and closely mirrors the national trend, reflecting a steady decline from 2019 to 2020-2021, followed by an increasing trend in 2022 and 2023. Compared to 2019, the North-West region had a 29.8% reduction in ED visits in 2023, followed by the South and Islands regions, with reductions of 30.8% and 36.7%, respectively. The North-East and Central regions experienced minor declines, with reductions of 13.7% and 23.0%, respectively. Importantly, the Islands and North-East macro-regions displayed the most important rebound in 2023 compared to 2022, while the other macro-regions showed the lower recovery.

Table 1. Burden of ED visits in Italy ($\times 1,000$ population) during the years 2017-2023.

Years	2017	2018	2019	2020	2021	2022	2023	2023/2019	2023/2022
Age classes									
All years	73.8	75.9	78.6	50.5	42.9	55.9	58.5	-25.6%	4.7%
0-5 years	95.3	110	103.7	44.9	38	59.2	98.2	-5.3%	65.9%
6-14 years	57.1	49.8	70.8	30.1	21.3	39.4	46.2	-34.7%	17.3%
15-24 years	63.0	62.8	57.3	38.5	28.7	46.8	48.0	-16.2%	2.6%
25-34 years	68.2	67.5	70.7	44.0	38.6	50.0	50.1	-29.1%	0.2%
35-44 years	62.6	68.2	64.8	46.4	41.4	49.8	51.7	-20.2%	3.8%
45-54 years	63.4	67.5	66.3	50.0	39.9	50.4	55.0	-17.0%	9.1%
55-64 years	71.0	73.2	72.5	47.0	43.6	52.4	51.5	-29.0%	-1.7%
65-69 years	74.4	69.8	81.1	47.9	42.4	49.4	54.2	-33.2%	9.7%
70-74 years	73.2	89.8	98.4	60.9	54.8	52.1	64.6	-34.3%	24.0%
75-79 years	108.7	108.8	116.3	78.7	65.1	88.8	67.6	-41.9%	-23.9%
>80 years	133.7	130.6	139.9	96.3	83.2	108.9	99.8	-28.7%	-8.4%
Sexes									
Males	76.2	76.5	76.4	50.6	43.2	57.6	61.5	-19.5%	6.8%
Females	71.6	75.3	80.7	50.5	42.6	54.2	55.6	-31.1%	2.6%
Macro-regions									
North-West	84.7	91.0	94.2	56.5	46.8	66.4	66.1	-29.8%	-0.5%
North-East	87.7	86.0	90.2	65.2	56.3	70.6	77.8	-13.7%	10.2%
Center	79.6	78.0	75.5	49.9	46.1	56.6	58.1	-23.0%	2.7%
South	51.8	56.4	58.2	37.1	30.1	39.1	40.3	-30.8%	3.1%
Islands	59.6	59.0	68.7	39.7	31.1	36.9	43.5	-36.7%	17.9%

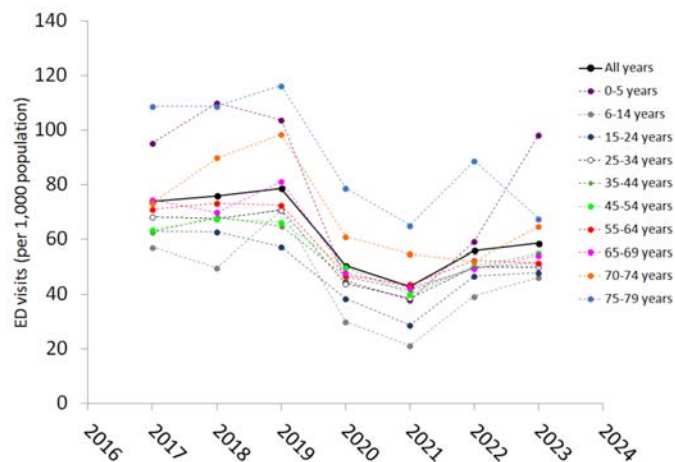


Figure 1. Burden of ED visits in Italy ($\times 1,000$ population) during the years 2017-2023 stratified by the age of the patients.

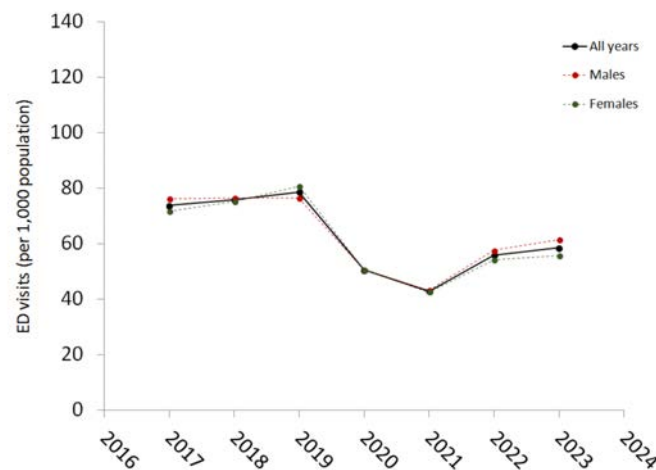


Figure 2. Burden of ED visits in Italy ($\times 1,000$ population) during the years 2017-2023 stratified by the sex of the patients.

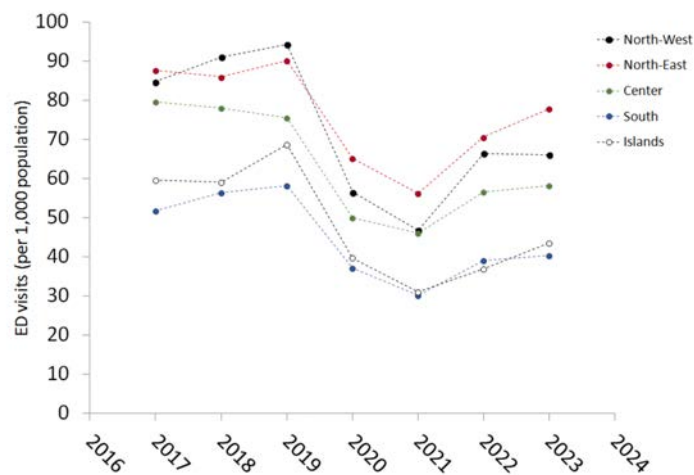


Figure 3. Burden of ED visits ($\times 1,000$ population) in the year 2017-2023 across different Italian macro-regions.

Discussion

The results of our analysis show a significant decline in ED visits in Italy between 2019 and 2021, followed by a partial recovery in 2022 and 2023. However, ED utilization has remained below pre-pandemic levels observed between 2017 and 2019 (Figure 1). These trends likely reflect multiple factors. The 25.6% reduction in overall ED utilization in 2023 compared to 2019 is suggestive of changes in healthcare-seeking behaviors and persistent impacts of the COVID-19 pandemic on emergency care access, with only a modest recovery marked by a 4.7% increase in ED visits from 2022 to 2023.

The observed decline in ED visits during the COVID-19 pandemic aligns with findings from other studies conducted in Italy. A study by Sanmarchi *et al.*,¹¹ using data from an Italian nationwide survey of 25,000 families between 2015 and 2020, reported a decrease in ED visits for acute conditions potentially unrelated to COVID-19 in 2020, attributed to lockdown measures and fear of infection in healthcare settings. Another retrospective cohort study explored the impact of the COVID-19 pandemic on ED access among older adults, reporting a 25.3% decrease in 2020 compared to 2019.¹² Similar trends were corroborated by an analysis conducted by the Academy of Emergency Medicine and Care (AcEMC),¹³ which found an over 50% reduction in ED visits during the 2020 lockdown, primarily affecting low-priority cases, with only partial recovery in subsequent months. More recently, Zaboli *et al.* analyzed a five-year trend (2019-2023) in ED visits in the province of Bolzano.¹⁴ Consistent with our findings, they reported a significant decline in ED visits from 2019 to 2020 (-28%) and 2021 (-21%), but followed by a return to pre-pandemic levels in 2022 (-0.1%) and 2023 (-0.1%). Notably, a 10% increase in non-urgent ED visits was nearly offset by a 10% reduction in urgent cases.

Further insights emerge from our analysis regarding the heterogeneous trends across age groups (Figure 1). The COVID-19 pandemic appears to have differentially affected specific populations. Children (0-14 years) exhibited the sharpest decline and strongest recovery in ED visits, whereas older adults (>75 years) continued to access EDs at lower rates than before the pandemic. The pronounced decline in pediatric ED visits during the first wave of the pandemic, observed in other national studies,¹⁵ may be attributed to predominance of non-urgent cases among children, which may have led to avoid the ED for concerns about SARS-CoV-2 infection. The subsequent resurgence of pediatric respiratory infections in late 2022 and early 2023, driven by increased circulation of respiratory syncytial virus (RSV), influenza and COVID-19 in a virtually immunologically naive population after relaxation of public health measures (e.g., school reopening, restored public transportation, reduced face mask use), has likely contributed to a sharp increase in pediatric ED visits.¹⁶ Additional factors may help explain this finding. For instance, the incidence of invasive *Haemophilus influenzae* infections fluctuated during the pandemic, with a post-2022 resurgence primarily driven by non-typeable *Haemophilus influenzae* bacteremia and pneumonia.¹⁷ Moreover, a recent longitudinal study by Zoboli *et al.* reported a significant decline in pediatric emergency department visits for traumatic injuries at onset of the COVID-19 pandemic (March 2020), followed by a progressive increase until April 2022, when emergency measures were lifted.¹⁸

Conversely, older adults (>75 years) demonstrated a less pronounced decline in ED visits for urgent conditions (Figure 1), likely due to their higher prevalence of chronic diseases and comor-

bidities.¹⁹ This differential trend may also be influenced by behavioral adaptations, increased use of alternative care modalities developed during and after the pandemic (e.g., telemedicine, wearable health monitoring devices), and implementation of tailored healthcare strategies for older adults.^{20,21} Notably, no substantial differences were observed in the overall trend of ED visits between sexes. However, females exhibited the largest decline in ED visits during the COVID-19 pandemic and the most modest increase in the post-pandemic period (Figure 2). The trend observed across the macro-regions, which closely mirrors national data, confirm the existence of regional disparities in disruption of access to emergency services.

Although our study benefits from the use of a nationally representative dataset and an extended seven-year observation period, some limitations must be acknowledged. First, reliance on self-reported ED visits introduces the potential for recall bias. Second, our dataset lacks information on severity and underlying reasons for ED visits, which could provide a more comprehensive understanding of the observed trends. The particular structure of the dataset used in this study (e.g., the lack of specific intervals of coincidence around the values) limits the ability to perform analyses that could otherwise facilitate a statistical interpretation of the observed trends. Finally, our findings are specific to Italy and may not be directly generalizable to other countries with different healthcare systems and pandemic responses.

Conclusions

The results of this study provide valuable insights into the long-term impact of the COVID-19 pandemic on ED utilization in Italy. Our findings suggest a sustained reduction in emergency care access during the peak of the COVID-19 pandemic (i.e., 2020-2021) followed by a non-complete restoration in the two following years, with certain population groups disproportionately affected. It is plausible that, akin to the fear of contagion during the peak of the COVID-19 pandemic,²² the death of a significant number of older and/or chronically ill individuals, coupled with concerns about long waiting times and presence of inexperienced physicians at the bedside, may have contributed to incomplete recovery of ED visits to pre-pandemic levels.²³ It is also important to consider that EDs are increasingly used by populations with lower socioeconomic status, whereas those with greater financial resources may often bypass the ED and seek care directly from specialists, as highlighted in the study of Ohaiba *et al.*⁸ Nonetheless, further research is warranted to assess the long-term implications of these trends for developing strategies aimed at ensuring equitable access to emergency care across all demographics and regions.

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