

Training Family Physicians in Community Health Centers: A Health Workforce Solution

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Purpose: For more than 25 years, family medicine residencies (FMRs) have worked with community health centers (CHCs) to train family physicians. Despite the long history of this affiliation, little research has been done to understand the effects of training residents in this underserved community setting. This study compares CHC and non-CHC-trained family physicians regarding practice location, job and training satisfaction, and recruitment and retention to underserved areas. **Methods:** We conducted a cross-sectional survey of a cohort of the 838 graduates from the WAMI (Washington, Alaska, Montana, and Idaho) Family Medicine Residency Network from 1986–2002. **Results:** CHC-trained family physicians were almost twice as likely to work in underserved settings than their non-CHC-trained counterparts (64% versus 37%). When controlling for gender, percent full-time equivalent, and years from graduation, CHC-trained family physicians were 2.7 times more likely to work in underserved settings than non-CHC-trained family physicians. CHC and non-CHC-trained family physicians report similar job and training satisfaction and scope of practice. **Conclusions:** Training family physicians in CHCs meets the health workforce needs of the underserved, enhances the recruitment of family physicians to CHCs, and prepares family physicians similarly to their non-CHC trained counterparts.

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Community health centers (CHCs) are federally funded primary care clinics that provide care for underinsured and uninsured patients. They are the largest network of clinics providing service to the underserved and now care for more than 17 million US citizens in more than 6,000 service delivery sites in every state and territory.¹ Under the Federal Health Center Growth Initiative of 2002, and supported by \$2.2 billion in annual federal funds, this network is rapidly expanding.²⁻⁴ This initiative has increased services by 800 new and expanded health centers and brought services to 4 million new patients.⁵

As a result of the expansion of CHCs, there has been a significant increase in the demand for family physicians to staff them.² Primary care physicians constitute 90% of physicians working in the CHCs, the majority of whom are family physicians.⁶ The Health Resources and Services Administration (HRSA) predicts there will be an increase in demand for more than 11,000 additional clinicians by 2006.³ A recent national survey of

890 CHCs revealed significant shortages of providers.⁶ The most pronounced shortage was for family physicians. CHCs reported more than 400 family physician vacancies, and 40% of these vacancies had been open for more than 7 months.

An innovative collaboration between CHCs and family medicine residencies (FMRs) may provide an opportunity to meet the health workforce needs of CHCs.⁷⁻¹¹ Since the 1980s, some family medicine graduates have been trained in CHCs with the hope that these residents will be better prepared and more likely to meet the health workforce demands of CHCs and their patients. Training in CHCs is considered to enhance the development of the skills necessary to optimally care for the unique underserved populations served by these clinics.^{11,12}

Descriptions of CHC-FMR affiliations and small case series suggest a high percentage of family medicine residents trained in the CHC setting go on to work in CHCs.^{7,8,12-17} Hill et al reported that eight of their nine graduates from CHC-based training worked in CHCs following graduation.⁷ Tallia et al describe a 24% increase in the number of graduating family physicians working in underserved communities following the implementation of longitudinal community-based

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educational opportunities.¹⁸ While these studies suggest that health workforce issues of CHCs are addressed by CHC-based training, the small size and narrow scope of these studies limit meaningful conclusions.

This study is the first comparative analysis of the practice location, job and training satisfaction, and practice characteristics of CHC and non-CHC-trained family physicians. It describes the relationship between training in CHCs and subsequent employment in underserved areas.

Methods

Data Collection

We conducted two cross-sectional surveys of Washington, Alaska, Montana, and Idaho (WAMI) family medicine residency graduates. Two cohorts of family medicine graduates were surveyed about their current practice patterns, practice location, and their residency training. The first cohort of 983 family physicians who completed residency between 1986–1999 was surveyed in 2000, and the second cohort of 329 family physicians who completed residency between 2000–2002 was surveyed in 2003. Details of the survey methodology have been previously described.¹⁹ The University of Washington Human Subjects Review Board approved this study.

The results of the two surveys were combined to create one data set. CHC training status was defined as graduates who spent at least 1 year in a residency whose primary continuity clinic was located in a CHC. The residency directors of each of the 17 WAMI family medicine residencies were contacted by phone to clarify the years and location of CHC continuity clinic affiliations. Six family medicine residencies (four urban and two rural) were identified as providing CHC training. Each of the six residencies provided primary continuity clinic training in a CHC for all 3 years of trainees. The four urban sites were satellite 2-2-2 residencies that were part of a larger residency. The two rural residencies were 8-8-8 and 10-10-10 stand-alone residencies in which the continuity clinic was located in an existing CHC.

These data were cross-referenced with the name of the family medicine residency and graduation year of respondents to identify the CHC and non-CHC training cohorts. CHC and non-CHC-trained graduates were compared regarding practice location, practice satisfaction, spectrum of practice, and residency training. Graduates who were not board certified in family medicine or who worked less than 50% time were excluded.

Respondents described their location of practice in seven different underserved categories in which they work >50% full-time equivalent (FTE): (1) health profession shortage area (HPSA), (2) medically underserved area (MUA), (3) migrant health clinic (MHC), (4) community health center (CHC), (5) rural health

clinic (RHC), (6) National Health Service Corps commitment (NHSC), and (7) Indian Health Service (IHS). Respondents were asked to indicate all categories that applied. Respondents who indicated more than one underserved clinic type were counted once in the aggregate variable “working underserved.” CHC and non-CHC-trained physicians were compared for their differences in “working underserved” and separately for each of the seven underserved areas.

Respondents were also asked about practice satisfaction, spectrum of practice, and residency training. They used a 5-point Likert scale (1=unsatisfied, 5=highly satisfied) to rank their satisfaction on five separate variables: (1) location, (2) partners, (3) employers, (4) hours, and (5) income. Study participants described their spectrum of practice in the following categories: (1) obstetrics, (2) pediatric ambulatory care, (3) pediatric hospital care, (4) adult ambulatory care, (5) adult hospital care, and (6) procedures. They also ranked their preparation during residency training on a 3-point Likert scale (1=underprepared, 2=adequately prepared, 3=well prepared) for the same six practice characteristics.

Data Analysis

We performed bivariate analysis of demographics, practice satisfaction, spectrum of practice, and residency training comparing CHC-trained and non-CHC-trained family physicians. Categorical and continuous variables were evaluated using chi-square and independent two-sample *t* test analyses, respectively. Multivariate logistic regression was used to evaluate factors associated with practice in underserved areas, controlling for the effects of age, gender, FTE, and years from graduation. We performed a sensitivity analysis to account for respondents' possible misclassification of underserved clinic type. A subset of the underserved clinic types (CHC, MHC, NHSC, and IHS) that was less likely to be misclassified was evaluated, and a low likelihood of classification error was found. All analyses were performed using SPSS (Statistical Package for Social Sciences) version 12.0 for Windows.

Results

We received completed questionnaires from 919 graduates (69% [678/983] from the 2000 survey and 73% [241/329] from the 2003 survey). Applying exclusion criteria removed 81 graduates from analysis. Of graduates, 8.6% (72/838) were CHC trained. There was no information on nonrespondents.

The demographic characteristics of CHC- and non-CHC-trained family physicians, shown in Table 1, do not differ in gender or percent working full time. The CHC-trained cohort was younger closer to the time of graduation at the time of the survey as inferred from mean year of graduation and mean years from graduation. The differences in mean year of graduation and

mean years from graduation were statistically significant using two-sample *t* test comparisons. CHC- and non-CHC-trained graduates were both working near full time.

Table 1

Characteristics of CHC- and Non-CHC-trained Family Physicians

Variable	CHC-trained Physicians n=72	Non-CHC-trained Physicians n=766	P Value*
Gender			.262**
Male % (#)	45.8 (33)	54.7 (344)	
Female % (#)	54.2 (39)	45.3 (416)	
Average year of graduation	1998	1996	<.001***
Years from graduation # (range)	2.9 (13)	5.1 (13)	<.001***
FTE mean	89.9	89.4	0.84

CHC—community health center
FTE—full-time equivalent

* *P* value of difference between CHC- and non-CHC trained physicians
** Chi-square test
*** Two-sample *t* test

Table 2

Association Between CHC Training and Working in an Underserved Area

Underserved Types	CHC-trained Physicians* (%)	Non CHC-trained Physicians (%)	Bivariate Association P Value**	Multivariate Association OR (95%CI)***
Working underserved****	63.9	37.3	<.001	2.7 (1.6, 4.7)
Community health centers	28.3	7	.001	3.4 (1.6, 6.7)
Indian Health Service	9.7	3.8	.018	2.5 (.9, 5.9)
Medically underserved area	20.8	9	.001	2.4 (1.2, 4.5)
Migrant health clinic	8.3	3.3	.029	2.4 (.93, 6.3)
Rural health clinic	18.1	6.4	<.001	2.4 (1.2, 5)
Health profession shortage area	6.9	7.8	.79	.9 (.36, 2.5)
National Health Service Corps commitment	4.2	3.9	.92	.81 (.23, 2.8)

CHC—community health center

* The data in the CHC and non-CHC-trained physicians represent the percent of physician working in each of the underserved categories.
** *P* value calculated using chi-square analysis
*** OR=odds ratio and 95% confidence intervals from multivariate logistic regression controlling for gender, FTE, and year from graduation.
**** Working underserved indicates physicians working in at least one of the seven categories of underserved clinics at least 50% time.

Underserved Practice

Approximately two thirds of CHC-trained physicians reported working in at least one of the seven underserved clinic types. This was nearly twice the rate compared with non-CHC-trained physicians. Bivariate analysis of the individual underserved clinic types indicates that CHC-trained physicians reported working in underserved locations at two to four times the rate of their non-CHC-trained counterparts (Table 2). This effect was strongest for location in a CHC; CHC-trained physicians were four times more likely to work in a CHC than their non-CHC-trained counterparts.

The multivariate analysis demonstrated that the association between training in a CHC-based family medicine residency program and employment in an underserved clinic type remains strong after controlling for confounders (Table 2). When controlling for gender, percent FTE, and years from graduation, CHC-trained family physicians were 2.7 times more likely to work in underserved settings than non-CHC-trained family physicians. Similarly, CHC-trained graduates were 2.4–3.4 times (*P*<.05) as likely as their training counterparts to work in CHCs, MUAs, and RHCs. The largest effect was in CHCs. There were no statistically significant associations found between CHC training and work in HPSAs, NHSC, MHCs, or IHS clinics.

Practice Satisfaction, Spectrum of Practice, and Residency Training

There were few statistically significant differences between CHC- and non-CHC-trained family physicians in regard to their practice satisfaction, spectrum of practice, or residency training. Overall, practice satisfaction scores were similar and relatively high for both cohorts. The percent of graduates practicing broad-spectrum family medicine was high, and there were no statistically significant differences between CHC- and non-CHC-trained family physicians with the exception of pediatric hospital care. CHC- and non-CHC-trained family physicians ranked their residency preparation in each of the six practice characteristics similarly, with the exception of procedural training. Both cohorts reported being well prepared during residency (Table 3).

Discussion

Despite 2 decades of experience with training family physicians in CHCs, there has been little evaluation of the graduates from these programs. This study reports the experience of the largest cohort of CHC-trained graduates studied to date and presents the first comparison of CHC and non-CHC-trained physicians regarding employment in underserved clinic types, practice satisfaction, scope of practice, and residency training. The results suggest that training family physicians in CHCs meets the health workforce needs of the underserved and prepares family physicians similarly to their non-CHC-trained counterparts.

CHC-trained family physicians were more likely to work in underserved areas and clinic types. Indeed, graduates from programs affiliated with CHCs were two to four times more likely to work in those communities and clinics that serve a higher percentage of the underserved population. Given the challenge of and limited success with recruitment and retention of

physicians to underserved areas,²⁰⁻²⁶ the recruitment of physicians trained in CHCs to such areas is of vital importance.^{2,4,6} We conclude that the CHC-trained graduates successfully address the challenging issue of recruitment of physicians to underserved clinic types.

CHC residency training compares favorably to traditional non-CHC family medicine training. Residents trained in CHCs had high practice satisfaction ratings, had a broad scope of practice, and felt they were well prepared in their residency training. There were few differences between CHC- and non-CHC-trained family physicians in regard to practice satisfaction, scope of practice, and residency training.

We believe that the high rate of employment of CHC-trained graduates in underserved areas and clinic types is a result of providing a supportive training environment for medical school graduates who have demonstrated an interest in serving the underserved. Previous work has demonstrated that only longitudinal,

comprehensive programs to train students or residents for care of the underserved are successful in influencing career choice.^{20,27-32} Many clinical competencies needed by family physicians, such as community-focused care, coordinated care in a team approach, care for a racially and ethnically diverse population, and development of language skills, are ideally suited for integration into training at CHCs.⁹ We believe that the cohort of medical school graduates that maintain not only their interest in primary care, but a passion for serving the underserved during medical school, seek out educational opportunities that support their interests. For this cohort of students, CHC training offers just such an opportunity. CHC training provides an opportunity to receive residency education working with an underserved population in a community-based clinic with mentors of similar interest.

Despite an anticipated selection bias for employment in underserved areas, the overall percent of CHC-trained graduates choosing work in an underserved setting remains impressive. More than two thirds of CHC-trained graduates reported working in underserved settings following graduation. This is near double the rate of non-CHC-trained graduates and two to three times that of other underserved training programs.^{10, 20, 33-35} Despite training with a population challenged by economic, racial/ethnic, and linguistic barriers in a clinic setting challenged by limited funding, graduates of CHC-affiliated residencies overwhelmingly choose to work in similar settings following graduation. We conclude that CHC-trained graduates receive training that supports their

Table 3

Provider Satisfaction, Spectrum of Practice, and Residency Training

	CHC-trained Physicians	Non CHC-trained Physicians	P Value**
Provider satisfaction*			
Location	4.5	4.4	.45
Partners	4.4	4.4	.57
Employers	3.8	3.9	.30
Hours	4.1	3.9	.22
Income	3.8	3.9	.53
Spectrum of practice***			
Obstetrics	69	70.3	.88
Pediatric ambulatory care	98.5	98.9	.57
Pediatric hospital care	66.7	81.3	.024
Adult ambulatory care	88.7	91.3	.64
Adult hospital care	77.3	83.9	.21
Procedures	19.3	25.3	.24
Residency training****			
Obstetrics	2.73	2.75	.85
Pediatric ambulatory care	2.72	2.71	.88
Pediatric hospital care	2.48	2.56	.32
Adult ambulatory care	2.52	2.52	.90
Adult hospital care	2.7	2.72	.74
Procedures	1.42	1.64	.001

* Satisfaction was rated on a 1-5 scale (1=unsatisfied, 5=highly satisfied)

** Two-sample independent *t* test and chi-square statistics used to calculate *P* values of continuous and categorical variables respectively.

*** Spectrum of practice was calculated from 16 practice characteristics and reported as percent of graduates practicing within each training cohort.

**** Residency training was rated on a 1-3 scale (1=underprepared, 3=well prepared) for each practice characteristic.

interests and provides mentorship that encourages them to continue to pursue their professional aspirations to provide primary care to underserved populations.

Loan repayment programs, such as that of the NHSC, play a large role in recruitment of physicians to HPSAs.^{20,28,36,37} It would be expected that this might influence the rate of recruitment to underserved areas in this study. However, both the bivariate and multivariate analyses demonstrate that neither NHSC nor HPSA designations were associated with increased recruitment to underserved areas for this cohort of residents. This finding shows that the NHSC scholars distributed equally to CHC- and non-CHC-affiliated training sites and did not influence the findings related to practice location in an underserved setting.

CHCs are facing a health workforce crisis. Current family medicine training programs are unlikely to meet these increasing workforce demands.³⁸⁻⁴² Filling the existing CHC family physicians vacancies would absorb 20% of the 2005 output from family medicine residencies.⁶ Our results suggest that training family physicians in CHCs offers a possible health workforce solution to the recruitment problems for these clinic types. Among the seven underserved clinic types, CHCs had the largest overall percent of CHC-trained graduates, and CHC-trained graduates were four times more likely to work in CHCs. It appears that exposure to CHCs during residency training results in a large recruitment advantage for CHCs.

Limitations

While this is the largest study to date of its kind, it is important to understand its limitations. Cross-sectional data limit drawing causal associations between the variables studied. Similarly, with survey data there is the potential for recall bias, especially as it relates to the rating of training experience. Further, there is the potential that individuals inaccurately classified underserved areas based on lack of information regarding the specific definition of each category. Significant effort was made to avoid such a selection error, and sensitivity analysis suggests that this was not a problem.

Regional variation could limit the applicability of these findings. However, CHC-affiliated residencies were located in Alaska, Montana, and Washington and located in programs with rural and urban foci.

Selection bias is a component of the results. Residents rank their training sites based on their anticipated professional interests, so it would be expected that those that match in underserved training sites would be more likely to locate in an underserved location following graduation. That said, the overall percent and difference in odds ratios for the underserved settings, individually and in aggregate, is important information when evaluating the relative success of recruitment to underserved settings.

Conclusions

In light of the continued increase in the numbers of uninsured and the anticipated doubling in physician workforce needs in CHCs, our results suggest that one strategy to augment the provision of health providers to underserved areas comes from those residency programs based in CHCs. More research is needed to better understand this relationship. There are no data to identify either the number of family medicine residencies affiliated with CHCs nor the number of residents training with them. Further, there has been little evaluation of the characterization of the different types of affiliation between FMRs and CHCs.

The success of CHC-FMR affiliation on employment of family physicians in underserved clinic types, as described in this study, argues for further collaboration between educational institutions, government, and community-based programs. Innovative programs, like those evaluated in this study, combine community-based training, mission-driven patient care, and enhanced governmental reimbursement strategies to better train family physicians to serve the needs of the underserved.

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