

U.S. House Committee on Ways and Means

Subcommittee on Health Care

**Health Subcommittee Hearing on Advancing the Next Generation of
America's Health Care Workforce**

February 24, 2025

Written Testimony

Emily Hawes, PharmD, BCPS, CPP

Professor, University of North Carolina (UNC) School of Medicine

Director, Sheps Graduate Medical Education Technical Assistance Center

UNC Cecil G. Sheps Center for Health Services Research

Chapel Hill, North Carolina

Chairman Buchanan, Ranking Member Doggett, and Members of the Health Subcommittee:

Thank you for the invitation. My name is Emily Hawes. I practice as a rural clinical pharmacist in a small family medicine clinic in Boone, North Carolina and serve as a board member on a local federally qualified health center. I serve as Director of the Rural Residency Planning and Development and Teaching Health Center Graduate Medical Education Technical Assistance Centers, supporting workforce expansion in rural and underserved settings in almost every state. I am a professor at the University of North Carolina School of Medicine, and my rural graduate medical education (GME) policy research is conducted through the UNC Cecil G. Sheps Center for Health Services Research.

Living, practicing, and training clinicians in rural western North Carolina gives me firsthand experience with both the access challenges facing rural communities and the tremendous opportunity for innovation in health policy.

Today, I will focus on three points:

1. Training physicians in rural areas is an evidence-based strategy to address workforce shortages and improve access to care.
2. Federal and state rural GME policies are highly effective at increasing rural training.
3. Congress can take targeted steps to develop, expand, and sustain rural training.

Rural Training Is an Effective Workforce Strategy

Rural-urban health differences are well documented, and the rural-urban mortality gap continues to widen.¹ Health workforce shortages are a major contributor.^{2,3} When communities lose physicians, they lose access to essential care and even hospital viability. Access to quality care should not depend on a patient's zip code.

Training physicians in rural settings is one of the strongest predictors of rural practice. Physicians who train in rural areas are at least twice—and in some studies up to five times—more likely to practice in rural communities.⁴⁻⁷

Through our work supporting more than 200 rural and underserved facilities, we have seen firsthand that bringing residency training to a community strengthens the entire local healthcare environment. Not only does it recruit doctors to practice locally, but the infrastructure of the training programs has spillover effects, like helping reopen labor and delivery units, expanding access to behavioral health care services such as opioid use disorder treatment, increasing treatment for chronic conditions like diabetes, and enhancing the availability of subspecialty services. Once an academic base is established, rural communities often expand training in additional specialties and training for other health professions such as nurses.

Programs like the Osteopathic Medical Education Consortium of Oklahoma are training family medicine residents in rural tribal facilities in Tahlequah, Oklahoma. Their program director shared that within 6 months of starting the residency, wait times for assignments to a PCP reduced from 9 months to 3 months. Of the 25 graduates, 12 have stayed and remain employed with the Cherokee Nation Health Services. One graduate is providing family medicine/obstetrical services on their campus, and another is providing wound care services that were not previously available to patients outside the care of a surgeon. Rural graduate medical education improves access to care.

Federal and State Policies Are Catalyzing Rural Growth

Compared to urban hospitals, many rural facilities face unique challenges—thin financial margins, limited subspecialty services, and less educational infrastructure. Yet with targeted support, for both start-up funding and ongoing long-term financing, they can offer highly effective training.

There are two distinct but equally essential factors in increasing rural residency training. First, rural communities need adequate resources and expertise to effectively launch residency programs—a need that Health Resources and Services Administration (HRSA) has been addressing through the Rural Residency Planning and Development (RRPD) Program. Second, and the focus of my remarks today, is the critical role Medicare plays in ensuring the long-term sustainability of these programs. While the majority of my testimony will focus on policies under this committee's jurisdiction, I will also highlight the importance of supporting the challenging and costly process of developing new residency programs.

The HRSA-administered Rural Residency Planning and Development program, which provides start-up funding and technical assistance, has created 64 new rural residency programs, representing more than 794 accredited positions that are largely supported through Medicare GME financing.^{8,9} One in four rural residencies nationwide were developed through this effort.^{8,10} RRPD exists because Congress created this program in 2018 and continues to support it. Several states are creating similar rural residency start-up initiatives modeled on the success of this federal program, and other states are optimizing their strategies based on the research and lessons learned through RRPD.¹¹⁻¹⁷

Medicare GME is the largest funder of physician training, and Congress making more Medicare GME financing available has been key to expanding rural residency training. Congressional reforms in the Consolidated Appropriations Act of 2021, such as resetting artificially low Medicare reimbursement to unlock rural training opportunities and streamlining accreditation processes have allowed hospitals to establish rural training more efficiently.¹⁸ This has led to the creation of new rural residencies such as a psychiatry program in rural Harrison County through West Virginia University. Additional payment slots through Section 126 have directly helped 9 rural hospitals and supported several urban partners of rural training programs.¹⁹

Furthermore, there has been a ten-fold increase in Critical Access Hospitals participating in GME over the past decade.²⁰ Not only have RRPD grants and Medicare financing flexibility contributed to growth, but changes in Medicare regulations enabling urban hospitals to receive reimbursement for Critical Access Hospitals treated as non-provider sites. With only 7 percent (96 of 1364) of Critical Access Hospitals training residents, there is potential to expand training further in these sites.²⁰ In fact, there are 41 Critical Access Hospitals currently developing rural residencies through the RRPD program.⁸ There is substantial interest and enthusiasm in doing this—just this past week, we had over 100 attendees on our RRPD webinar focused on how to grow training in their Critical Access Hospitals.

Taken together, rural residency programs have increased roughly four fold since 2008, thanks to these Medicare reforms and the Rural Residency Planning and Development Program.^{8,10} Furthermore, there were 459 rural rotation experiences offered by residency programs in academic year 2024-2025.⁸ These data show that training in rural and underserved communities is not only possible but that there is untapped capacity to train even more physicians there.

Policy matters. When Congress removes barriers and provides targeted support, rural training grows.

Targeted Policy Reforms Can Expand and Sustain Rural GME

Despite this progress, most GME remains concentrated in urban areas²¹ and additional reforms are needed to ensure rural training can scale and endure to meet population health needs. Based on our on-the-ground technical assistance and research, I offer the following considerations for Congress to enhance rural residency training:

1. Target Medicare Rural Track eligibility to rural census tracts, rather than just rural counties, to reach more rural hospitals for residency creation.

Current Medicare Rural Track Program (RTP) eligibility is determined at the county level (greater than 50% training in non-metropolitan counties), which can often be too large a geography to accurately characterize variation within the county and also misses rural census tracts within metropolitan counties.⁸ Chatham County, North Carolina, is a great example – the eastern part has affluent suburbs of the Research Triangle Park, but the western half is agricultural dominant and has a large meat packing plant. UNC Health Chatham is a Critical Access Hospital on the western side of the county that serves a predominantly rural community and is a training site for family medicine physicians in partnership with a federally qualified health center. If Medicare RTP eligibility were aligned with the Federal Office of Rural Health Policy definition, which captures rural census tracts within metropolitan counties, this UNC program which is currently funded by UNC Health and the affiliated rural hospital, could have accessed stable Medicare funding to support its ongoing production of graduates practicing in rural areas. Nationally, there are 459 additional rural hospitals (mean bed size of 61) that would be eligible for Medicare Rural Track Program financing if the rural definition included rural census tracts within metropolitan counties.⁸

2. Lower the 50 percent rural training threshold to 30 percent for procedurally intensive specialties like general surgery and OBGYN, as rural hospitals struggle to achieve 50 percent of needed training.

Development of new rural residencies in OB/GYN and general surgery has been limited, despite federal and state funding opportunities. RRPD has led to the creation of one rural track program in general surgery in Logan, West Virginia and one OB/GYN rural track program established in Wisconsin. Given that the procedural volume at rural hospitals is often cited as a barrier to new training opportunities, our team conducted a six-state evaluation using an all-payer dataset to determine the capacity of rural hospitals to participate in OB/GYN and general surgery training. In our general surgery analysis, we found more than 120 additional rural hospitals that could meet 20% of accreditation minimums compared to 50%. States that have lowered the rural training threshold for general surgery have seen an increase in rural general surgery training. For example, Wisconsin has three rural surgery training programs and two OB/GYN rural tracks, ranging from 2 months to 18 months in rural sites, that are producing graduates with greater than 70% rural and in-state retention. Recent published research demonstrates that programs with rural missions, in rural locations, or offering rural rotations produced surgeons who were more likely to work in rural areas.²² Furthermore, preliminary research on a national data set from one of our team members suggests that even modest levels of rural training exposure (average of 25% rural training time) can increase rural practice.

Applying the aforementioned lessons, the North Carolina General Assembly established the UNC System Rural Residency and Medical Education Training fund to offer start-up and sustainability funds for rural residencies training greater than 30% time in rural census tracts.¹⁶ Lowering the rural training threshold is especially important for our state as there are no rural general surgery

residency programs and 25 rural counties have no practicing general surgeon. There are two NC surgery programs who have expressed interest in creating rural tracks.

3. Extend the Medicare cap-building window from five years to ten years for rural hospitals to have more time to achieve their full training potential.

Compared to urban hospitals, rural hospitals often need more time to build an educational infrastructure, especially in places where training has never existed (i.e. GME-naïve). There are more than 1,700 GME-naïve hospitals that are located in rural counties. Recruiting faculty and preparing the facility and staff to train residents can take longer. Based on current Medicare regulations, GME financing is locked at the five-year cap setting year. Lengthening the time frame for rural hospitals to build their training infrastructure and establish their full complement can be an effective method to grow rural training capacity.¹⁸ For example, the Sierra Nevada Family Medicine Residency Program, accredited in 2021, currently trains six residents in rural Grass Valley, California through a partnership that includes a rural hospital, a tribal-affiliated federally qualified health center, and an urban hospital. As the program approaches the end of its initial five-year Medicare cap-setting period, program leaders have recognized that their rural program has the capacity to support double their size. However, because Medicare caps are determined based on resident counts during the five-year period, the program is now rushing to expand positions in this limited timeframe to avoid permanently constraining future training capacity. This situation illustrates how the current cap-setting structure can create pressure for rapid growth rather than thoughtful expansion, particularly for rural programs that often scale more gradually as clinical partnerships and faculty infrastructure mature.

4. Allow rural facilities to reset low per-resident amounts or FTE caps to unlock training capacity by extending the flexibility of Section 131.

Section 131 of the Consolidated Appropriations Act has played a role in allowing hospitals that inadvertently triggered caps when hosting residents on rotation to reset their FTE caps and per-resident amounts. An initial analysis shows that in the first few years of the program, 23 out of 219 eligible hospitals started new GME programs.²³ Two of the hospitals that have undertaken an FTE reset are located in rural areas and were able to reset their FTE caps, which has enabled new GME development. Our results show that for most hospitals, the five-year time frame proved to be challenging for a reset opportunity, as 89.5% of eligible hospitals could not start new programs or host the requisite number of resident rotators to qualify for a reset in the first three years of implementation. If Congress were to extend Section 131, these 196 hospitals, 42 of which are in rural locations, may become eligible to remedy their Medicare financing and participate in GME.²³ Flexibilities that open up the opportunity for geographically rural hospitals to reset their FTE caps or per-resident amounts help support rural GME viability.

5. Ensure rural hospitals, such as Sole Community Hospitals and Medicare Dependent Hospitals, receive full Medicare GME reimbursement.

GME financing can vary by hospital type. Sole Community Hospitals (SCHs) and Medicare Dependent Hospitals (MDHs) play a vital role in delivering healthcare to rural populations and serve as strong potential hosts for residency training programs. Together, SCHs and MDHs account for one-fourth of rural hospitals.²⁴ Approximately 85% of the SCHs or MDHs located in rural regions do not currently train residents, which represents a substantial number of potential hospitals rural health facilities that could consider beginning physician training in their communities.²⁴ Our research revealed 145 geographically rural, GME-naïve hospitals with potential to host new residency programs, the majority of which are SCHs or MDHs.²⁴ These facilities frequently possess

the necessary clinical volume, revenue, and services to support training, yet do not receive full indirect medical expenses payments. Compared to IPPS hospitals (typically urban hospitals), the median deficit per resident FTE for MDHs is approximately \$65,000, whereas it is approximately \$73,000 for SCHs.¹¹ This funding difference can disincentive GME growth and put programs at risk for financial instability. Furthermore, 68 of the RRPD grant recipients that are developing residencies have SCH and/or MDH training sites.⁸ Improved GME funding for SCHs and MDHs is essential to ensure their long-term residency program sustainability along with the ability to attract and retain a skilled workforce. Through our work with grantees, we have learned of other hospitals that are projected to receive lower reimbursement for GME compared to IPPS hospitals, such as psychiatric hospitals. HRSA has asked our Technical Assistance Center to conduct a similar analysis for psychiatric hospitals this year.

Rural Residency Planning and Development Hospital Training Sites

Inpatient Prospective Payment (IPPS) Hospital	76
Rural Referral Center (RRC)	60
Critical Access Hospital (CAH)	41
Sole Community Hospital (SCH)	32
Sole Community Hospital/Rural Referral Center (SCH/RRC)	27
Children’s Hospital	26
Veterans Affairs (VA) Medical Center	19
Psychiatric Hospital	14
Medicare-Dependent, Small Rural Hospital (MDH)	9
Indian Health Service Hospital	6
Disproportionate Share Hospital	1
Total	311

6. Direct additional payment slots to geographically rural training programs.

Allowing rural hospitals an opportunity to secure additional Medicare payment slots can help fund and sustain older rural programs that did not reach their full training capacity when their cap was set in the fifth year after launching their program. Section 126 of the Consolidated Appropriations Act of 2021 allowed for allocation of 1,000 new residency slots, over five years (200 slots each per year starting in fiscal year 2023 for Direct Graduate Medical Education (DGME) and Indirect Graduate Medical Education (IME)).¹⁸ Taking four rounds together, Section 126 distributions have not significantly expanded GME in geographical rural areas. Less than 5% of the first four rounds of Section 126 payment slot distribution have reached geographically rural hospitals. And some of those that received payment slots only received partial allocations.^{19,25-28} Relying on Health Professional Shortage Area (HPSA) scores as a primary factor in slot distribution seemed to disadvantage some rural hospitals. Those with low or no HPSA scores who were otherwise qualified chose not to apply for additional slots.

7. Enable other rural health facilities, such as tribal sites, to be treated as non-provider sites.

As mentioned above, expanding the flexibility for Critical Access Hospitals to serve as non-provider training sites has helped support a ten-fold rise in their GME engagement. Enabling other sites, such as Indian Health Service hospitals²⁹ and other rural hospitals, to serve as non-provider sites could increase opportunities for rural GME. Because rural health facilities sometimes do not receive Medicare GME funding through their partners, it is important to have straightforward pathways for them to access support directly. Partnerships can still help expand training

opportunities, but they are not a substitute for ensuring rural facilities receive their share of Medicare GME resources.

8. Build on successful models like Rural Residency Planning and Development, which are increasing rural training capacity.

The HRSA-administered Rural Residency Planning and Development (RRPD) have been invaluable to starting new rural residency programs and understanding how Medicare payment can be reformed to prevent program closure and ensure long-term rural residency impact. The RRPD program has created 66 new rural residency programs, representing greater than 794 accredited resident positions, with 40 more new programs in development.^{8,9} The 103 grant recipients developing a total of 106 new residency programs in family medicine (82), psychiatry (11), internal medicine (10), OB/GYN (1), general surgery (1), and preventive medicine (1) ranging from 2 to 12 residents per class.^{8,9} From Critical Access Hospitals to Rural Health Clinics, it takes a village of partners to start a rural residency and collectively there are 549 training sites across the RRPD grant recipients.⁸ The RRPD program, which is behind 1 in 4 current rural residency programs nationally, provides start-up funding and technical assistance to create new accredited rural residencies that are designed to be sustained through stable sources largely Medicare GME.^{8,10}

Prioritizing technical assistance in conjunction with start-up funding is a critical component of a GME growth strategy, ensuring programs can launch, expand, and remain sustainable long-term.^{30,31} There are nuances related to accreditation, program planning, and financing that require deep expertise to ensure long-term viability, including but not limited to compliance with accreditation requirements and eligibility for Medicare reimbursement.³⁰ Designing a program that will be sustained through stable sources like Medicare reimbursement is complicated and can be impacted by several factors, such as hospital type, location, specialty, etc. Our HRSA-funded RRPD Technical Assistance Center assists rural health organizations in designing, launching, and sustaining accredited residency programs responsive to local community assets and needs. It integrates program readiness assessments, tailored advising and consultations, peer learning, resource sharing, and dissemination of best practices to accelerate progress along defined roadmaps and grow a durable physician workforce. Not only do we provide individualized support to RRPD grant recipients, but we offer free tools and resources to anyone interested in rural GME development. Our RuralGME hospital analyzer and accompanied glossary, which can be accessed at www.ruralgme.org, was produced as part of our federally-funded work and provides a starting point for thinking about sustainability options for almost every acute-care hospital across the nation.

Lessons learned from the HRSA Teaching Health Center Graduate Medical Education (THCGME) have been helpful in understanding the impact of community-based training on rural and underserved workforce.³² Eighty five percent of THCGME graduates practice in medically underserved areas after graduation, compared with 24.1% of all US residency medical graduates.^{33,34} THCGME family medicine graduates have a broader scope of practice compared to non-THCGME graduates, with a greater likelihood of providing treatment for opioid use disorder and offering behavioral health care.³⁵ Over one-quarter of counties (47 of 180 counties) with THCGME sites are rural.³⁶ This program has been highly successful and has had more interested applicants than available funds.³⁶

In closing, I'd like to share the GME story from my rural community. I live in a beautiful town nestled in the Appalachian Mountains with a population of about 20,000. It is a non-metropolitan county (i.e. eligible for

Medicare rural track program funding). My community was home to one of the first RRPD grant recipients, Mountain Area Health Education Center (MAHEC) Boone Family Medicine. Watauga Medical Center, the primary training site, is a Sole Community Hospital that had inadvertently triggered a low per resident amount likely due to hosting resident rotators as a strategy to attract physicians to the rural community. This rural hospital received a \$750,000 grant and technical assistance through the HRSA RRPD program which helped facilitate the development of the Mountain Area Health Education Center Rural Boone Family Medicine residency. Resetting the per-resident amount unlocked necessary funding for this rural hospital to train a complement of 18 resident physicians and overcome a per-resident amount of \$0 which could have made launching a rural residency nearly impossible. Their training is specifically designed to provide the breadth and depth required for rural primary care, equipping them to care for patients across the lifespan—from newborns to parents and families to geriatric patients. Bringing the residency to our community helped expand access to primary care, behavioral healthcare, prenatal care, and treatment for chronic diseases. Almost all the residency faculty completed fellowships to further hone skills and training to serve rural populations in lifestyle medicine, rural health, and sports medicine. The residents rotate throughout our community across 15 or more different sites such as the Critical Access Hospital, private practice clinics, and a local community health center. The curriculum has unique components focused on wilderness medicine and even disaster relief, which proved invaluable during Hurricane Helene. All the MAHEC residencies offer a path for residents to get intensive training in lifestyle medicine, which emphasizes nutrition and exercise as treatments for chronic diseases like high blood pressure and diabetes. The program has produced thirteen graduates with ten still practicing in rural locations (9 practicing in rural locations within the state) with most continuing to teach residents and students in their rural settings. Interestingly, three of the graduates finished training and created a brand-new primary care clinic in an adjacent rural county with even more challenges with primary care access (RUCA of 10, HPSA score of 18). One of the graduates joined my local family medicine clinic and we went from not accepting new patients to accepting new patients.

To support the creation, expansion, and sustainability of rural residencies the North Carolina General Assembly recently appropriated recurring and non-recurring dollars for the UNC System Rural Residency and Medical Education Training Fund. A grant program has been developed with flexibility such as lower rural training time requirements and a broader rural geographic definition, aligned with policy considerations shared with you today. Given Watauga Medical Center's status as a Sole Community Hospital, they do not receive full Medicare reimbursement for training. Thus, they are applying for this state funding to fill the gap of deficits in their Medicare GME financing to support long-term viability. They have reached their 5-year cap for family medicine, thus if the program wants to expand to train more than 18 residents, they will need to apply for expansion payment slots. Finally, North Carolina has no rural general surgery residency programs but has 25 rural counties with no general surgeon. Through the RRPD grant process, Watauga Medical Center established an educational infrastructure and has an eager group of rural surgeons (some of whom are nearing retirement) that want to start our state's first rural surgery program. They have the procedure volume and case mix to meet at least 30% of the accreditation procedure minimums and have applied to receive a state start-up grant to create an accredited surgery residency with 30% rural training time. Furthermore, they plan to start a rural psychiatry residency in our community, where access to psychiatry currently takes months.

With start-up funding, technical assistance, and long-term Medicare financing, rural GME is possible. Building rural training capacity takes community engagement, clinical partnerships, sustainable financing, physician champions, C-suite buy in, rural-based curriculum, and faculty development. Its direct impact on access to care is playing an important role in improving the health and wellbeing of rural citizens.

Training physicians in rural America is an evidence-based solution to enhancing physician supply, increasing access to care, and improving health outcomes in underserved communities. With continued bipartisan support and thoughtful policy refinement, we can ensure that rural communities train, recruit, and retain the physicians they need.

Thank you, and I look forward to your questions.

Citations:

1. Weeks WB, Chang JE, Pagán JA, et al. Rural-urban disparities in health outcomes, clinical care, health behaviors, and social determinants of health and an action-oriented, dynamic tool for visualizing them. *PLOS Glob Public Health*. 2023;3(10):e0002420. doi:10.1371/journal.pgph.0002420
2. Gong G, Phillips SG, Hudson C, Curti D, Philips BU. Higher US Rural Mortality Rates Linked To Socioeconomic Status, Physician Shortages, And Lack Of Health Insurance. *Health Aff (Millwood)*. 2019;38(12):2003-2010. doi:10.1377/hlthaff.2019.00722
3. Basu S, Berkowitz SA, Phillips RL, Bitton A, Landon BE, Phillips RS. Association of Primary Care Physician Supply With Population Mortality in the United States, 2005-2015. *JAMA Intern Med*. 2019;179(4):506-514. doi:10.1001/jamainternmed.2018.7624
4. Russell DJ, Wilkinson E, Petterson S, Chen C, Bazemore A. Family Medicine Residencies: How Rural Training Exposure in GME Is Associated With Subsequent Rural Practice. *J Grad Med Educ*. Published online August 1, 2022. doi:10.4300/JGME-D-21-01143.1
5. Patterson DG, Shipman SA, Pollack SW, et al. Growing a rural family physician workforce: The contributions of rural background and rural place of residency training. *Health Serv Res*. 2024;59(1):e14168. doi:10.1111/1475-6773.14168
6. Goodfellow A, Ulloa JG, Dowling PT, et al. Predictors of Primary Care Physician Practice Location in Underserved Urban and Rural Areas in the United States: A Systematic Literature Review. *Acad Med J Assoc Am Med Coll*. 2016;91(9):1313-1321. doi:10.1097/ACM.0000000000001203
7. Hawes E, Rains J, Chen C, Fraher E. Training the primary care workforce to deliver team-based care in underserved areas: the Teaching Health Center Program. *Milbank Meml Fund*. Published online 2023. https://www.milbank.org/wp-content/uploads/2023/05/THC-Milbank_4.pdf
8. Rural Residency Planning and Development-Technical Assistance Center. Rural Residency Planning and Development (RRPD) Program Data on File. Published online February 2026. www.ruralgme.org
9. U.S. Health Resources and Services Administration. Rural Residency Planning and Development (RRPD) Program. September 2025. Accessed February 19, 2026. <https://www.hrsa.gov/rural-health/grants/rural-health-research-policy/rrpd>
10. Hawes EM, Lombardi B, Adhikari M, et al. Physician Training In Rural And Health Center Settings More Than Doubled, 2008–24. *Health Aff (Millwood)*. 2025;44(5):572-579. doi:10.1377/hlthaff.2024.01297
11. Adhikari M, Hawes EM, Rains J, Francazio CL, Holmes GM. Financial Barriers to Rural Graduate Medical Education: Medicare Funding Methods for Sole Community and Medicare-Dependent Hospitals. *Acad Med*. 2025;100(4):490-496. doi:10.1097/ACM.0000000000005948
12. Abid M, Rodefled L, Adhikari M, et al. Cultivating Rural Surgeons: An Analysis of the Current Rural Surgery Graduate Medical Education Landscape and a Roadmap to Program Creation. *J Surg Educ*. 2025;82(4):103446. doi:10.1016/j.jsurg.2025.103446
13. Hawes EM, Rodefled L, Pathak S, Lombardi B, Chan C, Elswick DE. Rural and Underserved Graduate Medical Education: A Strategy for Aligning Psychiatry Training with Population Needs. *Acad Psychiatry*. 2024;48(5):501-506. doi:10.1007/s40596-024-01991-x
14. North Carolina Graduate Medical Education-Technical Assistance Center. NCGME.org. Accessed February 19, 2026. <https://ncgme.org/>
15. U.S. Centers for Medicare & Medicaid Services. Rural Health Transformation (RHT) Program. December 29, 2025. Accessed February 19, 2026. <https://www.cms.gov/priorities/rural-health-transformation-rht-program/overview>
16. The University of North Carolina System. Rural Health Care Workforce. Accessed February 19, 2026. <https://www.northcarolina.edu/rural-health/>
17. Missouri Department of Health & Senior Services. Building Missouri's Health Care Future. Accessed February 19, 2026. <https://health.mo.gov/living/families/primarycare/gme/>
18. Hawes EM, Holmes M, Fraher EP, et al. New Opportunities for Expanding Rural Graduate Medical Education to Improve Rural Health Outcomes: Implications of the Consolidated Appropriations Act of 2021. *Acad Med*. 2022;97(9):1259-1263. doi:10.1097/ACM.0000000000004797
19. U.S. Government Accountability Office. Graduate Medical Education: Information on Initial Distributions of New Medicare-Funded Physician Residency Positions. December 22, 2025. Accessed February 20, 2026. <https://www.gao.gov/products/gao-26-107686>

20. Rodefeld L, Adhikari M, Horger C (Kasia), Boll J, Hawes EM. The Evolving Role of Critical Access Hospitals in Rural Physician Training. *JAMA Health Forum*. 2025;6(10):e254742. doi:10.1001/jamahealthforum.2025.4742
21. U.S. Government Accountability Office. Graduate Medical Education: Programs and Residents Increased during Transition to Single Accreditor; Distribution Largely Unchanged. April 13, 2021. Accessed February 20, 2026. <https://www.gao.gov/products/gao-21-329>
22. Clark NM, McClure P, Erickson A, et al. Impact of Rural Exposure During General Surgery Residency on Practice in a Rural Community. *Ann Surg*. 2025;282(2):186. doi:10.1097/SLA.0000000000006696
23. Adhikari M, Baker M, Cunningham BM, Holmes GM, Rodefeld L, Hawes EM. Section 131: A Lifeline on Its Last Breath. AAMC. Accessed February 20, 2026. <https://www.aamc.org/about-us/mission-areas/clinical-care/section-131>
24. Adhikari M, Hawes EM, Sanner L, Holmes GM. Characteristics of Hospitals by Graduate Medical Education Expense Category: Implications for Rural Residency Program Expansion. *Acad Med*. 2024;99(5):567-574. doi:10.1097/ACM.0000000000005589
25. Rains J, Holmes GM, Pathak S, Hawes EM. The Distribution of Additional Residency Slots to Rural and Underserved Areas. *JAMA*. 2023;330(10):968-969. doi:10.1001/jama.2023.14452
26. Rodefeld L, Adhikari M, Hawes EM. Overview of Residency Programs Selected for CAA Sec. 126 Round Two Graduate Medical Education Slots. Published online December 2023. <https://ruralgme.org/research>
27. Adhikari M, Hawes EM, Holmes GM, Rodefeld L. Overview of Residency Programs Selected for CAA Sec. 126 Round Three Graduate Medical Education Slots. Published online January 2025. <https://ruralgme.org/research>
28. Adhikari M, Davis R, Hawes EM, Holmes GM, Rodefeld L. Overview of Residency Programs Selected for CAA Sec. 126 Round Four Graduate Medical Education Slots. Published online January 2026. <https://ruralgme.org/research>
29. Tobey M, Adhikari M, Holmes GM, Kannan V, Warne D, Hawes EM. Comparing Indian Health Service Sites to Rural Physician Teaching Hospitals. *JAMA Intern Med*. 2025;185(8):1040-1042. doi:10.1001/jamainternmed.2025.1827
30. Hawes EM, Weidner A, Page C, et al. A Roadmap to Rural Residency Program Development. *J Grad Med Educ*. 2020;12(4):384-387. doi:10.4300/JGME-D-19-00932.1
31. Weidner A, Brown M, Evans DV, et al. Faculty Development in New and Emerging Rural Residency Programs. *J Grad Med Educ*. 2025;17(3):362-366. doi:10.4300/JGME-D-24-00923.1
32. U.S. Health Resources and Services Administration. Teaching Health Center Graduate Medical Education (THCGME): Expanding the Primary Care Workforce. September 2025. Accessed February 20, 2026. <https://bhwh.hrsa.gov/funding/apply-grant/teaching-health-center-graduate-medical-education>
33. National Center for Health Workforce Analysis. *Teaching Health Center Graduate Medical Education Program*. Health Resources and Services Administration. <https://bhwh.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/thcgm-eval-nchwa-2023-2024.pdf>
34. Association of American Medical Colleges. Table C2. Number of Individuals Who Completed Residency and Are Practicing in Federally Designated Medically Underserved Areas, by Last Completed GME Specialty. AAMC. 2022. Accessed February 20, 2026. <https://www.aamc.org/data-reports/students-residents/data/report-residents/2022/table-c2-number-individuals-who-completed-residency-and-are-practicing>
35. Davis CS, Roy T, Peterson LE, Bazemore AW. Evaluating the Teaching Health Center Graduate Medical Education Model at 10 Years: Practice-Based Outcomes and Opportunities. Published online October 1, 2022. doi:10.4300/JGME-D-22-00187.1
36. Hawes EM, Adhikari M, Rains J, et al. Evaluating Teaching Health Center Planning and Development: Unlocking and Sustaining the Full Potential of the Teaching Health Center Program. *J Grad Med Educ*. 2025;17(3):296-303. doi:10.4300/JGME-D-24-00593.1