National Patterns of Campus EMS Demand and Resource Utilization in College Dormitories

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Abstract

Many colleges and universities operate campus-based emergency medical services (EMS) programs to provide rapid response within residence halls and reduce demand on municipal fire and EMS systems; however, national benchmarks describing call composition and operational workload remain limited. This study uses the National Emergency Medical Services Information System to quantify campus-associated EMS utilization and inform evidence-based resource allocation. A retrospective analysis of 2025 prehospital encounters was conducted. Incidents in dormitory-designated locations among patients aged 18 to 24 years were included. Primary impression ICD-10 diagnoses were grouped into operational categories: administrative or unknown, alcohol-related, allergy, cardiovascular, drug or substance-related, generalized weakness or dizziness, gastrointestinal, injury or trauma, mental health, neurological, respiratory or infectious, and other medical. Outcomes included call frequency, level of care, temporal distribution, and on-scene time. Among 17,248 encounters, volume was concentrated in other medical, injury or trauma, alcohol-related, and mental health presentations. Most incidents were managed at the BLS level, whereas neurological and cardiovascular complaints required greater ALS utilization. Scene times were consistent, and demand peaked during late-night and weekend hours. Collegiate EMS demand is predominantly moderate acuity and transport-oriented, supporting BLS-focused staffing with targeted ALS coverage and surge scheduling during peak periods for institutional planning purposes nationwide.

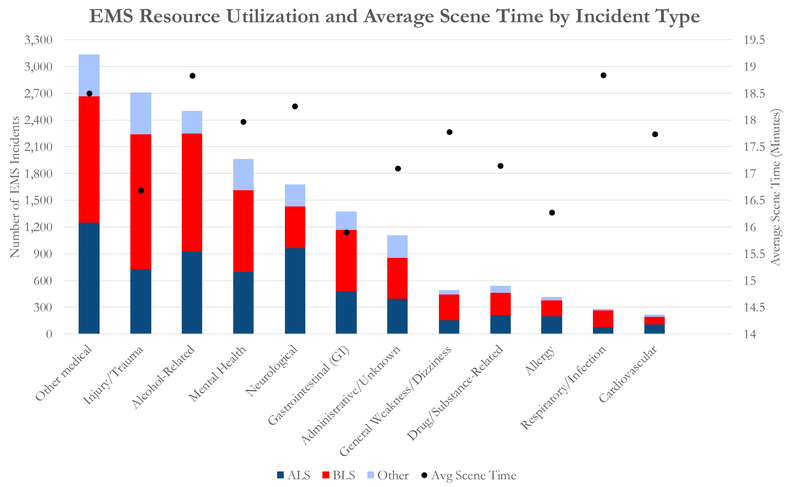
Introduction

Numerous colleges and universities operate campus-based emergency medical services (EMS) programs to respond to incidents within residence halls and reduce reliance on municipal systems. Alcohol-related illness, minor injury, and behavioral health complaints comprise a large share of collegiate EMS utilization, yet existing evidence is largely limited to single-institution or survey-based studies, limiting generalizability for operational planning.[1-3] National benchmarks describing call mix, acuity, timing, and resource utilization remain lacking, constraining data-driven staffing and deployment decisions. The National Emergency Medical Services Information System (NEMSIS) provides standardized, nationwide prehospital records that enable objective evaluation of collegiate EMS demand at scale. This study uses national NEMSIS data to characterize the clinical composition, temporal distribution, and operational workload of dormitory-associated EMS activations and to establish benchmarks to inform evidence-based campus EMS staffing and resource allocation.

Methods

A retrospective analysis of the National Emergency Medical Services Information System (NEMSIS) 2025 national dataset evaluated dormitory-designated EMS incidents among patients aged 18–24 years. Primary impression ICD-10 diagnoses were grouped into operational categories: administrative/unknown, alcohol-related, allergy, cardiovascular, drug/substance-related, generalized weakness/dizziness, gastrointestinal, injury/trauma, mental health, neurological, respiratory/infectious, and other medical. Outcomes included encounter frequency, level of care (basic life support [BLS] vs advanced life support [ALS]), transport/refusal disposition, temporal patterns, and on-scene time. Descriptive statistics summarized call mix and resource utilization.

Results



Heatmap of EMS Activations

Hour of the Day	Sunday Count of Events	Monday Count of Events	Tuesday Count of Events	Wednesday Count of Events	Thursday Count of Events	Friday Count of Events	Saturday Count of Events
00:00:00	156	158	154	143	171	257	276
01:00:00	381	133	114	133	148	213	424
02:00:00	378	112	100	108	128	214	355
03:00:00	282	91	81	78	80	166	330
04:00:00	197	66	60	60	76	109	202
05:00:00	120	58	48	46	50	59	96
06:00:00	63	43	47	33	42	46	59
07:00:00	48	40	52	40	43	51	62
08:00:00	41	55	60	45	47	47	50
09:00:00	50	63	64	53	58	63	53
10:00:00	70	80	85	72	72	77	47
11:00:00	55	66	83	74	73	67	53
12:00:00	51	69	98	63	54	94	66
13:00:00	75	88	102	90	71	71	81
14:00:00	71	95	90	90	83	74	68
15:00:00	54	88	93	79	78	78	79
16:00:00	70	82	91	71	77	68	74
17:00:00	72	64	84	71	96	77	66
18:00:00	78	89	82	94	84	90	86
19:00:00	100	88	115	83	89	64	114
20:00:00	122	119	126	107	98	81	119
21:00:00	130	136	133	114	122	104	112
22:00:00	139	158	146	125	164	142	145
23:00:00	148	158	136	146	117	207	179

Discussion/Conclusion

This national analysis demonstrates that collegiate residential EMS demand is concentrated within a limited number of high-volume, predominantly moderate-acuity presentations. Of 17,248 encounters, the largest categories included other medical (n = 3,152), injury/trauma (n = 2,961), alcohol-related (n = 2,505), and mental health (n = 1,960), together comprising the majority of activations. Most incidents were managed at the basic life support (BLS) level, particularly injury/trauma (51.10% BLS), alcohol-related (52.81% BLS), and respiratory/infectious complaints (63.39% BLS), indicating that transport-capable BLS resources account for most operational workload. Advanced life support (ALS) utilization was concentrated in neurological (57.14%), cardiovascular (50.47%), and allergy (47.84%) presentations, representing smaller but higher-acuity subsets that require paramedic-level coverage. Average on-scene times were consistent across categories (15.9–18.8 minutes), suggesting that system strain is driven primarily by call volume rather than prolonged case complexity. Temporal clustering during late-night and weekend hours further indicates predictable surge periods. Collectively, these findings support staffing models emphasizing BLS-focused coverage with strategically positioned ALS resources and targeted nighttime deployment. Limitations include the retrospective design and reliance on administrative location coding within NEMSIS. Future work incorporating severity measures and patient outcomes may further refine staffing strategies and quantify the impact of campus EMS programs on municipal system utilization.

References

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