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Emergency Department Provider Staffing among Critical Access Hospitals in Minnesota

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Abstract

Background

Access to healthcare remains a challenge in many rural regions. Rural critical access hospitals (CAHs) remain essential access points. Providing 24-hour access, CAH emergency departments (EDs) rely on medical staff who can treat a wide range of problems. Family physicians/general practitioners have traditionally staffed rural EDs. However, this staffing model may be changing. This study aims to characterize the current medical staffing profiles of Minnesota's CAH EDs.

Methods

From January to February 2021, the executive leaders of all of Minnesota's 77 CAHs were invited to complete a voluntary online survey about ED staffing patterns at their facility.

Results

37/77 of MN's CAHs responded to the survey (48% response rate). Just over half (51.4%) of the respondents reported ED physician staffing practices that included multiple physician specialties (family medicine, internal medicine, emergency medicine) while 32.4% reported staffing exclusively with family medicine physicians. A majority, 27/37 (73%), reported including non-physicians on their ED medical staff, especially at CAHs that were part of a larger healthcare system.

Discussion

CAHs often operate with limited workforce and resource options. This study demonstrates that MN's CAHs exhibit a variety of ED staffing patterns with staffing decisions driven by multiple factors. Family medicine physicians contribute to CAH ED coverage. Future studies may expand our understanding of how ED staffing models impact community health, disease outcomes, and CAH financial viability.

Conclusion

ED staffing patterns across Minnesota's CAHs vary significantly with variable use of physicians and non-physician providers. Family physicians remain an important specialty for CAH ED coverage

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INTRODUCTION

Family medicine physicians (FPs) have historically contributed to providing necessary emergency medical care in emergency departments (EDs), especially in rural areas of the United States[1–3] but this may be changing. The AAFP position paper on FPs delivering emergency care states that FPs play an important role in providing emergency medical care, and that the training FPs receive in residency prepares them appropriately for providing emergency care.[4] Despite this, there is controversy regarding FPs practicing emergency medicine, and FPs have been viewed as competitors. Some hospitals have recently implemented requirements for emergency medicine board certification for physicians who staff EDs. The field of emergency medicine is constantly evolving along with the challenges that many rural EDs face, such as an adequate supply of physicians providing appropriate emergency care for rural patients.

In 2005, a study was published by the University of Nebraska Medical Center that showed 65% of urban EDs in Nebraska, North Dakota, and South Dakota were staffed with emergency medicine physicians (EPs) compared to 30% of EDs in rural areas of these states (with EPs defined in the study as either emergency medicine residency trained or holding American Board of Emergency Medicine certification).[5] A study was also completed in Iowa that aimed to characterize the workforce in EDs across the state as well as determine the community population required to support hiring EPs. They found only 11.8% of Iowa's EDs were staffed exclusively with EPs in 2012, with the rest of the EDs staffing with either only FPs or a combination of FPs and EPs. They also found there was a statistically significant increase in physician assistants (PAs) and nurse practitioners (NPs) providing solo coverage of Iowa's EDs from 2008 to 2012. The researchers determined a mean population of approximately 85,000 is required to support an ED staffed exclusively by EPs, whereas a population of 25,000 was adequate when staffed with FPs and EPs.[6]

Although distinguished in other states through these studies, currently little is known about provider staffing practices at Minnesota's critical access hospital (CAH) EDs. This topic arose during a February 2020 local Lake Superior chapter meeting of the Minnesota Academy of Family Physicians held on the Duluth regional campus of the University of Minnesota Medical School (DRC-UMMS). Rumors of new health system policies that could restrict rural ED coverage to only EM residency trained physicians had sparked the discussion. Coincidentally, students from the same campus were asking similar questions about rural ED staffing practices based on their own observations in the rural emergency rooms during required rotations. DRC-UMMS students saw a variety of both physicians and non-physicians staffing rural Minnesota's EDs, and they wondered how rural hospitals made ED staffing decisions. The shared curiosity of medical students and practicing physicians about rural ED staffing prompted this research.

According to the MN Department of Health, "'critical access hospital' is a designation given to eligible rural hospitals by the Centers for Medicare and Medicaid Services (CMS). The CAH designation is designed to reduce the financial vulnerability of rural hospitals and improve access to healthcare by keeping essential services in rural communities."[7] This study aims to determine who is providing care at these CAH EDs and if staffing preferences exist. We specifically examined whether hospitals staff advanced practice providers (APPs) such as PAs and NPs for ED coverage, and which physician specialties are contributing to ED coverage.

METHODS

This study was granted an exemption in November 2020 from formal review for human subjects' protection by the University of Minnesota Institutional Review Board. The list of current CAHs in Minnesota was obtained from the Minnesota Department of Health.[7] A Qualtrics survey (Appendix A) was emailed to administrators from each of Minnesota's current 77 CAHs with questions from a published study serving as a foundation for development. The survey tool included a standardized set of both multiple choice and open-ended questions. Questions focused on emergency room coverage by physicians trained in the specialties of family medicine, emergency medicine and internal medicine, as well as non-physician advanced practice providers such as physician assistants and nurse practitioners. However, an additional "other" category was often

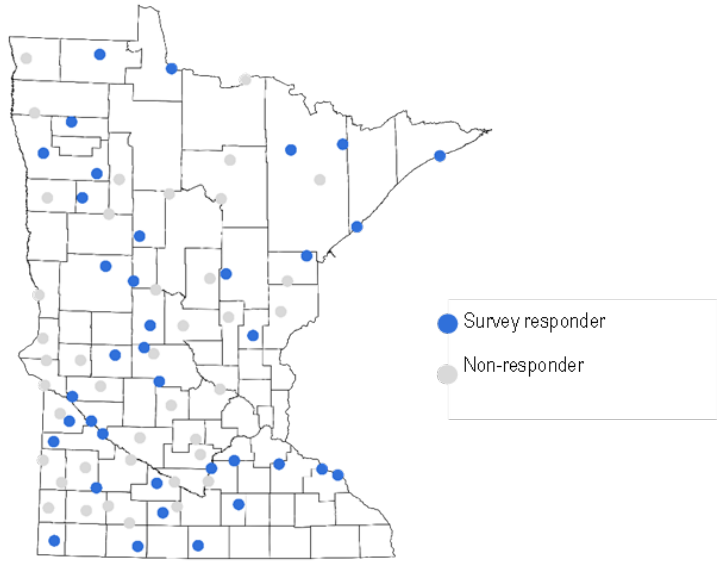
provided to allow for ED coverage by health professionals outside of these categories (e.g., internal medicine/pediatrics, general surgery). A total of 42 surveys from staff at MN CAHs were initiated in Qualtrics between January 7th and February 19th, 2021, following an invitation to participate sent out January 2nd. Of these, 5 were partially complete and 37 were fully complete. The partially complete surveys did not respond to any of the core survey questions, and so they were excluded from the analysis. Efforts to maximize the survey response rate included email reminders to the non-responding hospitals sent at two-week intervals in mid-January and again in late January. In early February, a research team member attempted to reach each non-responder by telephone, leaving messages when necessary. This phone call reminder was repeated again in mid-February. After two email and two phone call reminders were made for each non-responder, no further solicitations were made.

Survey results were summarized overall and by hospital characteristics using SAS v.9.4 (SAS Institute, Inc., Cary, NC). P-values <0.05 were considered statistically significant, and clinical significance was considered in addition to statistical significance in the interpretation of the results. A description of the CAHs responding to the survey was created by summarizing key hospital characteristics, and locations of the hospitals responding were mapped using the zip code provided on the survey. The rest of the survey questions were summarized overall, providing an understanding of the types of providers hired at the hospitals, the proportion of each week's hours covered by each provider type, and the reasons that hospitals have chosen to hire each provider type. Subgroup analyses were conducted using chi-square tests (or Fisher's exact tests where necessary) to test for a difference in provider types at the EDs based on hospital ownership (independent/health system).

RESULTS

Survey responses were received from 37/77 of Minnesota's CAHs, for a response rate of 48% (Figure 1). The 37 survey respondents self-identified in the following categories: Administrator (n=6), CEO or President (n=21), Medical Staff Liaison/Provider Practice Manager (n=1), Operations Administrator (n=2), Operations Manager (n=3), Senior Director (n=3) and Vice President (n=1). The respondents' geographic locations appear to be scattered fairly evenly across Minnesota. Just under half (46%) of the responding CAHs were independent hospitals and not part of a larger healthcare system. 76% of the 37 respondents reported 15 or more active inpatient beds at their hospital with the modal response at 25 beds (n=11). While the number of ED visits was not systematically collected for every participating CAH, responses ranged from 1,900 to 10,800 ED patient visits per year.

Figure 1. Critical Access hospital locations and survey respondents, Minnesota USA



Of the 37 responses, 27 CAH EDs reported staffing PAs or NPs (73%). Nearly half (49%) reported staffing PAs/NPs for solo coverage (Table 1). Independently owned CAHs were more likely to report not staffing PAs/NPs (47% vs 10%, p=.02), while CAHs that are part of a health system were more likely to report staffing PAs/NPs for solo coverage (70% vs 29%, p=.03).

Regarding physician staffing, we found that only one (1) CAH staffed entirely with EPs. None of the responding critical access hospitals staffed solely with internal medicine (IM) physicians. Twelve (32%) reported staffing exclusively FPs, and 19 (51%) reported using a combination of FPs, EPs, and IM physicians (Table 2). Physician type staffing patterns were relatively similar between the independent and health system CAHs.

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Table 1: MN CAH ED staffing with PAs and/or NPs.

Response	Number	Percentage
Yes (for solo coverage)	18	48.7%
Yes (as a second provider)	8	21.6%
Yes (both)	1	2.7%
No (PAs and NPs are not staffed)	10	27.0%

Definitions*: MN=Minnesota; CAH=Critical Access Hospital; ED=Emergency Department; PA=Physician Assistant; NP=Nurse Practitioner*

Table 2: MN CAH ED physician staffing.

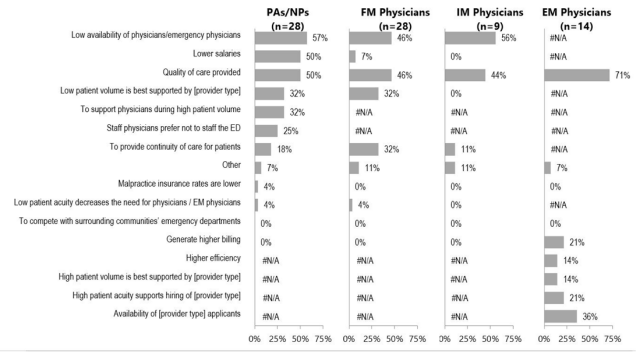
Response	Number	Percentage
Exclusively EPs	1	2.7%
Exclusively IM physicians	0	0.0%
Exclusively FPs	12	32.4%
Combination of EPs/IM/FPs	19	51.4%
Other*	5	13.5%

**Other responses indicated in free text that they did not staff MDs.*

Definitions*: MN=Minnesota; CAH=Critical Access Hospital; ED=Emergency Department; EP=Emergency Physician; IM=Internal Medicine Physician; FP=Family Physician; MD=Medical Doctor*

As summarized in Figure 2, the CAHs that responded to the survey reported hiring PAs/NPs mostly due to the low availability of physicians (57%), lower salaries (50%), and the quality of care provided by PAs/NPs (50%). Hospitals reported hiring emergency medicine physicians mostly for the quality of care provided (71%). Family medicine physicians were hired mostly due to the quality of care provided (46%) and the low availability of emergency medicine physicians (46%). Lastly, though the majority of CAHs reported not hiring internal medicine physicians, those that did reported hiring mostly due to low availability of emergency medicine physicians (5/9 respondents). Interestingly, the following descriptors did not seem to play a major role in ED staffing decisions: competing with surrounding communities' EDs, generating higher billing, and patient acuity.

Figure 2. Survey responses to the question, "Which of the following best explains the reasons for hiring each provider type (select all that apply)?"



Note: #N/A indicates that question was not asked for provider type
Definitions: PA=Physician Assistant; NP=Nurse Practitioner; FM=Family Medicine; IM=Internal Medicine; EM=Emergency Medicine; ED=Emergency Department

About half of the respondents felt that their current ED staffing scenario is ideal (49%). For those CAHs that reported their current scenario is less than ideal, the top three reasons chosen were: staff providers unwilling to staff the ED (44%), limited financial resources to hire desired providers (38%), and inability to recruit desired providers (31%).

DISCUSSION

We found a majority (73%) of the responding CAHs staff PAs or NPs, and nearly half (49%) do so for solo coverage of the ED. In Iowa, Groth et al. showed that while there was no significant change in physician staffing of EDs in Iowa between 2008 and 2012, there was a significant increase (56.5%) in the number of EDs using PAs/NPs for solo coverage. They found that 60.5% of all Iowa hospitals staffed PAs/NPs for solo coverage.[6] This increase in PA/NP use in Iowa and our survey results in Minnesota imply that PAs and NPs currently have a notable role in providing emergency care, and this may be increasing, especially in rural areas. This may in part be due to the fact that rural regions of the United States have a disproportionate shortage of physicians when compared to urban regions[8]; therefore it is unsurprising one of the main reasons survey respondents gave for hiring PAs/NPs was the low availability of physicians. Further studies would be needed to clarify how ED utilization of PAs/NPs is changing in Minnesota, and how such changes may impact ED coverage, efficiency, accessibility and patient outcomes.

Our study responses also indicate that family medicine physicians contribute to emergency department coverage in Minnesota's critical access hospitals. This is consistent with other national and state-specific studies done outside of Minnesota, which show family physicians provide emergency care in EDs, especially in rural areas. Minnesota's CAHs are, by definition, in rural areas. In a paper that explored the 2020 AMA Physician Masterfile data set, it was found that 92% of emergency medicine physicians were located in urban areas, compared to 6% in large rural areas and 2% in small rural areas.[9] Correspondingly, we found one of the top reasons survey respondents indicated for having FPs cover the ED was the low availability of EPs. Survey respondents did not commonly identify "patient acuity" as a reason for staffing selection choices (Figure 2), suggesting that ED staffing decisions may be driven by factors external to diagnostic and treatment experiences at a given CAH ED.

In 2016, Reiter et al. asserted that the shortage of board-certified emergency medicine physicians is decreasing every year. The authors projected that with the growth of emergency medicine residency programs there would be enough board-certified EPs to provide care to all patients in the U.S. EDs in the next 5-10 years.[10] While the number of board-certified EPs may be increasing overall in the U.S., rural regions continue to fall behind urban regions in terms of availability of these EPs. Our study may indicate rural Minnesota still requires contributions of FPs, and APPs to provide emergency care in CAH EDs.

This study has several limitations that require acknowledgement. Although the CAH survey respondents were scattered geographically across MN, only 48% of all the MN CAHs responded to the survey. Accordingly, the results may not be fully generalizable to all CAHs in Minnesota or elsewhere and this fact should be considered in the interpretation of the findings. The survey language did not offer an actual definition of a CAH to the respondents, the inclusion of which could have more clearly confirmed the study participant's status as a CAH. The study is also limited in that its design relied on the veracity of the respondents' knowledge of ER staffing practice at their respective facilities. The data is self-reported, and therefore unverified. There was significant variety in the employment titles of survey respondents; 57% indicated they were the hospital's CEO or president, but other respondents included operation managers, senior directors, and VPs. And notably, the study period occurred during the SARS-CoV-2 pandemic. It is not known how the stresses of COVID19 may have impacted the responses regarding staffing decisions from the participating rural CAHs.

Data collection did not include specific information about the ED staffing models, meaning that this study did could not discern if the respondents staff their emergency rooms using hospital-employed physicians, or by contracting with independent physician groups, or by contracting with large national contract companies. Specific information about ED staffing contracting at CAHs would be useful, especially if mapped out geographically to illuminate potential trends or patterns in ED staffing models. In addition, data collection did not include a systematic accounting of ED patient volumes. It is possible that emergency room visit numbers may drive staffing decisions, even between rural CAHs, as there can be a wide range of annual patient visits between different rural hospital emergency departments.

Future research directions could include exploring if hiring practices are changing within Minnesota's CAHs. CAH EDs and non-CAH EDs in Minnesota could be examined to see if differences exist between urban and rural ED workforces. One could also investigate whether there are internal site-specific training requirements within systems or individual hospitals that providers must complete to be able to provide ED coverage. Relatedly, it is not well known the extent to which healthcare organizations that serve rural geographies are developing new professional requirements for ED medical staff, nor is it well understood how such requirements might ultimately impact issues of rural access, quality and cost. And finally, expanding the research about ED staffing beyond a single state (Minnesota) targeting a multistate or regional area could result in a more comprehensive picture of ED staffing challenges and patterns.

Clinical demands on rural emergency room healthcare professionals may guide the curricular content of relevant health professional training

programs. For family medicine residency programs, core competencies for rural-bound graduates should be maintained to assure that these graduates may confidently provide high quality emergency care in rural communities. Since this study suggests that family physicians may represent a significant portion of the rural ED workforce, research about the availability, role and value of emergency medicine fellowships available to FPs will be important to better understand the resources available to FPs who seek additional expertise and experience in acute care ED settings.[11]

Notably, this study did not assess patient satisfaction, health professional well-being or disease outcomes. Future research that explores these topics will better define the emergency healthcare delivery models that are best positioned to reduce health disparities in rural populations. Recognizing the financial and staffing fragility of many rural healthcare facilities across the U.S., more study is warranted to expand our understanding of how ED staffing models may impact community health, healthcare professional wellness and retention as well as the CAH's financial viability.

CONCLUSION

While there was variety among the staffing practices of Minnesota's CAH EDs, most of our study's respondents report utilization of FPs for ED coverage. The majority of respondents also reported staffing PAs or NPs in the ED, a practice more commonly found at CAHs associated with larger health systems. Nearly half of the CAHs that responded staff PAs or NPs for solo ED coverage, with solo staffing of PAs/NPs more frequently reported at CAHs affiliated with larger healthcare systems than at independent CAHs. Much of rural Minnesota may be unable to provide necessary emergency care without the contribution of FPs, NPs, and PAs. To ensure ED coverage, CAH administrators do not appear to be motivated by specialty preference in their staffing practices, but rather more pragmatic considerations of staff availability. Cooperation between specialties should be recommended in order to strengthen emergency care. Future research is needed to better understand the factors that influence rural ED staffing decisions and how these decisions impact ED health professional wellness and job satisfaction, professional training programs, CAH financial viability, and ultimately the health of rural populations.

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Appendix A: Qualtrics survey questions

1. Is your hospital considered a critical access hospital (CAH)?
    a. Yes
    b. No

2. What is your employment title?

3. How many active inpatient beds does your hospital have?

4. What is the typical annual patient volume of your hospital?

5. In what zip code is the Emergency Department located?

6. Is your hospital independent or part of a larger health system/network?
    a. Independent
    b. Part of a larger health system/network

7. Do you staff physician assistants (PA) or nurse practitioners (NP)? If so, for solo coverage, as a second provider, or both?
    a. Yes, for solo coverage
    b. Yes, as a second provider
    c. No, PAs and NPs are not staffed

8. In an average week (168 hours), please estimate the percentage of your Emergency Department coverage that is *solely* provided by PAs/NPs:

9. In an average week (168 hours), please estimate the percentage of your Emergency Department coverage that utilizes PAs/NPs as an additional provider to a physician:

10. If PAs/NPs are hired, which of the following best explains the reasons for hiring PAs/NPs?
    a. Quality of care provided by PAs/NPs.
    b. Lower salaries for PAs/NPs.
    c. Low availability of physicians.
    d. To compete with surrounding communities' emergency departments.
    e. Low patient volume is best supported by PAs/NPs
    f. Low patient acuity decreases the need for physicians
    g. PAs/NPs generate higher billing.
    h. Malpractice insurance rates are lower for PAs/NPs.
    i. To provide continuity of care for patients.
    j. To support physicians during high patient volume.
    k. Staff physicians prefer not to staff the ED
    l. Other
    m. Comments:
    n. Not applicable; PAs or NPs are not staffed

11. What are the required specialty qualifications of physicians who provide medical care in your emergency department?
    a. Exclusively Emergency Medicine specialty-trained physicians?
    b. Exclusively Family Medicine specialty-trained physicians?
    c. Combination of Emergency Medicine/Family Medicine/Internal Medicine physicians?
    d. Other:

12. If emergency medicine trained physicians are staffed, which of the following best explains the reason for hiring emergency medicine physicians?
    a. Quality of care provided by emergency physicians.
    b. Higher efficiency of emergency physicians.
    c. Availability of emergency physician applicants.
    d. To compete with surrounding communities' emergency departments.
    e. High patient volume supports hiring of emergency physicians.
    f. High patient acuity supports hiring of emergency physicians.
    g. Emergency physicians generate higher billing.

   h. Malpractice insurance rates are lower for emergency physicians.
   i. Other
   j. Comments:
   k. Not applicable; emergency medicine trained physicians are not staffed

13. If family medicine trained physicians are hired, which of the following best explains the reason for hiring family physicians?
   a. Quality of care provided by family physicians.
   b. Lower salaries for family physicians.
   c. Low availability of emergency physicians.
   d. To compete with surrounding communities' emergency departments.
   e. Low patient volume is best supported by family physicians.
   f. Low patient acuity decreases the need for emergency physicians.
   g. Family physicians generate higher billing.
   h. Malpractice insurance rates are lower for family physicians.
   i. To provide improved continuity of care for patients.
   j. Other
   k. Comments:
   l. Not applicable; family medicine trained physicians are not staffed

14. If internal medicine trained physicians are hired, which of the following best explains the reason for hiring internists?
   a. Quality of care provided by internists.
   b. Lower salaries for internists.
   c. Low availability of emergency physicians.
   d. To compete with surrounding communities' emergency departments.
   e. Low patient volume is best supported by internists.
   f. Low patient acuity decreases the need for emergency physicians.
   g. Internists generate higher billing.
   h. Malpractice insurance rates are lower for internists.
   i. To provide continuity of care for patients.
   j. Other
   k. Comments:
   l. Not applicable; internal medicine trained physicians are not staffed

15. In an average week (168 hours), please estimate the percentage of your Emergency Department coverage that is provided by the following physician specialties (not including PAs and NPs):
   a. Emergency medicine physicians: ___%
   b. Family medicine physicians: ___%
   c. Internal medicine physicians: ___%

16. What is the Emergency Department's ideal provider staffing scenario?

17. If the current scenario differs from what is ideal, which of the following best explains the difference?
   a. Low availability of EM physicians.
   b. Low availability of internal medicine or family physicians.
   c. Low availability of PAs/NPs.
   d. Staff providers unwilling to staff the ED.
   e. Limited financial resources to hire desired providers.
   f. Inability to recruit desired providers.
   g. Limited training/comfort providing emergency care among staff providers.
   h. High expense of locum tenens companies
   i. Other
   j. Comments:
   k. Not applicable; current scenario is ideal