A Longitudinal Pediatric Primary Care Residency Tailored to Meet Workforce Need: A 10-Year Evaluation

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ABSTRACT

Background We started a primary care residency program intended to prepare graduates for primary care and increase entry into primary care, using time-limited funds from the Health Resources and Services Administration (HRSA).

Objective To compare the graduates of the primary care residency program to their categorical peers, and whether they remained in the state, began primary care careers, and whether they identified as underrepresented in medicine.

Methods This is a retrospective study of a cohort of 39 residents who graduated from the University of North Carolina primary care residency program from 2014-2023. In 2016, HRSA grant funding expired and the program continued with ongoing financial support from the 2 institutions. Graduate demographics and career choices were compared to categorical residents (159 total) for graduate years 2014 to 2023.

Results The primary care pediatrics residency has graduated 39 residents to date. Job placement data was obtained for all 39 graduates. Graduates of the program have 5.5-fold greater odds (95% CI, 2.5-12.5) of working in primary care roles following graduation than peer categorical residents. Most graduates (33 of 39, 85%) have taken jobs in general pediatrics (including primary care, urgent care, adolescent medicine, or hospital medicine). The program has recruited a large proportion of its residents (12 of 39, 31%) from groups historically underrepresented in medicine.

Conclusions We developed an innovative primary care pediatric residency in collaboration with a community partner, spurred by HRSA funds, that has trained a diverse group of new primary care pediatricians.

Introduction

Primary care practitioners are the cornerstone of the medical home. The demand for their services, driven by population growth and improved access to health insurance under the Affordable Care Act (ACA) of 2010, exceeds the supply of new physicians entering the workforce.[1] Recruitment and retention into pediatric primary care faces headwinds from multiple directions: pay disparity compared to adult care, challenges in addressing social determinants of health, and disproportionate exposure to inpatient care during residency training, among others.[2] Creating a program that trains and retains future primary care physicians presents a challenge for graduate medical education (GME) program leadership.

The ACA included federal funding provisions to address this workforce need. In 2010, the University of North Carolina (UNC) Department of Pediatrics was awarded a $3.7 million Health Resources and Services Administration (HRSA) Primary Care Residency Expansion grant covering resident salary and direct expenses for a cohort of 4 interns per class, expanding its program in collaboration with an academic community partner, Cone Health. The goal of the program was to use a dedicated curriculum and increased outpatient exposure to better prepare residents for a career in primary care, and in doing so, retain a higher proportion of graduates in the primary care workforce. Trainees hoping to matriculate to this residency program interviewed and ranked the program as part of a distinct National Resident Matching Program match. The UNC pediatrics primary care residency offered its first 4 slots to students matriculating residency in 2011 in this distinct match. In this paper we summarize early-career outcomes for graduates of the primary care track in comparison to peers in the categorical residency.

Methods

This study is a retrospective cohort study evaluating the 39 graduates of the UNC primary care residency and comparing them to the 159 graduates of the UNC categorical residency program from 2014 to 2023 (corresponding to matriculation in 2011 through

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TABLE
Demographics and Job Placements of Study Cohort

Demographics	Primary Care Track, n (%)	Categorical Track, n (%)	Total, n (%)	*P* value[a]
Sex				
Female	33 (85)	118 (74)	151 (76)	
Male	6 (15)	41 (26)	47 (24)	
Total	39 (100)	159 (100)	198 (100)	.21
Race/ethnicity				
Self-identified UIM[b]	12 (31)	18 (11)	30 (15)	
Other	27 (69)	141 (89)	168 (85)	
Total	39 (100)	159 (100)	198 (100)	.005
First job				
Primary care	27 (69)	44 (28)	71 (36)	
Other general pediatrics[c]	6 (15)	31 (19)	37 (19)	
Subspecialty pediatrics	6 (15)	81 (51)	87 (44)	
Not available	0 (0)	3 (2)	3 (2)	
Total	39 (100)	159 (100)	198 (100)	(see text)

[a] *P*-value for Fisher exact test of difference in proportions of demographic variables according to residency track.
[b] Categorization based self-identified membership in groups deemed "underrepresented in medicine" by the Executive Council of the Association of American of Medical Colleges.
[c] Includes hospital medicine, adolescent medicine, and urgent care but not outpatient primary care roles.
Abbreviation: UIM, underrepresented in medicine.

2020). An HRSA Primary Care Residency Expansion grant provided full funding for the first 5 years but was not renewable. After 2016, the program was supported with clinical funds from UNC and Cone Health. Participant demographics were obtained via residency applications, and initial job placements for graduates were obtained from personal communications with residency program leadership. Status as underrepresented in medicine (UIM) was based on self-reported racial and ethnic identity and followed the definition set by the Association of American Medical Colleges Executive Council.[3] In our program evaluation, residents self-identifying as Black, American Indian, Pacific Islander, or Latinx were classified as UIM. We define primary care as outpatient pediatric primary care practice. We define general pediatrics as practice including primary care pediatrics, general pediatric hospital medicine, urgent care, and adolescent medicine.

Associations between initial job placement and residency were estimated with logistic regression in a Bayesian generalized linear mixed model framework. Job placement was encoded as a binary response (primary care or not primary care, general pediatrics or not, in North Carolina or not). Residency, sex, and UIM status were included as fixed effects, and graduation year was included as a random effect. The estimates of odds ratios presented in the text are posterior means with corresponding 95% credible intervals. All statistical analyses were performed in R v4.1.1 using the "rstanarm" package (Comprehensive R Archive Network) for regression models. The UNC IRB committee determined the evaluation of the program was exempt from full review.

Results

Employment status was available for all 39 graduates of the primary care residency program and for 156 of 159 (98%) graduates of the categorical pediatrics residency. A large majority (33 of 39, 85%) of graduates of the primary care residency have entered the general pediatric work force (TABLE). When compared to the categorical residents, the primary care cohort has 5.5-fold higher odds (95% CI, 2.5-12.5) of working in primary care roles following graduation, after adjustment for UIM status, sex, and graduation year. When expanding to include other general pediatrics positions, including hospital pediatrics, urgent care, and adolescent medicine, graduates of the primary care residency had 5.8-fold higher odds (95% CI, 2.9-12.8) of working in general pediatrics following graduation than those from the categorical residency. The proportion of graduates of the primary care track employed in primary care—85% (95% CI, 70-93%) is significantly greater than the national rate of 54.2% (95% CI, 53.7-54.7%) among pediatricians enrolled in maintenance of certification.[4]

In addition, graduates of the primary care residency program were 3.3 times more likely (95% CI,

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1.4-7.4) to be from racially diverse groups, with 12 of 39 (31%) from groups traditionally UIM compared to 18 of 159 (11%) categorical residents. There was no statistical difference between the 2 residencies in whether residents chose to stay in North Carolina for their first job placement with 23 of 39 (59%) primary care graduates and 93 of 156 (60%) categorical graduates remaining in North Carolina (odds ratio 1.0, 95% CI, 0.5-1.7).

Discussion

Increasing the supply of primary care pediatricians, particularly in rural or underserved areas, has been identified as a priority by the US Department of Health and Human Services and the American Academy of Pediatrics.[5,6] This is an immense challenge that requires effort across many levels, from undergraduate medical curricula,[7] to residency training, to payment reform. Of particular interest to those involved in graduate medical training is reform of GME funding to increase not just the number of residency positions available but their distribution with respect to need.[8,9] The HRSA Primary Care Residency Expansion provided funding to programs to add residency positions dedicated to primary care training.

Use of HRSA Primary Care Residency Expansion funds allowed us to develop a residency curriculum that has successfully retained graduates in pediatric primary care for more than 10 years after its inception. Our program has several features that help support residents interested in a career in primary care. First, trainees receive longitudinal mentorship from a consistent group of core faculty. Longitudinal relationships with preceptors have been associated with increased resident satisfaction with clinic experiences.[10] Second, the program allows several months per year of dedicated clinic time in addition to a weekly continuity clinic. Increased cumulative exposure to outpatient care has been associated with improved primary care knowledge[11] and improved continuity of care for patients,[7] which in turn is associated with resident satisfaction.[10,12] Lack of such familiarity with the outpatient setting and lack of continuity with patients are both cited by residents as sources of negative perceptions of careers in primary care.[13] Third, collaboration with Cone Health, a community partner, allows immersion in clinical settings more typical of nonacademic general practice. Fourth, a "transition month" in the final year of residency reinforces skills important for full-scope primary care practice. Finally, a longitudinal didactic series focused on primary care supplemented existing daily conferences provided in the categorical residency track.

The UNC primary care residency has enrolled a group of residents whose demographics more closely align with North Carolina's general population[14] compared to our categorical residency or to physicians nationally.[15] Several studies have shown that, on average, UIM students are more likely to express interest in primary care and in working with underserved populations.[16,17] Our primary care residents' have continuity clinic in an urban safety net clinic serving an ethnically diverse and economically marginalized population. This exposure, combined with existing diversity, equity, and inclusion efforts at UNC, may have helped recruit a more diverse complement of residents. However, we note that increasing diversity among pediatric trainees, and the relationship between issues such as faculty diversity, educational debt, admissions procedures and mentorship, is a complex issue beyond the scope of this paper.[18-21]

Our study has several limitations. First, although we have shown that graduates of our dedicated primary care residency program are more likely to enter the primary care workforce, we have not specifically assessed their preparedness for these careers. Second, we have not compared the expressed career plans of matriculating residents with their eventual job choice at graduation. Third, we have studied only graduates' first job placement, and not retention in the workforce over the longer term. Finally, we do not have data from matriculating residents on reasons for choosing the primary care residency. All of these limitations represent potential avenues for future work. Especially relevant to our overarching goal of training primary care pediatricians, would be a survey at 5 to 10 years post-graduation to determine how many graduates have remained in the primary care workforce. Also of interest is whether graduates are more likely than their peers to practice in settings that serve a high proportion of underserved patients.

Conclusions

The Primary Care Residency at UNC was launched via the HRSA Primary Care Residency Expansion grant (2011-2016) and continues to train residents 12 years later, supported by institutional funds. Graduates are more likely to be employed in primary care than peers in the categorical residency, and are more likely to come from demographic groups historically underrepresented in medicine.

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