

**Title of Manuscript:**

**Too Big Too Fast? Potential Implications of the Rapid Increase in Emergency Medicine  
Residency Positions**

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**Running Title:** Too Big Too Fast?

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1002/AET2.10400](https://doi.org/10.1002/AET2.10400)

**Keywords:** Graduate Medical Education, Workforce, Physician shortage

**Word Count:** 3,853 (not including abstract or figure legends)

**Presentations:** None

**Financial support:** There are no funding sources to disclose.

**Disclosures:**

MRCH has no conflicts to disclose.

BJZ receives royalties from the book: *Anyone, Anything, Anytime – A History of Emergency Medicine*, 2<sup>nd</sup> edition. Published by the American College of Emergency Physicians.

LRH has no conflicts to disclose.

**Author Contributions:** BJZ developed the concept for the paper. MRCH drafted the manuscript and all authors contributed substantially to its revision. LRH additionally contributed to the statistical analysis and development of the graphs. MRCH takes responsibility for the paper as a whole.

**Acknowledgments:** None

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Article type : Concept Paper

**TITLE:** Too Big Too Fast? Potential Implications of the Rapid Increase in Emergency Medicine Residency Positions

**ABSTRACT:** Emergency medicine has expanded rapidly since its inception in 1979. Workforce projections from current data demonstrate a rapid rise in the number of accredited emergency medicine residency programs and trainee positions. Based on these trends, the specialty may soon reach a point of saturation, particularly in urban areas. This could negatively impact future trainees entering the job market as well as the career plans of medical students. More time and resources should be devoted to obtaining accurate projections, assessing the distribution of emergency physicians in rural versus urban settings, and implementing central workforce planning to protect the future of graduating trainees.

**INTRODUCTION**

Emergency medicine (EM) has been undergoing a rapid expansion in the number of residency training spots. The long-term implications are unclear, raising several questions: Is EM growing too big, too fast? What happens when the number of annual residency graduates exceeds the number of available job positions? Will the rapid increase in residency programs harm trainees aiming to secure a position post-residency in what may become a saturated job market? Will concerns about the job market affect medical student specialty selection? What are the implications for the specialty should such a mismatch of supply-and-demand occur? The intent of this paper is to raise awareness of potential challenges for EM as it completes its evolution into a mature specialty.

**BACKGROUND**

33 An understanding of the historical development of EM helps to illuminate the current state of  
34 training in the field. EM emerged in the 1960s, after the need for specialized emergency care was  
35 finally recognized in the post-World War II era.<sup>1</sup> The specialty initially struggled to achieve  
36 formal recognition.<sup>1</sup> In 1968, The American College of Emergency Physicians (ACEP) was  
37 founded by several emergency physicians (EPs), with the establishment of the first EM  
38 residency-training program quickly following in 1970 at the University of Cincinnati.<sup>1</sup> By 1975,  
39 35 EM residencies had been established.<sup>1</sup> In 1976, The American Board of Emergency Medicine  
40 (ABEM) was incorporated out of ACEP, and worked with the University Association for  
41 Emergency Medicine (UAEM), the early academic EM organization, to develop a certification  
42 process for the specialty of EM.<sup>1</sup> EM ultimately achieved formal recognition as the 23rd primary  
43 medical specialty by the American Board of Medical Specialties (ABMS) in 1979.<sup>1</sup> In 1978, the  
44 formation of the American Osteopathic Board of Emergency Medicine (AOBEM) marked the  
45 emergence of osteopathic physicians within the field of EM.<sup>1</sup>

46  
47 In 1995, a landmark conference sponsored by the Josiah Macy, Jr., Foundation was held in  
48 Williamsburg, Virginia to discuss the role of EM in the future of American medical care.<sup>2</sup> The  
49 proceedings from the conference acknowledged the shortage of board-certified EPs at the time.<sup>2</sup>  
50 Several resulting recommendations impacted the expansion of EM. The report recommended that  
51 government organizations maintain an adequate number of EM residency positions in the face of  
52 a changing healthcare landscape.<sup>2</sup> The report also recommended that all medical schools  
53 establish appropriately staffed and supported academic emergency departments (EDs).<sup>2</sup> An  
54 additional recommendation advised that every medical student acquire the knowledge and skills  
55 to care for ED patients through experiences supervised by qualified EPs.<sup>2</sup> At the time of the  
56 report, fewer than 20% of U.S. medical schools offered required EM clerkships.<sup>2</sup> A subsequent  
57 1997 article evaluating the EM workforce predicted that supply of EPs would not equal demand  
58 until 2020, and called for the creation of additional EM residency programs to bridge the gap.<sup>3</sup>

59  
60 Recent declarations of an overall impending physician shortage have also driven the expansion  
61 of EM. The American Association of Medical Colleges (AAMC) has predicted the shortage  
62 based on an aging physician workforce and rising demand by an aging patient population with  
63 increasing medical needs.<sup>4</sup> A 2018 study anticipated a shortage of between 42,500 and 121,300  
64 physicians in the U.S. by 2030.<sup>5</sup> Concern over inadequate supply of future physicians has

65 resulted in requests for additional funding to increase the number of trainee positions available  
66 for all specialties, including EM.<sup>5</sup>

67  
68 As a result of this milieu, academic EM has expanded rapidly. The number of academic EDs has  
69 increased from 18 in 1989, to at least 115 accounted for in a 2018 AAMC faculty roster of  
70 department chairs.<sup>6,7</sup> As of 2017, the number of U.S. allopathic medical schools requiring EM  
71 clerkships had increased to 56%.<sup>8</sup> Similarly, the number of EM residency programs has  
72 increased from 82 in 1990 to 239 in 2018.<sup>9</sup> One study found that nearly 75% of EM bound  
73 students come from medical schools with an affiliated EM residency program.<sup>10</sup>

74  
75 The historical factors and trends that have resulted in the rapid expansion of EM have been  
76 applauded as addressing the feared physician shortage and improving patient access to  
77 unanticipated emergency care.<sup>11,12</sup> However, the potential negative downstream effects of rapidly  
78 increasing the supply of EPs in the setting of potentially changing demand must also be  
79 considered.

80

## 81 **CURRENT AVAILABLE DATA AND PROJECTIONS**

### 82 **Assessing supply**

83 The 2019 National Resident Matching Program (NRMP) Main Residency Match numbers were  
84 reviewed, including the number of first-year positions offered by EM and the fill rate. These  
85 numbers were compared to previous years to assess the rate of increase in the number of offered  
86 positions. Overall, the number of residency programs and trainee positions has rapidly increased  
87 for nearly all specialties, making the 2019 NRMP Main Residency Match the largest Match on  
88 record.<sup>13</sup> EM specifically has also undergone a rapid expansion in the number of training  
89 programs and residency positions available, and now represents 7.7% of available PGY-1  
90 positions [Figures 1 and 2].<sup>13</sup> Since 2014, the number of EM positions has increased  
91 dramatically by 702 (36.6%).<sup>13</sup> In the 2019 Match, EM offered 2,488 first-year positions, which  
92 is 210 more than 2018, which itself was 231 more than 2017.<sup>13</sup> EM did fill all but 30 positions at  
93 15 programs for a fill rate of 98.8%.<sup>13</sup> The percentage filled by U.S. allopathic seniors, however,  
94 continued a downward trend and is now only 65.0%.<sup>14</sup> The merger of the Accreditation Council  
95 for Graduate Medical Education (ACGME) and American Osteopathic Association (AOA) and  
96 the resultant movement of osteopathic students into the NRMP Main Match likely accounts for

97 some of the decrease in fill rate by U.S. allopathic seniors. However, despite the increase in  
98 residency positions, the number of U.S. Seniors matching into EM has essentially plateaued over  
99 the last three years, raising potential concerns about saturation of the specialty among allopathic  
100 students.<sup>14</sup>

101  
102 As the number of EM trainee positions has increased, so has the number of physicians who  
103 trained in an EM residency and subsequently completed board certification (ABEM and  
104 AOBEM diplomates). Data was obtained from both ABEM and AOBEM. Commensurate with  
105 the development of the specialty, the number of active ABEM diplomates has increased from  
106 2,852 to 36,926 from 1984 to 2019 (email communication, October 10, 2018).<sup>15</sup> Combined with  
107 the current number of roughly 4,100 AOBEM-certified physicians (email communication,  
108 October 20, 2018), this represents approximately 41,026 board-certified EPs, the vast majority of  
109 whom can be assumed to be in active clinical practice.

#### 110 111 Assessing Demand

112 Projections of demand were assessed from previous reports in the literature. A 2016 article by  
113 Reiter et al. evaluating workforce trends projected that there can be enough ABEM/AOBEM-  
114 certified or eligible physicians to comprise the entire EP workforce by 2021, when accounting  
115 for both board-certified and board-eligible EPs anticipated to become board-certified.<sup>16</sup> This  
116 projection was based on a 1.7% attrition rate estimated from a 2008 American Medical  
117 Association physician Masterfile.<sup>17</sup> The projections from Reiter et al. also correlate with a recent  
118 Health Resources and Services Administration (HRSA) article which anticipated a discrepancy  
119 between demand and supply, with demand for EPs projected to grow at 9% versus supply  
120 growing at 18% between 2013 and 2025.<sup>18</sup> Of note, the HRSA data includes self-reported EPs,  
121 some of whom may not be residency-trained or board-certified in EM.<sup>18</sup>

122  
123 The demand for EPs will continue to be a complex and dynamic equation, with several evolving  
124 variables. For instance, the role of advanced practice providers (APPs) also affects EP supply  
125 and demand. Between 2013 and 2015, physician assistant (PA) supply in EM was projected to  
126 almost double during the same period that demand was expected to grow by only 9%.<sup>18</sup> The  
127 interplay of APP supply-and-demand and EP supply-and-demand may impact the EM workforce  
128 in ways that are difficult to predict. The phenomena of the commoditization of the profession,

129 whereby tasks previously in the exclusive domain of the physician are now being forced to the  
130 lowest provider on the ladder competent to provide the service, will result in the need to redefine  
131 the role and utility of the EP relative to other health care professionals.<sup>19</sup> Potential policy  
132 changes loosening supervision requirements and increasing independent practice of APPs may  
133 also reduce demand for EPs.

134  
135 Additional factors with the potential to impact EP demand include an aging patient population  
136 and changes in physician utilization, health insurance coverage, and availability of primary care.  
137 The increase in freestanding emergency departments (FSEDs), which are located physically  
138 separate from a hospital, may increase demand as ACEP guidelines advise they be staffed by  
139 qualified EPs.<sup>20</sup> As of 2017, between 550 and 600 FSEDs were reported, compared to only 80 in  
140 2007.<sup>21,22</sup> FSEDs have been postulated to reduce the burden of crowding on traditional hospital-  
141 based EDs by drawing in lower-acuity patients and potentially improving access to care in rural  
142 areas where financial strain has reduced the number of critical access hospitals.<sup>23</sup> A recent  
143 analysis of the current state of FSEDs, however, suggests that they may cater to a more affluent  
144 patient population rather than address a lack of access to emergency care in underserved  
145 areas.<sup>23</sup> The role and impact of FSEDs within the larger system of emergency care thus remains  
146 uncertain and continues to evolve. Similarly, urgent care centers (UCCs), walk-in clinics focused  
147 on the delivery of medical care for minor illnesses and injuries, may also shunt patients with  
148 lower-acuity conditions away from traditional hospital-based EDs or FSEDs.<sup>24</sup> One study  
149 estimated that 13.7-27.1% of all ED visits could take place at UCCs and retail clinics with an  
150 estimated potential cost savings of approximately \$4.4 billion annually.<sup>25</sup> While some UCCs are  
151 staffed by EPs, the majority of these facilities are staffed by primary care physicians and APPs.<sup>24</sup>  
152 The increase in UCCs could thus have variable effects on EP demand. Although EM attrition  
153 rates have been found to be relatively low and compare favorably to other specialties, changes in  
154 retirement age and practice hours per week may also occur as a new generation of EPs emerges,  
155 further impacting demand.<sup>17</sup> Furthermore, the evolution of technology and development of new  
156 health care delivery modes and settings will increase the need for flexibility among physicians,  
157 including the ability to develop new skills and transition to new modes of practice.<sup>19</sup> For  
158 instance, applications of telemedicine, defined as “the delivery of health care services at a  
159 distance, using information and communication technology,” have rapidly expanded within  
160 EM.<sup>26,27</sup> Telemedicine may impact workforce dynamics by effectively enhancing supply of EP

161 expertise to small and rural hospitals.<sup>26</sup> Additionally, the ACGME has questioned whether the  
162 traditional dichotomous model of generalist and specialist physicians is still the best way to  
163 approach planning for future medical education.<sup>19</sup> The lines between who is competent and  
164 available to provide urgent or emergent care may blur, also affecting demand for EPs.<sup>19</sup> More  
165 detailed explorations of the potential effects of such factors have been previously  
166 published.<sup>19,28,29</sup>

167  
168 When assessing demand, it is also important to recognize that despite overall ED visits  
169 increasing by 40% over the last two decades, the number of EDs has simultaneously decreased  
170 by 11%.<sup>30</sup> The demand for additional EPs may be attenuated by the trend toward ED closures at  
171 small hospitals, as visits from the closed EDs are usually consolidated into larger regional EDs in  
172 pursuit of economies of scale.

173

#### 174 **IMPLICATIONS OF WORKFORCE PROJECTIONS**

175 EM residencies in the U.S. are currently able to produce nearly 2,500 graduates per year with  
176 additional proposed residency programs in the pipeline for approval. The data cited above raises  
177 concerns that the EM workforce has the potential to soon reach a point of saturation. To better  
178 align the supply of EPs with future demand, the specialty must turn its attention to central  
179 workforce planning. Failing to do so could result in negative consequences on the EM workforce  
180 as have occurred in other parts of the world. For example, Australia has witnessed a similar  
181 explosion in popularity of EM in the absence of a central workforce planning system to provide  
182 feedback about supply and demand forces or to limit the number of trainees accepted into EM.<sup>31</sup>  
183 The rapid growth in the number of EPs has even outstripped the rising number of ED visits.<sup>31</sup>  
184 This has negatively impacted the workforce through the phenomenon of “exit block,” where  
185 graduating trainees are unable to find jobs, as well as “zero-hours” contracts, where employed  
186 EPs are not guaranteed regular shifts.<sup>31</sup> Several additional concerns have been raised, including  
187 dilution of training experiences and the graduation of trainees not well-suited for EM.<sup>31</sup>

188

189 National planning for the EP workforce is required to provide a stable environment where  
190 medical students will be confident that they can find a job when they complete residency  
191 training. Grover et al. noted that a distinguishing feature of the physician workforce is that it  
192 relies partly on the collective result of individual physician’s personal choices, including where



193 and what to study, and where to train and practice.<sup>32</sup> Such factors can affect the workforce more  
194 profoundly than any government initiative.<sup>32</sup>

195  
196 The specialty of anesthesiology offers a cautionary tale of how projections of oversupply can  
197 influence the career choices of medical students and physicians and massively impact the  
198 workforce. In the late 1980's and early 1990's, anesthesiology residency programs and positions  
199 greatly expanded, with the number of graduates quadrupling between 1984 and 1993.<sup>33</sup> In 1994,  
200 the American Society of Anesthesiologists commissioned a study which projected a major  
201 oversupply of anesthesiologists in the coming decades.<sup>33,34</sup> Simultaneously, the Council on  
202 Graduate Medical Education (COGME) advocated for efforts to increase the number of primary  
203 care physicians and limit the number of U.S. specialty physician trainees.<sup>33</sup> A Wall Street Journal  
204 article and other media accounts highlighted difficulties experienced by graduating  
205 anesthesiology seeking jobs.<sup>35</sup> In response to these factors, medical students rapidly moved away  
206 from anesthesiology as a specialty choice, with the number of U.S. medical school applicants to  
207 anesthesiology plummeting by 56% from 1995 to 2000 (from 1,784 to 787).<sup>34</sup> Although the drop  
208 in applicants choosing anesthesiology was somewhat tempered by a large increase in  
209 international medical graduates matching into the specialty and growing numbers of certified  
210 nurse anesthetists, the resultant shortage of anesthesiologists persists today.<sup>33,34</sup> Medical students'  
211 perceptions regarding job opportunities, income, and lifestyle factors are key drivers in their  
212 specialty selection.<sup>36</sup> As the anesthesiology experience has shown, if those perceptions turn  
213 negative, the consequences can be rapid and enduring.

214  
215 The rapid rise in the number of EM training positions has been more prevalent in certain areas of  
216 the country. For example, the state of Florida has demonstrated a particularly dramatic increase  
217 in the number of EM training positions, many offered by for-profit hospitals and large, corporate  
218 medical groups (CMGs).<sup>37-39</sup> Since 2013, the number of EM residency slots in Florida has  
219 increased by more than 200%, compared to an only 20% increase in residency positions in all  
220 specialties between 2013-2017.<sup>40-42</sup> In 2018, an additional 3 EM residencies were approved by  
221 the RRC-EM in Florida.<sup>43,44</sup> A 2019 article in the Florida College of Emergency Physicians  
222 (FCEP) newsletter EM Pulse argued that there is little evidence to support that a critical shortage  
223 of EPs ever existed in Florida to justify this rapid expansion of EM training spots.<sup>44</sup> The authors  
224 concluded that resources would be better shunted toward increasing access to primary care and

225 that EM should not have been added to the list of “critical shortage specialties” on the 2013  
226 Florida state legislative bill SB 1500.<sup>44</sup>

227  
228 Although the current data presented in this article do not support an impending overall shortage  
229 of EPs, rural areas do continue to see a shortage of EPs when compared to urban and suburban  
230 settings.<sup>45</sup> A 2014 study evaluating Medicare data found that EPs comprise 63.9% of the  
231 emergency clinician workforce in urban counties, versus only 44.8% of the workforce in rural  
232 counties where a greater proportion of nonemergency physicians and APPs practice.<sup>46</sup> The study  
233 identified several factors driving this disparity, including location of residency programs, which  
234 tend to be more concentrated in urban areas.<sup>46</sup> Additional factors reported by EM residency  
235 graduates as strongly influencing the decision to practice in urban versus rural environments  
236 include lifestyle, access to amenities/recreation, ED volume/acuity, and family/spouse.<sup>47</sup> Many  
237 of these factors are not easily amenable to change. Concomitant with the relative shortage of EPs  
238 in rural areas is a relative increase in ED visits to rural EDs demonstrated by a recent cross-  
239 sectional study of National Hospital Ambulatory Medical Care Survey data.<sup>48</sup> While rural ED  
240 visits increased by more than 50% from 36.5 to 64.5 per 100 persons, urban ED visits stayed  
241 relatively stable, increasing from only 40.2 to 42.8 visits per 100 persons from 2005 to 2016.<sup>48</sup>  
242 This suggests that there may not be a need to train additional EPs who are most likely to pursue  
243 jobs in urban ED environments, but rather a need to direct trainees toward rural ED settings.  
244 Rural training opportunities have the potential to significantly impact selection of rural practice  
245 settings as has been demonstrated in family medicine residents, including for those raised in  
246 urban areas.<sup>49,50</sup> Although the shortage of rural training opportunities may be due to the  
247 perception that patient volume in rural EDs is inadequate for Residency Review Committee for  
248 Emergency Medicine (RRC-EM) requirements, at least one study has found that patient volumes  
249 per physician were similar in rural and urban settings.<sup>51</sup> An article by Handel et al. provides  
250 valuable recommendations for shunting trainees to rural areas, including creating financial  
251 incentives for residents to enter a rural EM practice through assistance with educational debt via  
252 government and/or hospital support, adjusting the RRC-EM guidelines to permit training  
253 experiences that offer a rural EM component, and supporting innovative delivery of rural  
254 emergency care under supervision by EPs at academic medical centers via telemedicine.<sup>52</sup>  
255 Leaders within EM will need to discuss and arrive at a consensus over whether educational  
256 initiatives will follow the recommendations set forth by Handel et al. to address the relative

257 shortage of rural EPs or accept the greater proportion of nonemergency physicians and APPs  
258 filling the void in these areas.

259  
260 In addition to affecting the ability of EM residency graduates to secure jobs upon the completion  
261 of training, an overabundance of EM residency positions could have wider-ranging implications  
262 for population health. The AAMC has projected a primary care (including family medicine,  
263 general internal medicine, general pediatrics and geriatric medicine) physician shortage of  
264 21,100 to 55,200 physicians by 2032.<sup>53</sup> Additionally, the AAMC continues to project especially  
265 significant shortages in surgical specialties and other specialties, such as psychiatry.<sup>53</sup> One study  
266 evaluating influences on medical students' choice of EM found that internal medicine, general  
267 surgery, anesthesiology, family medicine, and pediatrics were in the top five most common  
268 specialties considered as either a student's first or second alternative.<sup>10</sup> Individuals who may  
269 have otherwise chosen a specialty in need of additional manpower will have devoted time and  
270 resources to training in one that is already oversupplied. Additionally, educational debt continues  
271 to be a primary factor deterring college students from pursuing a career in medicine, particularly  
272 for underserved minorities.<sup>54</sup> The AAMC estimated that the class of 2018 graduated with a  
273 median debt of \$200,000, up 4% from the previous year.<sup>55</sup> EM residency graduates unable to  
274 find a suitable job due to oversupply will face increased difficulty paying off student loans.  
275 Witnessing this phenomenon could further discourage young, bright minds of diverse  
276 backgrounds with the potential to advance medicine from applying to medical school.

277  
278 History also demonstrates the cyclical nature of workforce projections, with the last century  
279 providing several examples of conflicting opinions on whether or not a shortage or oversupply is  
280 projected.<sup>32</sup> The difficulty in formulating accurate projections is in part due to the many  
281 assumptions required to calculate them. As previously mentioned, our goal is to highlight  
282 potential challenges for the EM workforce and call for additional study to assess the implications  
283 of the rapid expansion of EM training programs as well as societal needs. A comprehensive,  
284 detailed workforce projection is beyond the scope of this work and excellent examples are  
285 available through the resources referenced above.<sup>16,18</sup> Despite the inherent difficulty in making  
286 accurate workforce projections, they should not be ignored. Workforce projections continue to  
287 have the potential to significantly influence public policy and medical student specialty selection,  
288 which can in turn affect workforce dynamics. Additional resources and efforts should target

289 research that allows for increased accuracy of projections, as well as more effective workforce  
290 monitoring and planning.

291  
292 Several potential next steps exist to further explore and address the possible saturation of the EM  
293 workforce. National EM organizations must devote attention to this issue, examine workforce  
294 dynamics and consider regulating the expansion of EM residency positions. The American  
295 Academy of Emergency Medicine (AAEM) recently released a position statement expressing  
296 concern that the rapid growth of the EM workforce may result in saturation of the job market.<sup>56</sup>  
297 National organizations should also convene an EM workforce summit involving representatives  
298 from the ACGME and the RRC-EM to discuss current issues and develop recommendations.  
299 Such decision-making will require broad-based involvement from multiple specialty  
300 organizations representing the spectrum of stakeholders including leaders of departments and  
301 training programs, trainees and students, and regulatory organizations. A consensus-style  
302 conference hosted by one or more of the national societies could represent an opportunity for key  
303 stakeholders to develop a research and policy plan around EM workforce dynamics.

304  
305 Additionally, no one particular organization currently assumes responsibility for monitoring EM  
306 workforce dynamics, and legal considerations may complicate strict formal regulation of such. A  
307 consensus-style conference could provide an opportunity to determine if and how a particular  
308 organization should regulate the number of existing EM residency programs. A natural candidate  
309 to consider for this role would be the ACGME, given its significant impact on the supply of EPs  
310 through the approval new programs. Up to this point, its mission has centered around  
311 determining whether a program meets quality standards for accreditation, and not on whether the  
312 need for new programs exists. However, an oversupply of trainee positions could compromise  
313 the quality of training through competition for required experiences, and therefore the workforce  
314 dynamics of a specialty may need to be considered prior to the ACGME's approval of new  
315 programs as part of the mission to ensure high-quality training experiences.

316  
317 EM granting agencies such as the Emergency Medicine Foundation (EMF) and Society for  
318 Academic Emergency Medicine Foundation (SAEMF) should also consider developing specific  
319 grants to study the EM workforce. Beyond EM-specific organizations, collaboration with the

320 AAMC's Workforce Studies Center to examine the EM workforce in detail would also represent  
321 a critical step, as the AAMC has continued to project shortages in a variety of specialties.<sup>57</sup>

322

### 323 **CONCLUSION**

324 The numbers and trends in the EM workforce demonstrate the continued robust growth of the  
325 specialty. Organizations and leaders in the field have applauded and encouraged this growth, but  
326 the data suggest that it is time to call for coordination and increased awareness to proactively  
327 maintain the vibrancy and health of EM workforce dynamics. The issue of workforce projections  
328 should be brought to the forefront of the agenda of national EM organizations. Central workforce  
329 planning may require regulating the number of residencies and expansion of programs to match  
330 future demand rather than risk exceeding it. Additionally, attention to enhancing rural EM  
331 opportunities and experiences for trainees may help redistribute EPs to areas of existing shortage.  
332 Future studies are needed to better understand the factors that shape the EM workforce, and to  
333 develop models that accurately and reliably predict the future workforce.

334

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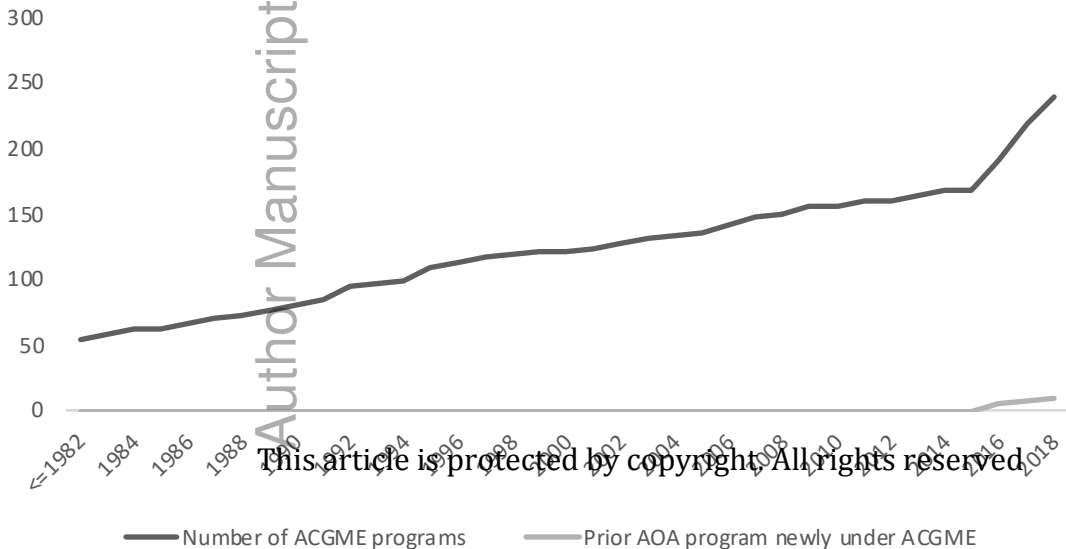
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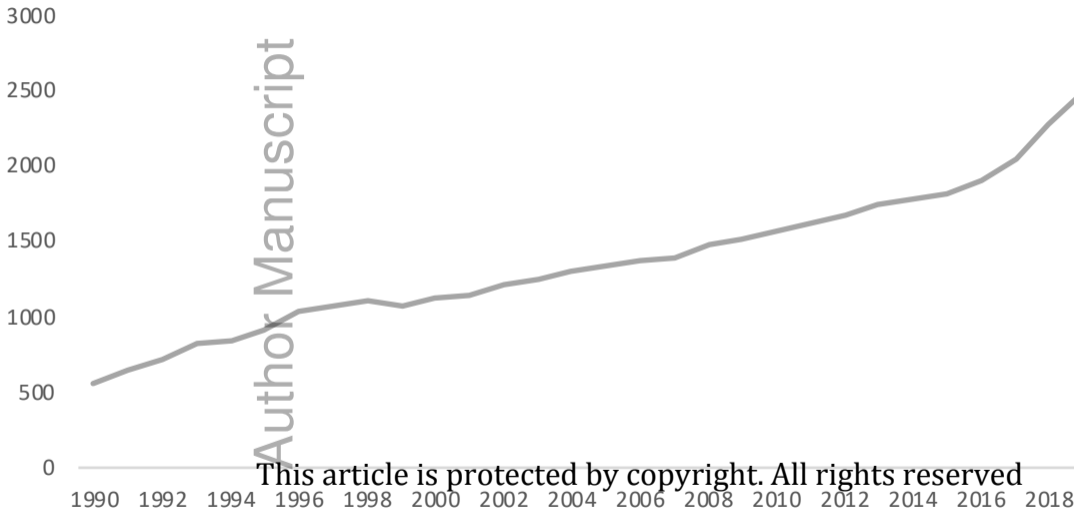
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# Cumulative Numbers of ACGME Approved Emergency Medicine Residency Programs by Year



# Total EM NRMP positions



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— Total EM NRMP positions