Examining contributing factors to long wait times in emergency departments

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INTRODUCTION

- Emergency departments (EDs) face significant challenges in maintaining patient flow due to:
  - Sudden spikes in patient traffic
    - Often experience unpredictable surges in patient volume. [1]
    - Contributing factors include seasonal illnesses, severe weather events, and local epidemics.
  - Limited physical space in EDs can hinder patient flow and contribute to extended wait times. [2]
  - Proper triage assessments decrease waiting times for patients. [3]
  - Staffing shortages [4]
- Prolonged wait times are associated with increased morbidity and mortality. [5]

METHODS

Statistical software used: Python

1. Identify a specific age group that has longer wait times by examining:
   - Mean wait time of each triage process by age group.
   - Distribution of diseases (ICD-10 codes) by age group.
   - Distribution of time per triage process for seniors (65+ years old).
   - Distribution of time before ED departure by diseases and gender for seniors.
2. A linear regression model to determine which factors significantly contributed to the longest wait times for seniors.

Table 1. Average wait time (min) per triage process by age groups

	Age group (years)			
Triage process	0-5	6-20	21-64	65+
Registration	9.3	8.4	6.5	6.5
Enter treatment space	61.7	66.3	77.1	69.4
Initial assessment	90.6	98.5	118.9	114.9
Lab test	177.7	159.1	151.9	152.9
Diagnostic Imaging	152.4	146.9	200.4	141.6
Disposition	186.3	220.7	311.9	261.9
Departure	192.9	236.9	373.6	583.9

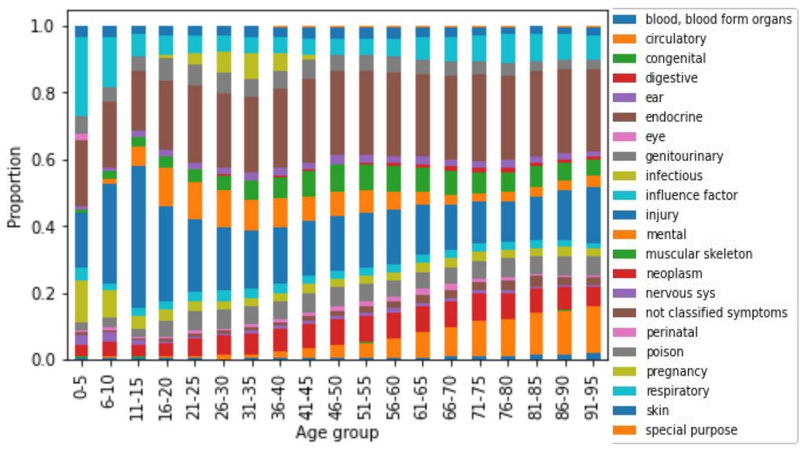

Figure 1. Distribution of diseases by age group

Table 2. Factors identified through linear regression that significantly increase time before ED departure (min) for seniors

Disease codes	Coefficients (SE)	P-value
Endocrine	182.4 (34.2)	< 0.001
Infectious	164.0 (34.8)	< 0.001
Mental	360.5 (33.9)	< 0.001
Not classified symptoms	111.4 (30.9)	< 0.001
Respiratory	166.4 (31.3)	< 0.001

RESULTS

- Mean wait time per triage process differs by age group (Table 1).
- Mental health issues occur more in younger age groups (around 20 years old) than in seniors (Fig. 1).
- Time before disposition decision and time before ED departure are much longer in the admitted group (Fig. 2).
- Time before ED departure varies between men and women with the same disease (Fig. 3).
- Factors that significantly increase time before ED departure: endocrine, infectious, mental, nonclassified symptoms, respiratory (Table 2).

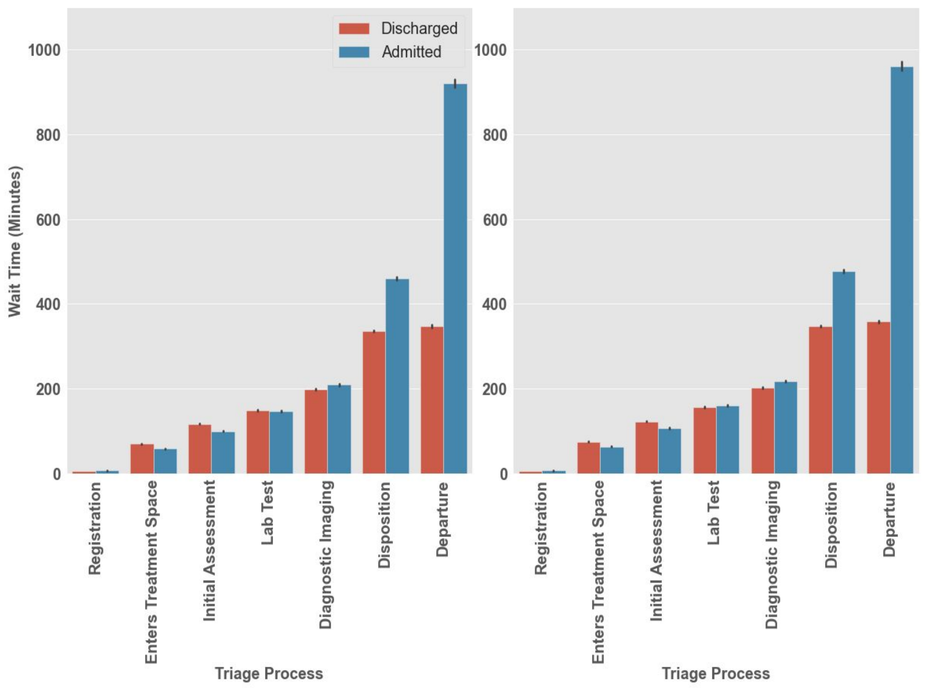

Figure 2. Wait time of triage processes by men (left) and women (right) with respect to admission status for seniors

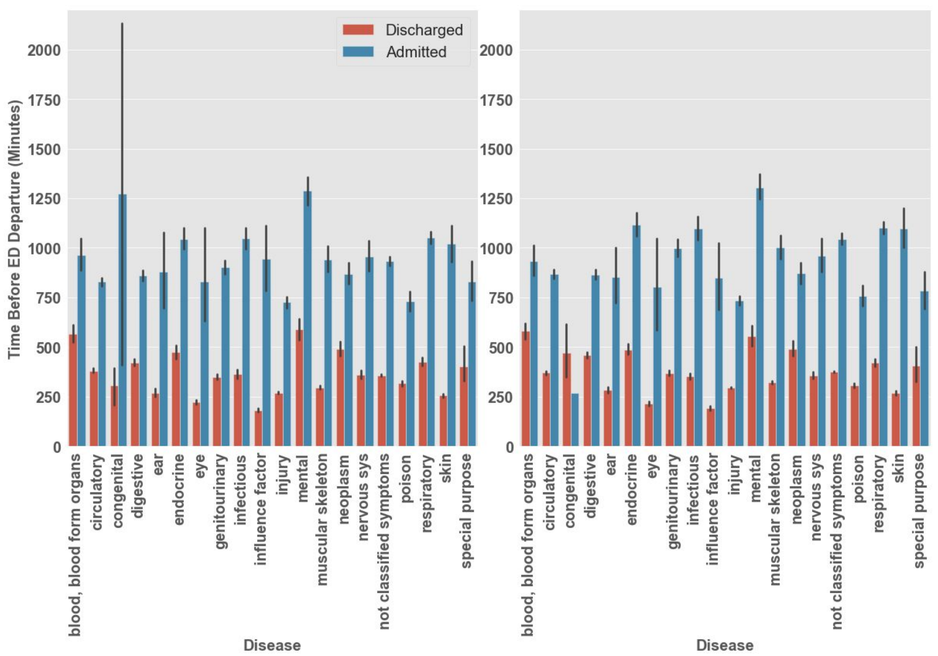

Figure 3. Time before ED departure by men (left) and women (right) with respect to admission status and disease for seniors

DISCUSSION

- Seniors face challenges accessing timely healthcare, resulting in longer wait times compared to other age groups.
  - Complex medical conditions and multiple comorbidities, requiring a more extensive evaluation and treatment. [6]
  - Communication difficulties, including hearing impairments or cognitive decline.
  - Requires more comprehensive assessments, consultations with multiple specialists, and additional diagnostic tests.
  - Certain diseases significantly increase times before ED departure due to more essential and complex evaluations.
- Longer times before ED departure for seniors.
  - Longer lab times for testing.
  - Limited bed availability.
  - Discharge procedures and paperwork.
- Mental health issues raises concern:
  - Increase with the growing number of seniors [7]
  - Limited accessibility to mental healthcare and shortage of specialized services.
  - Financial constraints.
- Waiting periods can vary between gender due to:
  - Patient's conditions and the corresponding triage assessment.
  - Hospital policies addressing gender-related needs.

CONCLUSION

- To address long wait times for seniors:
  - Enhance senior healthcare access and prioritize their needs.
  - Improve coordination and communication among healthcare professionals.
- To address the problem of wait time for mental healthcare:
  - Increase accessibility to mental healthcare for younger age groups.
  - Utilize telehealth and digital platforms to provide remote mental health services and consultations.
- Since time before ED departure differs by disease type and gender, more efficient strategies that concern categories of these variables with longer wait times are necessary.
- Streamline discharge procedures, invest in advanced diagnostics, promote interdisciplinary collaboration, utilize telemedicine, and focus on patient education and self-care in order to reduce the wait time for each procedure.

STRENGTHS AND LIMITATIONS

Strengths:

- Factors that affect the wait time such as gender, diseases, and age group are identified.
- A comparison of the wait time between groups with different admission statuses and diseases was performed.

Limitations:

- Subcategories of diseases were not taken into account to explore the further impact on wait time.
- Could not examine wait times by institution zones (e.g., urban vs. rural) due to risk of identification
- Did not have data on facilities such as staff, equipment, and capacity of the departments.

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