



HIV Care by Early-Career Family Physicians

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BACKGROUND AND OBJECTIVES: Antiretroviral treatment has transformed human immunodeficiency virus (HIV) infection into a chronic disease. Prior research demonstrated a discrepancy between preparation to provide HIV care and current provision among recent residency graduates. Our study aimed to describe characteristics related to preparedness and provision of HIV care, and to identify the associations between physician and practice characteristics with current provision of HIV care among those prepared.

METHODS: We obtained data from the 2016 through 2019 American Board of Family Medicine (ABFM) National Family Medicine Graduate Survey. Our main outcome was self-reported provision of HIV care. Bivariate statistics compared differences in personal and practice characteristics with self-reported preparation for HIV care, then among those prepared, provision of HIV care. We used logistic regression to determine associations between HIV care, among those prepared, with practice and personal characteristics.

RESULTS: The response rate was 68.7% and our final sample size was 6,740 respondents. Only 25% of respondents reported preparedness in residency, and 44% of them reported current provision. Among those prepared, female gender (OR=0.604; 95% CI, 0.494-0.739) was associated with lower odds of practicing HIV care. Those working in high HIV prevalence areas (OR=1.718; 95% CI, 1.259-2.344) and in Northeast census region (OR=1.557; 95% CI, 1.137-2.132) had higher odds of providing HIV care.

CONCLUSIONS: Fewer than half of those prepared in residency reported currently providing HIV care. Working in a high HIV prevalence area was associated with higher odds of providing HIV care, which suggests early-career family physicians are responding to community needs.

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In the United States, at the end of 2018, an estimated 1,173,900 persons aged 13 years or more were living with human immunodeficiency virus (HIV) infection, including 161,800 who were undiagnosed.¹ There were 37,968 new HIV diagnoses in 2018.¹ Retention in HIV care plays a critical role in achieving good clinical outcomes and higher satisfaction with care,²

but only 57.9% of persons diagnosed with HIV received continuous HIV medical care in 2018.³ Antiretroviral treatment (ART) has transformed HIV infection into a chronic disease⁴ and with higher prevalence rates, its management has been moving from subspecialty care into the domain of primary care.⁵ In fact, patients prefer integration of HIV and primary care but HIV specialists are almost

exclusively in urban areas^{6,7} and feel less comfortable managing common comorbid conditions,^{7,8} thus increasing the need to manage HIV patients in primary care. In addition, HIV quality of care, such as appropriate ART use and antimicrobial prophylaxis, is similar between generalists and HIV specialists.⁹

Family medicine residencies are central for increasing the number of family physicians (FPs) who will practice HIV care after graduation.¹⁰ However, a national survey of program directors (PDs) showed that teaching HIV care was a high priority for only 20%, and less than 1% expected their graduates to feel prepared to provide comprehensive HIV care including ART.¹⁰ A 2016 survey of 2013 residency graduates found that nearly 30% reported being prepared to provide HIV care but less than 20% reported current provision of HIV care.¹¹ Strengthening HIV curricula in residency training, along with closing the gap between the preparedness and the current provision of HIV care, is an urgent task.

Past work using Part D Medicare claims found that FPs prescribing ART are more likely to be

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male, MDs, international medical graduates (IMG), practice in Northeast region and urban settings, and have been in practice for more than 10 years.⁵ A fuller assessment of practice and personal characteristics associated with FPs practicing HIV care is needed to further identify barriers and enabling features. There is a substantial gap between preparation for practice and management of HIV/AIDS,¹¹ but the impact of residency preparation on actual practice is unknown. Our study aimed to describe preparedness to provide HIV care and current provision of HIV care by early-career FPs, and to identify associations between individual and practice characteristics with current provision among those prepared.

Methods

We used data from the 2016 through 2019 American Board of Family Medicine (ABFM) National Graduate Survey. The graduate survey is administered to ABFM-certified FPs 3 years after residency graduation and is conducted to provide programmatic feedback to residency programs on the outcomes of training.¹² The survey asks a broad range of questions on current practice structure, organization, location, scope of practice, and preparedness for specific areas of practice from residency training.

To build our sample, we only included FPs who primarily provided outpatient continuity care. This excluded hospitalists, those primarily in emergency rooms, or noncontinuity outpatient settings. We also excluded physicians residing outside the United States (to allow for geocoding). Standard demographics (age, gender, degree type, medical school location) were obtained from ABFM administrative data. We obtained county-level data on 2018 HIV prevalence, derived from Centers for Disease Control and Prevention data, from the AIDSvu website.¹³

Our main outcome was self-reported delivery of HIV care from a question asking whether the respondent

personally provided, and separately was adequately prepared in residency to provide, pharmacologic management of HIV/AIDS. We used self-reported preparation for HIV care from residency training to limit the main analysis to only those who reported preparation. We categorized age as older (≥ 40 years) and younger. We categorized practice size as solo, small (2-5), medium (6-20), and large (≥ 20). We recoded practice organization to include low prevalence practice settings into the "other" category. We geocoded practice location, and assigned urban / rural status using the county-based Rural Urban Continuum Codes, with a code of 4 or higher being rural. We included census region to assess for prior findings of higher prescribing of ART by FPs in the Northeast. We categorized county-level HIV prevalence as low (0-149 cases per 100,000 population), medium (150-299 cases per 100,000), and high (>300 cases per 100,000).

First, we compared the numbers and characteristics of those prepared and not prepared to provide HIV care. Then we used descriptive statistics to characterize our main analytic sample and then conducted bivariate analyses, using *t* tests and χ^2 tests, of differences by practicing HIV care among those who were prepared. We then conducted an adjusted analysis using logistic regression including all variables to assess for independent associations with providing HIV care among those who were prepared. We conducted all analyses using SAS V9.4 (SAS Corp Cary, NC). The American Academy of Family Physicians Institutional Review Board approved this study.

Results

In this study, 8,994 of 13,101 eligible FPs (68.7% response rate) completed the graduate survey. After limiting to US-based respondents in continuity care and those with complete data, our final sample size was 6,740.

We divided respondents into four categories: prepared and practicing, prepared but not practicing, not prepared but practicing, and not prepared and not practicing (Table 1). Of respondents, 25.0% (n=1,683) reported being adequately trained in residency to provide pharmacological management of HIV, and 16.0% (n=1,075) reported providing the care in their current practice. Of those who reported the current provision, 68.7% (n=738) reported being prepared in residency (Table 1); 44% of those prepared reported current provision, whereas only 7% of those unprepared reported current provision (Table 1).

In bivariate analyses, early-career FPs who reported being prepared to provide HIV care, were more likely to be older (≥ 40 years of age), male, MDs, and IMGs (Table 2). Among those who reported preparation, respondents reporting current provision of HIV care were significantly less likely to be female (44.1% vs 54.1%; $P < .001$; Table 3). Practice in high HIV prevalence areas was significantly associated with providing HIV care, as was practice in the Northeast census region. Age, degree type, location of training, practice organization, practice size, and rurality were not associated with HIV practice.

In adjusted regression analyses controlling for physician, practice, and contextual characteristics,

Table 1: Total Number of Early-Career Family Physicians Reporting Preparedness and Current Provision of HIV Care

		Practicing HIV Care n (%)		Total
		Yes	No	
Prepared for HIV Care	Yes	738 (11.0)	945 (14.0)	1,683 (25.0)
	No	337 (5.0)	4,720 (70.0)	5,057 (75.0)
Total		1,075 (16.0)	5,665 (84.0)	6,740

Table 2: Characteristics of Early-Career Family Physicians by Self-reported Preparedness to Provide HIV Care

	Prepared, n (%)	Not Prepared, n (%)	P Value*
Total	1,683	5,057	
Physician Characteristics			
Age (in Years)			
<40	1,407 (83.6)	4,553 (90.0)	<.001
>40	276 (16.4)	504 (10.0)	
Gender			
Male	844 (50.1)	1,922 (38.0)	<.001
Female	839 (49.9)	3,135 (62.0)	
Degree Type			
MD	1,430 (85.0)	4,041 (79.9)	<.001
DO	253 (15.0)	1,016 (20.1)	
Location of Medical Training			
United States	1,023 (60.8)	3,761 (74.4)	<.001
International medical graduate	660 (39.2)	1,296 (25.6)	

*P value from χ^2 tests.

female gender remained associated with lower odds of practicing HIV care (OR=0.604; 95% CI, 0.494-0.739; Table 4). At the practice level, only independently-owned status was significantly associated with HIV care (OR=0.664; 95% CI, 0.457-0.963). Respondents who work in counties with the highest HIV prevalence had higher odds of providing HIV care (OR=1.718; 95% CI, 1.259-2.344). In addition, those who practice in Northeast census region had higher odds of providing HIV care (OR=1.557; 95% CI, 1.137-2.132).

Discussion

In this large national study of recent family medicine graduates, we found that fewer than half of those who were prepared in residency to provide HIV care were doing so in practice. This discrepancy is a significant loss for both residency programs and patients. Working in a lower HIV prevalence area was associated with lower provision of HIV care despite preparedness in residency. This may indicate graduates are appropriately tailoring their practice to meet community needs.

Our study reaffirmed the past work that found FPs practicing in the Northeast region had higher odds of prescribing ART.⁵ In addition, our findings showed that FPs working in areas with high HIV prevalence are at higher odds of providing HIV care, however, these findings do not fit with the distribution of HIV prevalence data from the 2020 HIV Surveillance Report.¹⁴ For instance, Northeast states were not highest-prevalence states, while Georgia, Florida, and Louisiana had higher prevalence. County-level prevalence can be more important than state-level when considering the association between the disease prevalence and provision of HIV care.

We found evidence that early-career FPs who were prepared to provide HIV care in residency were responding to community need when practicing in a high-prevalence area. This supports Barbara Starfield's idea that comprehensive primary care will look different depending on the population served. Starfield suggested that conditions in the population more frequent than 1 to 2 per 1,000 could be managed in primary care.¹⁵ Our finding that early-career

FPs in a county with a prevalence of more than 300 per 100,000 (or 3 per 1,000) exactly fits that definition.

Only one-fourth of early-career FPs reported adequate preparation in residency to provide pharmacological management of HIV, and even fewer early-career FPs provide HIV care in the current practice. Nearly two-thirds of those providing HIV care were prepared in residency. These findings support the significant impact of residency's curriculum on graduates' future practice. Although only 20% of PDs reported that teaching about HIV care is a high priority,¹⁰ family medicine residency programs should augment HIV curriculum to meet the need of the growing HIV-infected populations, especially in high HIV prevalence areas.

There are several limitations to our work. First, this cross-sectional study design can only show associations instead of causation. Second, the term "pharmacological care of HIV/AIDS" may have been variably interpreted between early-career FPs and PDs. One-fourth of early-career physicians reported that their residency prepared them for pharmacological treatment of HIV/AIDS, whereas less than 1% of PDs in family medicine expected graduates to feel prepared to provide comprehensive HIV care including ART.¹⁰ In the graduate survey, respondents might have interpreted the subjective term "adequate" for the training to prepare for HIV practice. Third, recall bias may exist since respondents self-assessed their preparedness in residency 3 years after the graduation. Lastly, early-career FPs may not be representative of all FPs providing HIV care given the positive correlation between years in practice and current provision of HIV care seen in prior studies.

Only one-sixth of early-career FPs are currently providing HIV care. Working in a high HIV prevalence area was associated with higher odds of providing HIV care, which suggests early-career family physicians are responding to community needs.

Table 3: Personal and Practice Characteristics of Early-Career Family Physicians Who Self-reported Preparedness to Provide HIV Care, by Provision of HIV Care

	Prepared and Practicing, n (%)	Prepared and Not Practicing, n (%)	P Value
Total	738	945	
Physician Characteristics			
Age (in Years)			
			.351
<40	624 (84.6)	783 (82.9)	
>40	114 (15.4)	162 (17.1)	
Gender			
			<.001
Male	410 (55.6)	434 (45.9)	
Female	328 (44.4)	511 (54.1)	
Degree Type			
			.219
MD	636 (86.2)	794 (84.0)	
DO	102 (13.8)	151 (16.0)	
Location of Medical Training			
			.388
United States	440 (59.6)	583 (61.7)	
International medical graduate	298 (40.4)	362 (38.3)	
Practice/Contextual Characteristics			
Practice Organization			
			.074
Hospital-/health system-owned medical practice (not including managed care or HMO)	279 (37.8)	368 (38.9)	
Independently-owned medical practice	91 (12.3)	154 (16.3)	
Managed care/HMO practice	70 (9.5)	88 (9.3)	
Academic health center / faculty practice (residency or university teaching environment)	79 (10.7)	90 (9.5)	
Federally qualified health center or look-alike	106 (14.4)	100 (10.6)	
Other	113 (15.3)	145 (15.3)	
Practice Size			
			.985
Solo	26 (3.5)	35 (3.7)	
2-5 providers	277 (37.5)	350 (37.0)	
6-20 providers	258 (35.0)	337 (35.7)	
>20 providers	177 (24.0)	223 (23.6)	
HIV Prevalence			
			.001
Low (0-<150/100K)	149 (20.2)	252 (26.7)	
Medium (150-<300/100K)	232 (31.4)	312 (33.0)	
High (>300/100K)	357 (48.4)	381 (40.3)	
Urban/Rural			
			.277
Urban	629 (85.2)	787 (83.3)	
Rural	109 (14.8)	158 (16.7)	
Census Region			
			.008
Northeast	127 (17.2)	115 (12.2)	
Midwest	118 (16.0)	192 (20.3)	
South	290 (39.3)	366 (38.7)	
West	203 (27.5)	272 (28.8)	

Table 4: Adjusted Associations With Provision of HIV Care Among Early-Career Family Physicians Who Self-Reported Preparedness to Provide HIV Care

	Odds Ratio (95% CI)	P Value
Physician Characteristics		
Age (in Years)		
<40	Reference	
>40	0.817 (0.621-1.074)	.351
Gender		
Male	Reference	
Female	0.604 (0.494-0.739)	<.001
Degree Type		
MD	0.912 (0.678-1.227)	.219
DO	Reference	
Location of Medical Training		
United States	1.049 (0.840-1.312)	.388
International medical graduate	Reference	
Practice/Contextual Characteristics		
Practice Organization		
Hospital/health system-owned medical practice (not including managed care or HMO)	0.970 (0.718-1.309)	.841
Independently-owned medical practice	0.664 (0.457-0.963)	.031
Managed care/HMO practice	0.965 (0.631-1.474)	.868
Academic health center/faculty practice (residency or university teaching environment)	1.063 (0.702-1.611)	.772
Federally qualified health center or look-alike	1.320 (0.895-1.945)	.161
Other	Reference	
Practice Size		
Solo	1.101 (0.620-1.956)	.743
2-5 providers	1.087 (0.824-1.434)	.556
6-20 providers	1.034 (0.791-1.354)	.805
>20 providers	Reference	
HIV Prevalence		
Low (0-<150/100K)	Reference	
Medium (150-<300/100K)	1.263 (0.929-1.717)	.136
High (>300/100K)	1.718 (1.259-2.344)	<.001
Urban/Rural		
Urban	Reference	
Rural	1.135 (0.824-1.562)	.277
Census Region		
Northeast	1.557 (1.137-2.132)	.006
Midwest	0.873 (0.645-1.180)	.377
South	Reference	
West	1.022 (0.787-1.327)	.871

This information can help PDs tailor training for residents who know where they are going to practice to meet patient needs. Further studies to explore potential barriers to provide HIV care may be needed.

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