



# Availability of Acute Care Pediatric Nurse Practitioner Education in the United States: A Challenge to Growing the Workforce

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## KEY WORDS

Pediatric nurse practitioner, acute care, graduate nursing education

The nurse practitioner (NP) workforce in the United States is growing rapidly in size, with a concomitant impact on the health care system (American Association of Nurse Practitioners [AANP], 2019a; Auerbach, Staiger, & Buerhaus, 2018). Likewise, the number of graduate nursing education programs offering NP degrees and the number of graduates have also grown substantially (Salsberg, 2018). Starting from

2008, the nursing profession has emphasized the need for alignment of NPs' education, certification, licensure, and clinical practice setting (APRN Consensus Workgroup & National Council of State Boards of Nursing APRN Advisory Committee, 2008). However, there has been discordant growth in NP education program availability relative to the continuing unmet demand for specialty-trained NPs.

Most graduates from NP programs are certified in primary care practice areas. Family NP graduate nursing education programs and the number of NPs certified in family practice have experienced the greatest growth, representing 70% of all new NPs graduates and nearly 60% of NP certifications (AANP, 2019a). As family NP programs and the number of family NP graduates experience significant growth, other NP specialties face significant barriers to sustained growth (Auerbach et al., 2012; Delaney & Vanderhoef, 2019; Gigli, Beauchesne, Dirks, & Peck, 2019; Martsolf et al., 2018).

In particular, the acute care pediatric NP specialty has not experienced any appreciable growth in the size of the workforce (AANP, 2019a; Freed, Dunham, Loveland-Cherry, & Martyn, 2010). However, inpatient pediatric physicians across multiple clinical specialties want to increase the integration of pediatric NPs (Freed et al., 2011). In pediatric critical care, wherein acute care certification is clearly aligned with the clinical roles, the demand to increase NP presence is greatest (Freed et al., 2011; Gigli, Dietrich, Buerhaus, & Minnick, 2018a; Haut & Madden, 2015). In the past 15 years, the number of pediatric intensive care units (PICUs) employing NPs has doubled (Horak et al., 2019). However, because the vast majority of NP graduates are family NPs, pediatric acute care hospitals face two unenviable options.

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First, hospitals can choose to forgo hiring NPs despite the unmet needs. Currently, NPs only work in less than half (44%) of PICUs, with NPs typically only providing coverage during a portion of the 24-hr intensive care unit day, indicating opportunities for expansion of NPs' presence in PICUs (Horak et al., 2019). Second, in some states, hospitals can choose to hire NPs who are not formally educated or certified in pediatric acute care. NP certification misalignment places a demand on hospitals to provide role-relevant "on the job training" and may increase liability for NPs considered to be practicing outside of their scope (Buppert, 2017; Hoffman & Guttendorf, 2017). Now, less than half of the PICUs require NPs to hold acute care certification (Gigli, Dietrich, Buerhaus, & Minnick, 2018b).

Factors preventing the growth and proliferation of the acute care pediatric NP workforce are multifactorial; however, the availability of acute care pediatric NP educational programs is likely to be an important determinant of workforce growth. In recent years, acute care pediatric NP programs have expanded capacity, and new programs have opened; however, these programs are likely not keeping pace with the growth of other NP specialties or with the unmet demand for acute care pediatric NPs (Freed et al., 2015). In addition, although some pediatric NP graduate nursing education programs have waiting lists, others operate below capacity, suggesting that even the current supply of pediatric NP programs is not well distributed (Freed et al., 2015).

All told, little is known about the accessibility of schools of nursing with acute care pediatric NP programs. The purpose of this study was to determine (1) the availability of acute care pediatric NP graduate nursing education programs nationally and (2) the proximity of these programs to hospitals with a PICU. Such units are sources of demand for acute care pediatric NPs as well as incubators of potential graduate nursing students and clinical preceptors.

## METHODS

We conducted a descriptive cross-sectional analysis of secondary data sources to evaluate the location of and degree options available in pediatric and family NP graduate nursing education programs and the location of pediatric acute care NP programs relative to PICUs.

### Data Sources

#### Nurse practitioner programs

We queried the AANP NP program database to identify schools of nursing with any pediatric graduate nursing education programs (acute care, primary care, or dual primary and acute care). We collected the same information for family NP graduate nursing education programs as our reference point. In addition to the presence of one of these NP programs, we obtained information on the degree options (master's, post-master's, post-baccalaureate Doctorate of Nursing, and post-master's Doctorate of Nursing) available in pediatric and family NP programs along with the amount

of distance education provided in the master's and post-master's pediatric NP degree programs from this database. The AANP database included data provided by the American Association of Colleges of Nursing as of Fall 2017 (AANP, 2019b). Subsequently, we visited the schools of nursing website to find the schools' geographic location, including city, state, and ZIP code. We used published statistics on the number of students and graduates from the graduate nursing education programs of interest and the amount of distance education provided in family NP programs in the 2017–2018 academic year (American Association of Colleges of Nursing, 2018).

#### Pediatric intensive care unit location

As part of a previous study, in the Summer of 2016, we contacted hospitals identified as operating a PICU in the 2015 American Hospital Association (AHA) Annual Survey to confirm the continued operation of a PICU (Gigli et al., 2018b). We included all hospitals with a PICU in this analysis. We used geographic data reported in the AHA Annual Survey to determine the hospital location for this study (AHA, 2015). We generated latitude and longitude variables using the school of nursing and the PICU zip code data (CivicSpace Labs, 2018).

#### Data Analysis

Our primary variable of interest was the presence of a pediatric or family NP program in a school of nursing. Secondary variables of interest included the distribution of NP programs, type of degree programs offered, amount of distance education offered, and distance from PICUs to schools of nursing with acute care pediatric NP programs.

We created a variable to measure the distance from hospitals with PICUs to schools of nursing with acute care pediatric NP programs. Using the global positioning system latitude and longitude coordinates, we measured straight-line distances from hospitals with PICUs to schools of nursing with acute care pediatric NP programs to find the "nearest neighbor," using the *geonear* package available in Stata (StataCorp, 2019). We then categorized the distance variable on the basis of typical driving patterns in the United States (U.S. Department of Transportation, 2017). The categories used by the U.S. Census Bureau reflect one-way driving distances and include (1) a typical daily work commute, which is a driving distance of 7 mi; (2) an average daily driving distance, which includes the distances traveled to commute and complete daily household activities (e.g., shopping, appointments) of 35 mi, and for this study, included distances up to 49.9 mi; and (3) a "mega commute," with a driving distance of greater than 50 mi (U.S. Census Bureau, 2013; U.S. Department of Transportation, 2017). We further divided the mega commute into distances from 100 to 199.9 mi and farther than 200 mi to highlight differences in the distance in some regions.

We analyzed the school of nursing and the program data using descriptive statistics. Frequency distributions summarize nominal and ordinal data distributions; we report

median and interquartile range for the continuous data because of skewness. We performed all statistical analyses using Stata 15.0 (StataCorp; College Station, Texas).

## RESULTS

There are 42 schools of nursing that offer acute care pediatric NP programs in the United States, which compares with 97 schools with primary care pediatric NP programs and 417 schools with family NP programs (Table 1). Similarly, there are fewer total acute care pediatric NP students, 948, than 3,218 total primary care pediatric NP students, a 1:3 ratio, and 65,057 family NP students, a 1:68 ratio. As graduate nursing education shifted toward the Doctorate of Nursing Practice (DNP), such as other NP programs, acute care pediatric NP programs offered these degree programs at similar rates; half of all schools of nursing with an acute care pediatric NP programs offer a DNP program compared with 44% of schools of nursing with family NP programs. Typically, acute care pediatric NP programs are smaller than the family NP programs, with an average graduating class size of seven graduates from acute care pediatric NP programs and 46 students graduating family NPs per program.

### Availability of Acute Care Pediatric Nurse Practitioner Programs

The distribution of acute care pediatric NP programs is not uniform across the country (Figure 1). Currently, there are

acute care pediatric NP programs located in 24 states and Washington D.C., compared with family NP programs in 49 states and Washington D.C. More than a quarter of acute care pediatric NP programs are in four states: Ohio, Michigan, Illinois, and Wisconsin, which are in the West North Central region of the United States (Table 2). In contrast, the New England and the Mountain regions, which represent 13 states, have just a single acute care pediatric NP program each. In addition, in California, where there are more than 9 million children, there are only two acute care pediatric NP programs (Kaiser Family Foundation, 2019).

### Alignment of Pediatric Intensive Care Unit and Acute Care Pediatric Nurse Practitioner Program Location

When considering the distribution of acute care pediatric NP programs in relationship to hospitals in which there are PICUs and the possibility for the employment of acute care pediatric NPs, there are regional disparities in program availability (Figure 1 and Table 3). The average distance from a PICU in the United States to a school of nursing with an acute care pediatric NP program was 56 mi. Not all regions have distance as a barrier when examining PICUs' proximity to schools of nursing with acute care pediatric NP programs. In the East South Central region, most (60%) PICUs are within an average work commute of an acute care pediatric NP program, and a majority (85%) of the PICUs in the

**TABLE 1. Number of schools with an NP program in the United States by type of NP program**

NP program characteristics	Schools <sup>a</sup>	Students <sup>b</sup>	Graduates <sup>c</sup>
Program type			
Any pediatric NP program	99	4,428	1,359
Acute care pediatric NP	42	948	308
Primary care pediatric NP	97	3,218	1,018
Dual acute care/primary care pediatric NP	7	262	33
Family NP	417	65,057	19,261
Degree options by program <sup>a</sup>			
Acute care pediatric NP	42	948	308
Master's	31 (73.8)	584 (61.6)	203 (65.9)
Post-master's	30 (71.4)	99 (10.4)	65 (21.1)
Post-bachelor's Doctor of Nursing Practice	21 (50.0)	239 (25.2)	36 (11.7)
Post-master's Doctor of Nursing Practice	21 (50.0)	26 (2.7)	4 (1.3)
Primary care pediatric nurse practitioner	97	3,218	1,018
Master's	78 (80.4)	2,459 (76.4)	830 (81.5)
Post-master's	56 (57.7)	84 (2.6)	46 (4.5)
Post-bachelor's Doctor of Nursing Practice	55 (56.7)	597 (18.6)	134 (13.2)
Post-master's Doctor of Nursing Practice	54 (55.7)	78 (2.4)	8 (0.8)
Dual acute care/primary care pediatric NP	7		
Master's	6 (85.7)	262	33
Post-master's	3 (42.8)		
Family nurse practitioner	417	65,057	19,261
Master's	335 (80.3)	54,644 (84.0)	16,856 (87.5)
Post-master's	241 (57.8)	2,552 (3.9)	1,088 (5.6)
Post-bachelor's Doctor of Nursing Practice	185 (44.4)	7,348 (11.3)	1,179 (6.1)
Post-master's Doctor of Nursing Practice	183 (43.9)	513 (0.8)	138 (0.7)

Note. Values are *n* (%).

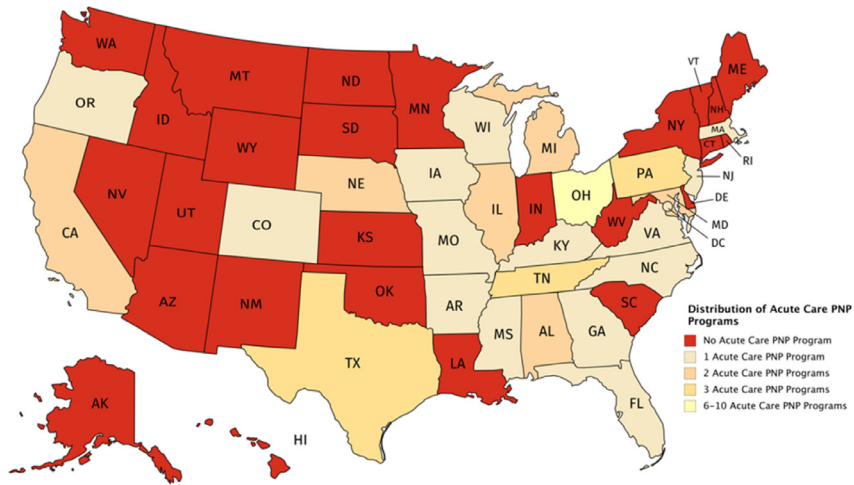
<sup>a</sup>Some schools have more than one degree program.

<sup>b</sup>Number of students enrolled in the program in the Fall of 2017.

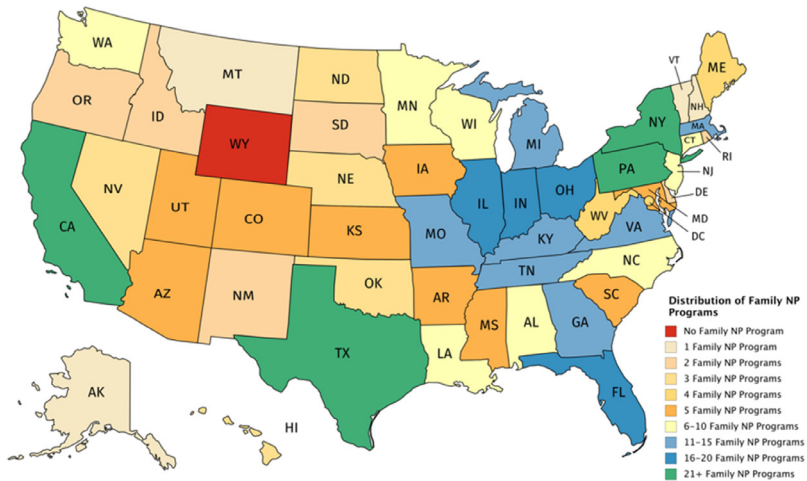
<sup>c</sup>Number of students who graduated from August 1, 2016, to July 31, 2017.

**FIGURE 1. Distribution of pediatric nurse practitioner programs (panel A, acute; panel B, family) and pediatric intensive care units (panel C) across the United States**

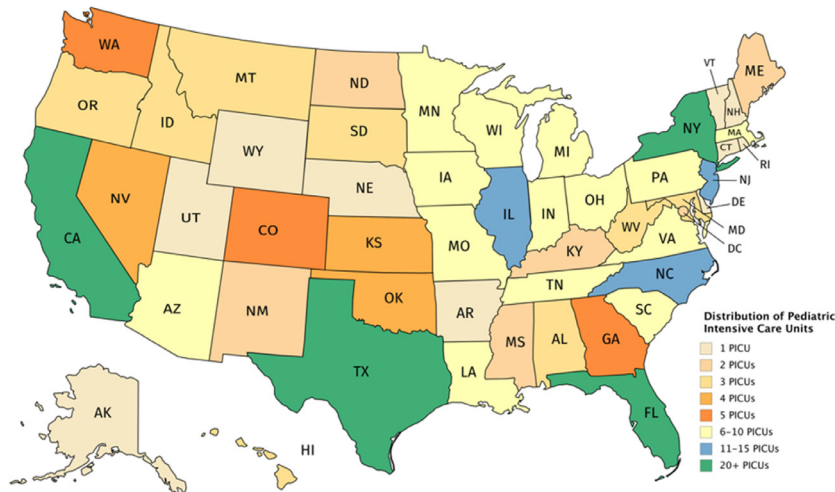
A. Acute Care Pediatric Nurse Practitioner Programs



B. Family Nurse Practitioner Programs



C. Pediatric Intensive Care Units



(This figure appears in color online at [www.jpeds.org](http://www.jpeds.org).)

**TABLE 2. Regional distribution of schools of nursing with pediatric or family NP graduate education programs in the United States**

Nurse practitioner program <sup>a</sup>	School of nursing location <sup>b</sup>								
	New england	Mid-atlantic	East north central	West north central	South atlantic	East south central	West south central	Mountain	Pacific
Pediatric acute care (N = 42)	1 (2.4)	4 (9.5)	11 (26.2)	4 (9.5)	7 (16.7)	7 (16.7)	4 (9.5)	1 (2.4)	3 (7.1)
Pediatric primary care (N = 97)	5 (5.2)	15 (15.5)	16 (16.5)	10 (10.3)	15 (15.5)	12 (12.4)	9 (9.3)	6 (6.2)	9 (9.3)
Dual pediatric acute/primary care (N = 7)	0 (0)	1 (14.3)	2 (28.6)	1 (14.3)	1 (14.3)	2 (28.6)	0 (0)	0 (0)	0 (0)
Family (N = 417)	27 (6.5)	58 (13.9)	76 (18.2)	37 (8.9)	73 (17.5)	40 (9.6)	43 (10.3)	23 (5.5)	40 (9.6)

<sup>a</sup>Some schools offer more than one program and/or degree type.

<sup>b</sup>Regions include the following states that have at least one NP program: New England: CT, MA, ME, NH, RI, and VT; Mid-Atlantic: NJ, NY, and PA; East North Central: IL, IN, MI, OH, and WI; West North Central: IA, KS, MN, MO, NE, ND, and SD; South Atlantic: DC, DE, FL, GA, MD, NC, SC, VA, and WV; East South Central: AL, KY, MS, and TN; West South Central: AR, LA, OK, and TX; Mountain: AZ, CO, ID, MT, NM, NV, and UT; Pacific: AK, CA, HI, OR, and WA.

**TABLE 3. Distance from a hospital with a pediatric intensive care unit to the nearest acute care pediatric NP program by region**

Distance to nearest School of nursing (miles) <sup>a</sup>	Region									
	Total (N = 325)	New england (n = 13)	Mid-atlantic (n = 46)	East north central (n = 48)	West north central (n = 31)	South atlantic (n = 66)	East south central (n = 15)	West south central (n = 41)	Mountain (n = 26)	Pacific (n = 39)
Average distance (SD)	56.0 (103.7)	55.9 (70.7)	11.9 (21.4)	33.8 (40.1)	61.1 (75.1)	52.1 (40.2)	23.8 (36.4)	79.8 (93.9)	97.8 (135.2)	64.1 (229.7)
Median distance (IQR)	13.4 (3.6, 75.6)	26.0 (1.7, 96.7)	5.6 (1.9, 10.8)	12.0 (3.2, 65.9)	25.4 (2.2, 107.5)	58.4 (9.0, 84.8)	5.0 (0, 69.2)	24.9 (4.4, 186.8)	12.8 (4.2, 186.6)	18.5 (4.0, 33.5)
< 7	59 (18.2)	4 (30.8)	7 (15.2)	13 (27.1)	3 (9.7)	9 (13.6)	9 (60.0)	6 (14.6)	2 (7.7)	6 (15.4)
7–49	84 (25.9)	3 (23.1)	30 (69.6)	12 (29.2)	4 (12.9)	4 (6.1)	1 (6.7)	3 (7.3)	2 (7.7)	15 (53.9)
50–99	44 (13.5)	3 (23.1)	2 (4.4)	9 (18.8)	1 (3.2)	19 (28.8)	5 (33.3)	0	1 (3.9)	4 (10.3)
100–199	70 (21.5)	2 (15.4)	4 (8.7)	11 (22.9)	11 (35.5)	21 (31.8)	0	14 (34.2)	1 (3.9)	6 (15.4)
≥ 200	68 (16.6)	1 (7.7)	1 (2.7)	1 (2.1)	12 (38.7)	13 (19.7)	0	18 (43.9)	20 (76.9)	2 (5.1)

Note. IQR, interquartile range; SD, standard deviation.

Values are n (%) unless otherwise specified.

<sup>a</sup>Regions include the following states that have at least one NP program: New England: CT, MA, ME, NH, RI, and VT; Mid-Atlantic: NJ, NY, and PA; East North Central: IL, IN, MI, OH, and WI; West North Central: IA, KS, MN, MO, NE, ND, and SD; South Atlantic: DC, DE, FL, GA, MD, NC, SC, VA, and WV; East South Central: AL, KY, MS, and TN; West South Central: AR, LA, OK, and TX; Mountain: AZ, CO, ID, MT, NM, NV, and UT; Pacific: AK, CA, HI, OR, and WA.



**TABLE 4. Amount of distance education available in United States Master's and Post-Master's level NP education programs**

Amount of distance education	Master's degree NP programs			Post-master's degree NP programs		
	Total (N = 369)	PNP-AC (n = 31)	PNP-PC (n = 78)	Total (N = 305)	PNP-AC (n = 30)	PNP-PC (n = 56)
None	54 (14.6)	3 (9.7)	12 (15.4)	44 (14.4)	1 (3.3)	6 (10.7)
Less than 25%	87 (23.6)	11 (35.5)	29 (37.2)	68 (22.3)	8 (26.7)	14 (25.0)
25–50%	70 (19.0)	5 (16.1)	10 (12.8)	55 (18.0)	5 (16.7)	11 (19.6)
51–99%	108 (29.3)	9 (29.0)	18 (23.1)	92 (30.2)	10 (33.3)	16 (28.6)
100%	50 (13.6)	3 (9.7)	9 (11.5)	46 (15.1)	5 (16.7)	9 (16.1)

Note. PNP-AC, pediatric nurse practitioner-acute care; PNP-PC, pediatric nurse practitioner-primary care.

Mid-Atlantic region are within an average daily drive of an acute care pediatric NP program. However, in the West North Central and West South Central regions, the distance to most PICUs is a mega commute, more than 100 mi, from an acute care pediatric NP program. The greatest distance between PICUs and programs is in the Mountain region, where more than 75% of PICUs are more than 200 mi from schools of nursing with acute care pediatric NP programs.

The use of distance (online) education could provide an alternative for students who are interested in pursuing graduate nursing education but are geographically far from a school of nursing with an acute care pediatric NP program (National Council of State Boards of Nursing, 2015). Among degree programs, NPs who pursue a post-master's acute care pediatric NP education have the greatest options for obtaining all of their graduate nursing education through distance education (Table 4). Students in other acute care pediatric NP degree programs have comparable distance education opportunities to other graduate-level NP programs. Overall, most acute care pediatric NP programs offer at least some of the programs via distance education (90.3% of master's degree programs; 96.7% of post-master's degree programs).

## DISCUSSION

This study examines the availability of acute care pediatric NP education programs in the United States. The acute care pediatric NP workforce has not experienced growth similar to other NP specialties, and demand is likely surpassing supply (AANP, 2019a; Freed et al., 2015). Although the causes for this are multifactorial, the availability of acute care pediatric NP educational programs is an essential element of workforce growth and development. We found the number of acute care pediatric NP programs to be significantly lower than other NP specialties, with smaller student cohorts. We also identified significant regional disparities in the access to local educational opportunities. The disparity persisted when considering the proximity of these programs to PICUs, potential incubators, clinical educators, and employers of acute care pediatric NPs.

The growth in the family NP workforce has eclipsed the growth of other NP specialties. Students often choose family NP programs because they believe that the family NP degree is highly marketable, equipping graduates to care for

patients across their life span (AANP, 2019a). However, this means that there may be a growing surplus of family NP graduates and a dearth of other specialty-trained NPs, particularly those whose education and certification align with pediatric, hospital-based roles (Haut & Madden, 2015).

Given the latent demand for pediatric, hospital-based NPs, hospitals hire NPs who may have a clinical nursing background in pediatric hospital care but lack pediatric acute care NP certification (Gigli, Dietrich, Buerhaus, & Minnick, 2018b). In turn, employers increasingly provide new graduate NPs with extensive, paid onboarding to provide skills not taught in NP programs (Martsof, Nguyen, Freund, & Poghosyan, 2017; Stojadinovic et al., 2019). At the same time, state practice regulations may force hospitals to address specialty misalignment. *The Consensus Model for Advanced Practice Registered Nurse (APRN) Regulation: Licensure, Accreditation, Certification and Education (The Consensus Model)* encourages NPs' specialty education, certification, and licensure to be consistent with their clinical practice setting (APRN Consensus Workgroup & National Council of State Boards of Nursing APRN Advisory Committee, 2008). *The Consensus Model* does not support family NPs practicing in acute care settings. As states fully adopt *The Consensus Model*, state boards of nursing require hospitals to hire only NPs whose education and certification align with their practice (Gonzales, 2017). Ultimately, NPs whose education, certification, and practice are misaligned and who plan to continue working in pediatric, hospital-based settings may be required to obtain additional graduate nursing education to maintain their current position, accruing additional financial and opportunity costs.

Furthermore, nursing schools will need to drastically increase their capability to educate acute care NPs. Opening new acute care pediatric NP programs and expanding existing programs particularly allowing for adequate clinical placement experiences are time- and labor-intensive (Accreditation Commission for Education in Nursing, 2019; Commission on Collegiate Nursing Education, 2019). Thus, given the relative paucity of some specialty NP programs, state licensing bodies must allot realistic timelines in the transition to full implementation of the *Consensus Model* or face potential workforce crises within the health care delivery system across their states.

Schools of nursing have a responsibility to educate and guide students toward graduate nursing education programs

that align with their career goals, not in response to the perceived marketability of one degree program versus another or local program availability. However, this means that there is a need to expand the availability of acute care pediatric NP programs, which is associated with additional costs. The United States Congress introduced the [Title VIII Nursing Workforce Reauthorization Act of 2019](#) that supports nursing education and aims to strengthen the nursing workforce. Although this legislation focuses on the development of the primary care workforce, when passed, support for the development of subspecialty NP workforces should be incorporated into the funding appropriation as well. In addition, development of acute care pediatric NP education programs introduces an opportunity for schools of nursing to partner with academic and community hospitals in program development to better match the supply of these providers to the demand, target the education of NP students with specialty practice needs and clinical roles in the hospitals as graduate NPs, and facilitate interprofessional clinical education.

As our study shows, there is a paucity of acute care pediatric programs to educate greater numbers of acute care pediatric NPs. However, as new education programs are developed, opportunities to obtain an acute care pediatric NP education via distance education or at a DNP-level of preparation are reflective of those in other graduate NP programs. However, more distance education programs may not result in acute care pediatric NP workforce growth. Distance education has increased in prevalence, but the robustness of these programs and student experiences with and preferences for distance graduate education programs remain uncertain ([Cook et al., 2008](#); [Huckstadt & Hayes, 2005](#); [Stocker, 2018](#)). Furthermore, the state regulatory approval process associated with offering distance graduate education is dynamic, burdensome, requires careful oversight, and may be prohibitive to program growth ([Ellis et al., 2017](#)). In regions where the population is sparse and there is limited local access to an acute care pediatric NP program, such as the Mountain region, the adaptation of graduate medical education program models, such as Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) Regional Medical Education Program, may increase access to specialty graduate nursing education. The WWAMI program is a regionalized medical education model in Washington, Wyoming, Alaska, Montana, and Idaho, which permits residents of these five states to access one regional education program at in-state tuition rates ([University of Washington, 2019](#)). A similar approach to graduate nursing education may address some of the barriers for students with an interest in obtaining acute care pediatric NP education.

In addition, the benefit of DNP programs is under scrutiny. As these programs have grown, most focus on providing advanced education in administration or leadership on top of the clinical education provided in master's level NP programs not offering advanced clinical education ([Mundinger & Carter, 2019](#)). The roles of practicing NPs who hold a DNP are similar to that of non-DNP NPs, and the additional value added in clinical care by these providers has not been clearly demonstrated or thoroughly examined ([Beeber, Palmer, Waldrop,](#)

[Lynn, & Jones, 2019](#)). Given the additional time and cost required to obtain a DNP degree, unclear aggregate benefits offered by DNP providers, and the decades of education demonstrating master's level NPs are safe and effective providers, expansion of master's level acute care pediatric NP programs may be adequate to meet the health care needs of the population ([Kleinpell, Grabenkort, Kapu, Constantine, & Sicoutris, 2019](#); [Newhouse et al., 2011](#)).

## Limitations

This study utilized secondary data analysis. Although the data sources used to determine NP program availability are nationally representative and available from respected professional organizations, there are limitations in the availability of the data. Specifically, there are no publicly available data on the size of dual acute and primary care pediatric NP degree program options, the amount of distance education in DNP programs, and the focus of the DNP programs (clinical, administrative, or leadership). In addition, the data used in the analysis is cross-sectional and prohibits analysis that examines trends in program availability over time. Despite these limitations, we believe there is enough data available to conduct this analysis and provide an understanding of acute care pediatric NP program availability.

As with all workforce data, there are limitations with understanding the true demand for any specific provider type. Not all PICUs will employ acute care pediatric NPs given the local culture and practices. However, we utilized the presence of a PICU to indicate that a hospital offers pediatric care that aligns with an acute care pediatric NP's education and certification. It is also reasonable to assume that hospitals with a PICU have other pediatric specialty providers (i.e., cardiology, pulmonology, neurology), and those specialists might employ acute care pediatric NPs regardless of PICU employment practices, contributing to the latent demand for acute care pediatric NPs.

## CONCLUSION

There are disparities in the availability of acute care pediatric NP programs across the United States. Opportunities exist to increase the presence of acute care pediatric NP programs in partnership with hospitals that have PICUs and might reasonably employ these providers after graduation. There remains an ongoing role for the examination of factors preventing the growth and proliferation of the acute care pediatric NP workforce, including the role of the availability of acute care pediatric NP education programs.

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## SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.pedhc.2020.01.006>.

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