

Future of Emergency Medicine – People

To predict future changes to the emergency physician (EP) workforce, we must first understand the current state of US emergency departments (EDs), together with key drivers of workforce demand, such as non-physician providers and telehealth. There are multiple factors that influence the future supply and use of EPs, including the number of EPs trained annually, the age at which EPs stop providing emergency care, changes in workflow and staffing of EDs, the use of physician assistants (PA) and nurse practitioners (NP), the volume of ED visits (including illness patterns and demographics of the population), and the geographic distribution of EPs. The number of ACGME-accredited emergency medicine (EM) residencies has grown from 159 in 2011 to 265 programs in 2020, with a commensurate increase in graduating trainees of 1613 in 2011 to 2665 in 2020¹. Some of that growth was due to the addition of osteopathic programs to the Accreditation Council for Graduate Medical Education (ACGME) in 2015-2017.

The National Emergency Department Inventory (NEDI)-USA has been monitoring EDs for 20 years, with a goal of determining the number, distribution, and basic characteristics of US EDs.^{2,3} The long-term goals of the NEDI program are to develop an ED categorization system, identify potential gaps in ED coverage, and make data-driven recommendations for ED-related health policy. The NEDI-USA data indicate that the absolute number of EDs and total ED visit volumes have steadily increased over time (*Table 1*). However, US EDs are heterogeneous and often have different workforce needs. Policies that work in one state or community may not be effective for others.

The distribution of EDs by annual visit volume is shown in *Figure 1*. EDs in the Central Plains tend to be rural and have smaller visit volumes. Regardless of visit volume, rural emergency care includes acutely ill patients who may require complex care and hospital closures can cause serious gaps in emergency care. Fortunately, critical access hospitals are more likely to “survive” because of their Federal support.

The EP workforce has changed over time. While the number of physicians has grown, the distribution of those physicians remains problematic, with relatively few practicing in the rural setting. In the mid-2000s, only 62% of EPs were EM-trained or EM board certified.⁴ At that time, the IOM recognized that the 38% of EPs without EM training or board certification represented an “essential component of ED workforce”, particularly for smaller rural EDs.

Authors

Carlos A. Camargo, Jr., MD, FACEP

Department of Emergency Medicine, Massachusetts General Hospital, Harvard Medical School, Boston, MA

Daniel Freess, MD, FACEP

Department of Emergency Medicine, Harford Hospital, Hartford, CT

Catherine A. Marco, MD, FACEP

Department of Emergency Medicine, Wright State University, Dayton, OH

Randy Pilgrim, MD, FACEP

SCP Health, Lafayette, LA

Liam Yore, MD, FACEP

Department of Emergency Medicine, EvergreenHealth, Kirkland, WA

William P. Jaquis, MD, FACEP

Department of Emergency Medicine, Aventura Medical Center, Aventura, FL

The number of emergency physicians has increased from 39,061 in 2008 to 48,835 in 2020.^{5,6} The percentage of those with EM training or EM board certification has increased as well, rising from 69% to 81%. However, the distribution of those physicians has not changed significantly (*Table 2*). The 2009 workforce study concluded that many non-EM trained/board certified physicians still provide clinical coverage of EDs in the US, that the demand for EPs would continue for several decades, and the shortage may even worsen in rural areas. *Figure 2* shows the distribution of those EPs across the USA.⁶ Despite a dramatic increase in the number of EPs, there remains a shortage of EPs, especially in the Central Plains and South. In small rural areas, 25% of the EPs are over the age of 68.

Over the past decade, there also has been an increase in the use of PAs and NPs as a part of the health care team to provide emergency care. In 2009, 15% of emergency visits were seen by PAs and NPs, with 40% of those visits being seen without direct physician supervision.⁷ By 2016, 26% of all ED visits are seen by NPs/PAs and 46% of those are without physician involvement.⁸ Taken together with the EP findings, these data support greater flexibility in our delivery models in how to provide timely, high-quality emergency care to all Americans.

ACEP, along with our partners (the American Board of Emergency Medicine, the American Osteopathic Board of Emergency



Future of Emergency Medicine – People

Medicine, the American College of Osteopathic Emergency Medicine, the Council of Residency Directors for Emergency Medicine, the Emergency Medicine Resident Association and the Society for Academic Emergency Medicine) have developed an Emergency Physician Workforce Task Force, chaired by Dr. Catherine Marco. Partnering with a third-party workforce expert, they have built several models for the future supply and use of EPs, PAs, NPs, and other ED-based clinicians over the next decade. Their final report is expected in 2021. Following a description of the current Workforce in Emergency Medicine, they plan to propose several projections for the future EP workforce.

PAs and NPs

ACEP policy reflects the ideal that all emergency care should be provided or directed by EPs who are board certified by the American Board of Emergency Medicine, American Osteopathic Board of Emergency Medicine, or American Board of Pediatrics. More recently though, at least 25% of emergency care is provided at least in part by NPs and PAs, with half of these encounters occurring without physician involvement or supervision. Currently, 32 states now permit some degree of independent practice for NPs.

Though independent practice by PAs and NPs is not recommended, PAs and NPs with proper supervision can provide a functional expansion of the workforce in urban, suburban, and rural environments. While direct and indirect supervision allow for EP oversight and involvement in patient care, active onboarding and ongoing EM-specific continuing medical education for PAs and NPs are necessary to create a well-functioning and high-quality emergency medical team. When EPs and local EM leadership are involved in these processes, most feel that they have sufficient control and guidance over their individual team. It is thus important for PA and NP supervision, training, and management to be an active rather than a passive process for EPs in order to safely and effectively use PAs and NPs to expand the EM workforce.

As reflected by distribution trends noted above, EPs prefer to work in more urban areas. Though PAs and NPs share that preference, a slightly higher proportion of PAs and NPs (as compared to EPs) work in rural environments.⁹ While there is no direct research on clinical priorities, ideals, and recruitment, it appears from the opinions and experience of those involved that PAs and NPs are more likely than physicians to respond to equivalent monetary incentives, and that some rural hospitals struggle to be able to afford physician salaries compared to those of PAs and NPs.

If properly trained and supervised, PAs and NPs with EP supervision and oversight may potentially provide more cost-effective

care than physicians alone in some rural and underserved areas. Such care should be provided under the supervision of a physician with proper matching of clinician type to the patient volume, clinical acuity, and available resources. Telehealth can be used to provide supervision and enhance quality of care. To support this key workforce while assuring appropriately skilled and competent care, EPs should increase involvement in PA and NP training, practice, and supervision.

Telehealth

The promise of telehealth is compelling for many reasons, including expanded access to care, practice efficiencies, and cost-effectiveness. Telehealth utilization in the ED may have implications for the future of the EM workforce. To assess potential implications, we must assume that the technology is functional and available, that patients will use it, that clinicians will adopt it, and that hospitals and payment systems will support it. Not all of this will occur smoothly, nor simultaneously, but these assumptions clarify telehealth's fundamental impact on the EM workforce of the future.

For EM, telehealth's impact can be divided into two main categories: (1) standard functions in the ED, and (2) new or emerging functions that involve EPs. Standard functions include virtual triage, virtual medical screening exams, virtual surge capacity (seasonal or peak hours), specialty care, and consultative services. These functions provide important opportunities for efficiencies and augmentation of the current EM workforce. However, the addition of telehealth functionality for "standard" functions will probably not overcome the large workforce deficits and workforce distribution challenges previously mentioned.

Emerging applications of telehealth for ED practices leverage the unique contributions of the ED to the greater health care delivery system. These applications primarily impact settings outside the hospital including ED follow-up care, virtual nursing home assessments, remote collaboration (including rural settings), EMS 'treat-in-place' protocols, post-acute interventions, non-emergency care, and virtual care such as that provided during the COVID-19 pandemic. In addition, ACEP's Acute Unscheduled Care Model (AUCM) applies to emergency care outside the four walls of the hospital for 30 days after a qualifying ED visit,¹⁰ where telehealth applications may play a key role.

Emerging applications may affect the numbers of EPs required in the future, but perhaps more importantly, it may affect the type of work that will be required. The typical EM practice will likely evolve from an episodic, point-of-care approach to a practice patterns that more fully embraces a broader continuum of care. Clinicians will need to focus not only on quality care patient-by-patient, but also on



Future of Emergency Medicine – People

the efficient use of the health care delivery system as a whole. EPs will need community health and value-based mindsets, and in order to address underserved geographies, a “distributive” mentality. In addition, specific telehealth skills will be required, which are similar but not identical to those required at the bedside.

Clearly, the alignment of health care systems and payment policies are critical in this transformation and will either accelerate or obstruct progress. However, it is unlikely that emerging applications of telehealth – even under ideal conditions – will substantially relieve the demand for EPs in the future. While telehealth may decrease ED volumes for some low-acuity conditions, it may also release pent-up demand for care, provide for opportunistic access for patients, or effectively create greater average acuity in EDs, none of which would reduce the need for high-quality EPs.

COVID-19

The immediate effect of COVID-19 on emergency medicine has been profound and recovery will take time. The pandemic may also positively or negatively affect our ability to recruit future physicians into the specialty. The pandemic has put the skills and value of EPs into sharp focus. For years we have been the safety net and have worn the white hat, but COVID-19 has advanced perceptions of us as heroes, and as men and women who put their own lives

on the line. ACEP members have been in the media, increasing our specialty’s prestige and high regard. We believe that this will be a great asset in our ability to develop future EM leaders from the next generation of medical students. While some medical students may have valid concerns about the risk of contagion and death, many will continue to be drawn to EM.

ED volumes fell drastically early in the pandemic but in most areas have now returned to 80-90% of prior volumes. It has not returned to 100% of volume though and there is concern that the visit volume decrease may be permanent or at least take significant time to return.

COVID-19 will likely function as an accelerator of pre-existing trends. Telehealth is here to stay and along with urgent care and retail centers will likely influence our lower acuity patients. Our patients will likely be sicker with higher complexity of care. Some older EPs may choose to retire earlier than planned. However, the underlying needs for emergency care in our communities have not changed, there is continued job security for EPs. While COVID-19 has had an incredibly disruptive effect in the short-term, and may act as a brake on the future growth in patient volumes, we believe that, in the long-term, the need for EPs will continue to increase. ■



Future of Emergency Medicine – People

Table 1

US emergency departments by annual visit volume, overall and in selected states³

	USA		2017 State Examples		
	2001	2017	MA	TX	SD
Total EDs	4,862	5,455	73	804	51
Total ED visits	101,555,199	159,531,391	3,210,026	15,205,371	269,282
Annual ED visits					
<10,000 visits	35%	30%	1%	55%	86%
10-19,999 visits	24%	17%	21%	12%	8%
20-29,999 visits	17%	13%	8%	13%	2%
30-39,999 visits	10%	11%	2%	6%	0
40-49,999 visits	6%	9%	15%	5%	2%
50,000+ visits	8%	20%	34%	10%	2%
Median ED visits	15,711	20,805	38,758	9,106	2,000

Abbreviations: ED, emergency department; MA, Massachusetts; TX, Texas; SD, South Dakota.

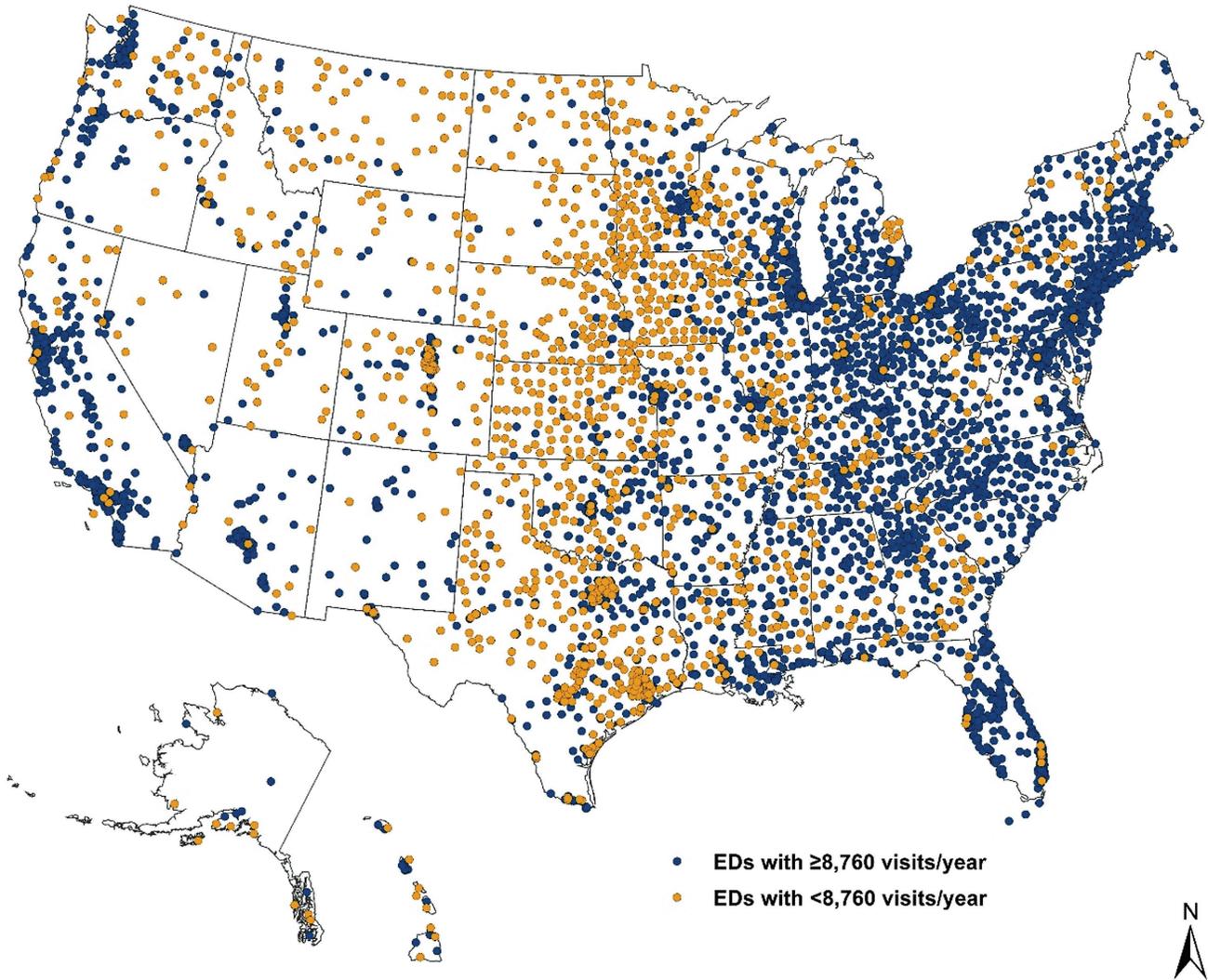


Future of Emergency Medicine – People

Figure 1

Distribution of US emergency departments by annual visit volume.³

One visit/hour x 24 hours/day x 365 days/year = 8,760 visits/year



Abbreviations: ED, emergency department.



Future of Emergency Medicine – People

Table 2

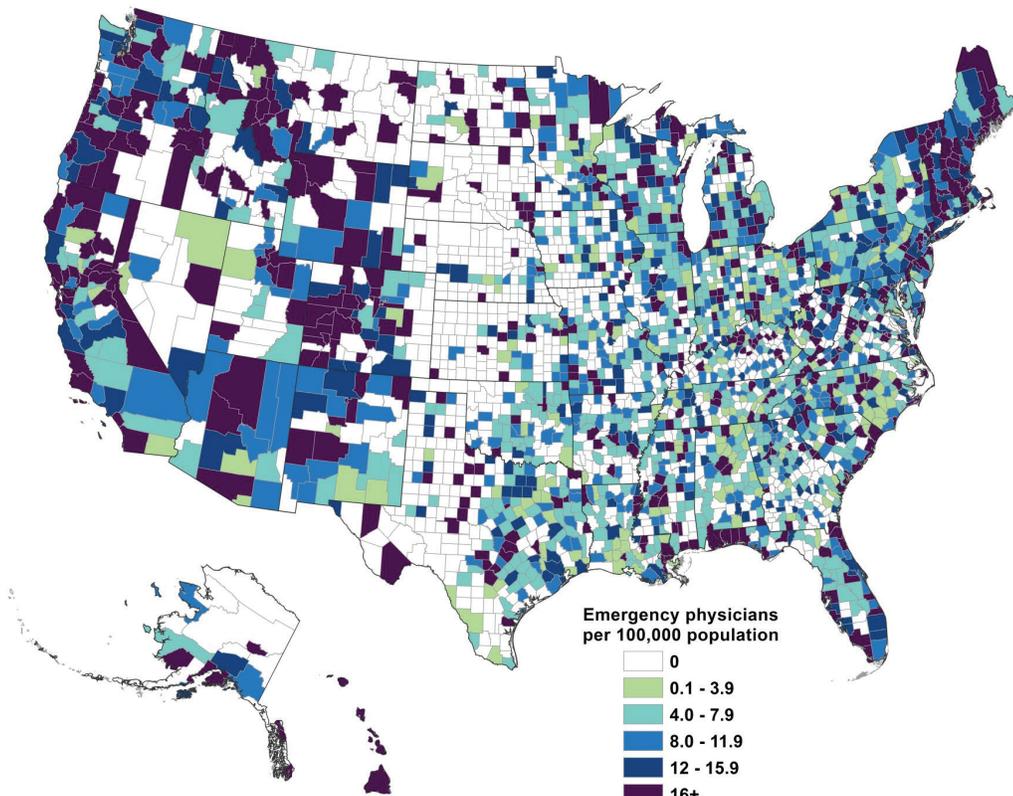
Characteristics of the US emergency physician workforce over time

	2008 ⁵	2020 ⁶
Clinically-active EPs	39,061	48,835
% EM trained/BC	69% (1 in 3)	81% (1 in 5)
Density of EM trained/BC EPs		
(per 100k population)	8.8	11.8
Urban	10.3	12.9
Large rural	5.3	6.3
Small rural	2.5	2.8
Change in density of all EPs (per 100k population)		
Urban	--	+ 1.4
Large rural	--	- 0.4
Small rural	--	- 3.7
Median age of EPs (years)		
Urban	48	50
Large rural	54	58
Small rural	56	62
Background of non-EM trained/BC EPs		
Family Medicine	31%	33%
Internal Medicine	23%	24%

Abbreviations: EP, emergency physician; EM trained/BC, emergency medicine trained or board certified.



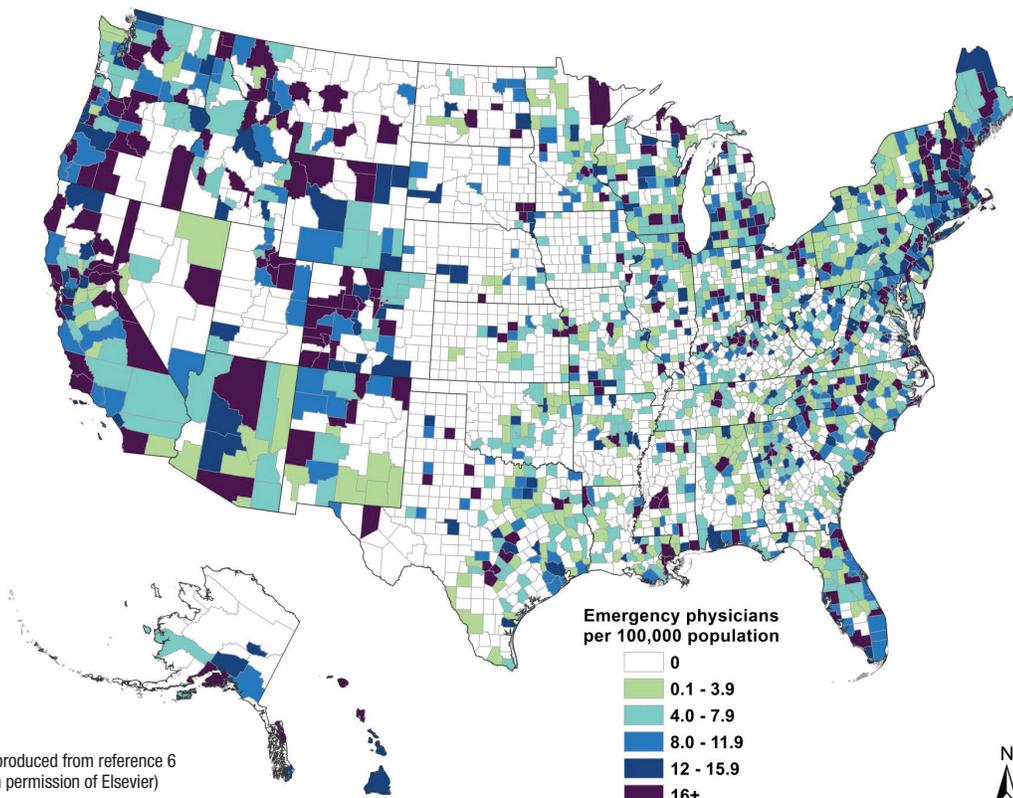
Future of Emergency Medicine – People



A. All emergency physicians

Figure 2

Emergency physician density per 100,000 population by county.



B. Emergency medicine-trained or emergency medicine board-certified emergency physicians.

(Reproduced from reference 6 with permission of Elsevier)





Future of Emergency Medicine – People

References

1. Accreditation Council for Graduate Medical Education: Emergency Medicine Programs. Available at: <https://apps.acgme.org/ads/Public/Reports/ReportRun>
Accessed 9/24/2020.
2. Sullivan AF, Richman IB, Ahn CJ, Auerbach BS, Pallin DJ, Schafermeyer RW, Clark S, Camargo CA Jr. A profile of U.S. emergency departments in 2001. *Ann Emerg Med* 2006; 48: 694-701.
3. Emergency Medicine Network. National Emergency Department Inventory (NEDI) Website. Available at: <https://www.emnet-usa.org/research/studies/nedi/>
Accessed: 9/24/20.
4. Institute of Medicine Committee on the Future of Emergency Care in the US Health System. *Hospital-Based Emergency Care: At the Breaking Point*. Washington, DC: National Academies Press; 2006.
5. Ginde AA, Sullivan AF, Camargo CA Jr. National study of the emergency physician workforce, 2008. *Ann Emerg Med* 2009; 54: 349-359.
6. Bennett CL, Sullivan AF, Ginde AA, Rogers J, Espinola JA, Carson CE, Camargo CA Jr. National study of the emergency physician workforce, 2020. *Ann Emerg Med* 2020; 76: 695-708.
7. Brown DFM, Sullivan AF, Espinola JA, Camargo CA Jr. Continued rise in the use of mid-level providers in US emergency departments, 1993-2009. *Int J Emerg Med* 2012; 5: 21.
8. Camargo CA Jr, Hasegawa K, Temin ES, Sullivan AF, Espinola JA, Brown DFM. Continued rise in the use of advanced practice providers in US emergency departments, 1993-2016 [abstract]. *Acad Emerg Med* 2020; 27 (S1): S13.
9. Hall MK, Burns K, Carius M, Erickson M, Hall J, Venkatesh A. State of the national emergency department workforce: who provides care where? *Ann Emerg Med* 2018; 72: 302–307.
10. American College of Emergency Physicians. Acute Unscheduled Care Model. Available at: <https://www.acep.org/federal-advocacy/federal-advocacy-overview/APM/>
Accessed 9/24/20.