

Impact of AIDS Education and Training Centers on the US HIV Medical Workforce

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Objectives. To examine the extent to which the AIDS Education and Training Centers (AETCs) are increasing the number and racial/ethnic diversity of HIV medical providers, in accordance with the US National HIV/AIDS Strategy (NHAS).

Methods. We used administrative data from funding year 2012–2013 to describe AETC trainee characteristics, including the types of medical providers trained, compared with national estimates of available US medical providers to estimate the proportion of providers trained for every 1000 available providers by professional group and race/ethnicity.

Results. AETCs trained 56 127 unique trainees, of whom 64.1% were medical providers and 45.5% were racial/ethnic minorities. Compared to national proportions, participation in AETC training was higher among racial/ethnic minorities. The proportions of racial/ethnic minority groups trained differed across regional AETCs.

Conclusions. AETCs support NHAS goals by expanding the HIV medical workforce and strengthening the skills of minority medical providers to deliver high quality HIV care.

Public Health Implications. Some AETCs made greater contributions to training different types of racial/ethnic minorities, which indicates varied approaches are needed to best target these efforts in communities heavily impacted by HIV. (*Am J Public Health.* Published online ahead of print October 13, 2016: e1–e4. doi:10.2105/AJPH.2016.303451)

There is a shortage of medical providers able to care for people with HIV; this shortage is expected to worsen as many near retirement.¹ HIV programs are also experiencing difficulty recruiting HIV medical providers, particularly among racial/ethnic minorities.¹ African Americans, Latinos, and American Indian/Alaska Natives (AI/ANs) are underrepresented among available medical providers^{2–4} and among providers serving people living with HIV.¹ This shortage is highlighted as a key issue in the National HIV/AIDS Strategy, which calls for increasing the number and racial/ethnic diversity of available HIV medical providers.⁵ This shift may improve patient linkage to and retention in care because patients of race-concordant providers report receiving better interpersonal care, which results in greater medical comprehension, the acceptance of appropriate medical care, and a greater likelihood of keeping follow-up appointments.^{3,4,6} These findings are

significant because racial/ethnic minorities disproportionately care for minority communities, which are heavily affected by HIV and less optimally engaged across the HIV care continuum.⁷

Although HIV-serving racial/ethnic medical providers report lower knowledge of HIV care and treatment,⁸ education and training can prepare these medical providers to deliver high-quality HIV care.^{9–11} The national AIDS Education and Training Centers (AETC) program plays a crucial role in developing the HIV workforce through clinical training and capacity development in evidence-based HIV care practices. AETC efforts are associated with

increasing medical provider knowledge, improving skills, translating new clinical skills into practice, and increasing adherence to clinical practice guidelines.^{10,11}

We describe characteristics of AETC medical provider trainees and estimate the rates of training using national medical provider estimates to assess AETC contributions to increasing the racial/ethnic diversity of the HIV medical workforce.

METHODS

AETC trainees complete a standardized form, which collects demographic information (e.g., profession, race/ethnicity) from medical providers and other clinicians (e.g., psychologists) and asks HIV-serving medical providers additional questions (e.g., patient population demographics). We cleaned, de-duplicated, and linked data to an event information form; we dropped forms that could not be linked from analysis (3.2%). We used data from AETC didactic trainings, skills-building sessions, clinical preceptorships, clinical consultations, and technical assistance delivered in funding year 2012–2013 (July 1, 2012 to June 30, 2013) to provide descriptive information about trainees.

To compare training rates, we obtained national estimates of medical providers from the Area Health Resources Files (in May 2016), which derived data from the US Census Bureau's American Community Survey (ACS; in 2011–2013).¹² The ACS is a continuous nationwide self-report survey that includes data on the race/ethnicity of

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This brief was accepted August 21, 2016.

doi: 10.2105/AJPH.2016.303451

individuals working in health occupations. We combined ACS professional categories (e.g., registered nurse, licensed practical

nurse, and licensed vocational nurse; dental hygienist and dental assistant) to conform to AETC categories. We calculated the absolute

values and the AETC training participation rate by professional group and race/ethnicity; the rate represented the number of medical

TABLE 1—Estimated Number of Medical Providers Trained per 1000 Available Providers, by Self-Reported Professional Group and Race/Ethnicity: AETC, United States, 2012–2013

Characteristic	Unique AETC Medical Provider Trainees, No. (%)	Estimate of Licensed Providers in US, No. (%)	AETC Training Rate per 1000 Licensed Providers ^a
Total unique medical providers	32 915 ^b (100.0)	5 662 656 (100.0)	5.8
White, non-Latino	20 154 (61.2)	4 012 124 (70.9)	5.0
Latino	3 062 (9.3)	399 291 (7.1)	7.7
African American, non-Latino	4 225 (12.8)	573 396 (10.1)	7.4
Asian/Pacific Islander, non-Latino	3 551 (10.8)	564 767 (10.0)	6.3
AI/AN, non-Latino	451 (1.4)	19 180 ^c (0.3)	23.5 ^c
Multiracial, non-Latino	636 (1.9)	93 898 (1.7)	6.8
Total nurses (RN, LPN, and LVN)	14 119 (100.0)	3 711 844 (100.0)	3.8
White, non-Latino	8 692 (61.6)	2 663 272 (71.8)	3.3
Latino	1 189 (8.4)	227 272 (6.1)	5.2
African American, non-Latino	2 591 (18.4)	467 869 (12.6)	5.5
API, non-Latino	763 (5.4)	282 170 (7.6)	2.7
AI/AN, non-Latino	252 (1.8)	15 103 (0.4)	16.7
Multiracial, non-Latino	290 (2.1)	56 158 (1.5)	5.2
Total physicians	9 083 (100.0)	906 802 (100.0)	10.0
White, non-Latino	5 003 (55.1)	607 183 (67.0)	8.2
Latino	951 (10.5)	55 993 (6.2)	17.0
African American, non-Latino	823 (9.1)	47 024 (5.2)	17.5
API, non-Latino	1 764 (19.4)	176 703 (19.5)	10.0
AI/AN, non-Latino	61 (0.7)	1 363 (0.2)	44.8
Multiracial, non-Latino	185 (2.0)	18 536 (2.0)	10.0
Total pharmacists	3 879 (100.0)	280 083 (100.0)	13.8
White, non-Latino	2 709 (69.8)	195 710 (69.9)	13.8
Latino	215 (5.5)	11 221 (4.0)	19.2
African American, non-Latino	276 (7.1)	17 003 (6.1)	16.2
API, non-Latino	513 (13.2)	50 455 (18.0)	10.2
AI/AN, non-Latino	44 (1.1)	485 (0.2)	90.7
Multiracial, non-Latino	47 (1.2)	5 209 (1.9)	9.0
Total other dental (dental hygienist and dental assistant)	2 581 (100.0)	469 068 (100.0)	5.5
White, non-Latino	1 749 (67.8)	329 140 (70.2)	5.3
Latino	409 (15.8)	80 298 (17.1)	5.1
African American, non-Latino	177 (6.9)	26 159 (5.6)	6.8
API, non-Latino	94 (3.6)	22 596 (4.8)	4.2
AI/AN, non-Latino	62 (2.4)	2 229 ^d (0.5)	27.8
Multiracial, non-Latino	35 (1.4)	8 646 (1.8)	4.0
Total dentists	1 699 (100.0)	167 951 (100.0)	10.1
White, non-Latino	909 (53.5)	125 377 (74.7)	7.3
Latino	178 (10.5)	10 940 (6.5)	16.3
African American, non-Latino	216 (12.7)	5 364 (3.2)	40.3
API, non-Latino	313 (18.4)	23 899 (14.2)	13.1
AI/AN, non-Latino	10 (0.6)	NA	NA
Multiracial, non-Latino	39 (2.3)	2 371 (1.4)	16.4

Continued

TABLE 1—Continued

Characteristic	Unique AETC Medical Provider Trainees, No. (%)	Estimate of Licensed Providers in US, No. (%)	AETC Training Rate per 1000 Licensed Providers ^a
Total physician assistants	1 554 (100.0)	126 908 (100.0)	12.2
White, non-Latino	1 092 (70.3)	91 442 (72.1)	11.9
Latino	120 (7.7)	13 567 (10.7)	8.8
African American, non-Latino	142 (9.1)	9 977 (7.9)	14.2
API, non-Latino	104 (6.7)	8 944 (7.0)	11.6
AI/AN, non-Latino	22 (1.4)	NA	NA
Multiracial, non-Latino	40 (2.6)	2 978 (2.3)	13.4

Note. AETC = AIDS Education and Training Centers; AI/AN = American Indian/Alaska Native; API = Asian/Pacific Islander; LPN = licensed practical nurse; LVN = licensed vocational nurse; NA = areas where national estimates were not available and training rates were not calculated; RN = registered nurse.

^a $P < .001$ for all comparisons.

^bAETC professional group totals include those with unknown racial/ethnic identity.

^cAI/AN national estimates do not include dental hygienists, dentists, or physician assistants.

^dNumber of AI/AN dental assistants only.

providers trained per 1000 available medical providers in the United States. We performed χ^2 goodness-of-fit analysis to determine whether training participation in each professional group differed by race/ethnicity. We performed all analyses with SAS version 9.4 (SAS Institute, Cary, NC).

RESULTS

AETCs delivered 14 947 trainings to 56 127 unique trainees (total attendance count was 112 327), of whom 45.5% ($n = 25\,561$) identified as racial/ethnic minorities. Medical providers, including advanced practice nurses ($n = 3055$), accounted for 64.1% ($n = 35\,970$) of unique trainees, and 39.7% ($n = 14\,284$) served mostly ($\geq 50.0\%$) minority patient populations. Most training (93.4%) focused on a topic related to the National HIV/AIDS Strategy (e.g., antiretroviral therapy, targeted and vulnerable populations) with a mean of 3.1 (± 10.0) hours and 9.5 (± 23.3) trainees per event.

HIV-serving medical providers accounted for 36.7% ($n = 20\,610$) of all unique trainees, with 60.0% ($n = 12\,368$) identifying as White and 38.4% ($n = 7904$) as racial/ethnic minorities. New and novice HIV medical providers (with < 4 years of HIV experience) accounted for 33.2% ($n = 6849$) of HIV medical providers, with racial/ethnic minorities representing 43.5% ($n = 2976$) of new and novice HIV medical providers. Among

HIV medical providers, 44.7% ($n = 9207$) reported serving mostly minority ($\geq 50.0\%$) HIV patient populations, with 50.2% ($n = 3969$) of racial/ethnic minority HIV medical providers reporting serving mostly minority HIV patient populations. Additionally, 31.9% ($n = 6566$) of HIV medical providers cared for 20 or more people living with HIV per month compared with 34.7% ($n = 2741$) among racial/ethnic minority HIV medical providers.

We compared the number of AETC-trained medical providers ($n = 32\,915$) with the estimated number of medical providers available in the United States (Table 1; $n = 5\,662\,656$). We examined the following professions: nurses (AETC $n = 14\,119$; national $n = 3\,711\,844$), physicians (AETC $n = 9,083$; national $n = 906\,802$), pharmacists (AETC $n = 3879$; national $n = 280\,083$), other dental professionals (AETC $n = 2581$; national $n = 469\,068$), dentists (AETC $n = 1699$; national $n = 167\,951$), and physician assistants (AETC $n = 1554$; national $n = 126\,908$). The estimated proportion of medical providers reached by the AETC program was higher among racial/ethnic minority providers for all types of provider groups examined ($P < .001$ for all racial/ethnic groups). Regional AETC variation in the training of racial/ethnic minorities was different relative to the size of the AETC (i.e., number of states) and the racial/ethnic distribution in the states served (Table A, available as a supplement to the online version of this article at <http://www.ajph.org>).

The AETC training participation rate per 1000 was higher among African Americans across all 6 medical provider groups examined (40.3 dentists, 17.5 physicians, 16.2 pharmacists, 14.2 physician assistants, 6.8 dental professionals, and 5.5 nurses) than was that among their White counterparts. The AETC training rate was also consistently higher for AI/ANs (90.7 pharmacists, 44.8 physicians, 27.8 dental professionals, and 16.7 nurses), Latinos (19.2 pharmacists, 17.0 physicians, 16.3 dentists, and 5.2 nurses), and multiracial providers (16.4 dentists, 13.4 physician assistants, 10.0 physicians, and 5.2 nurses) than was that for Whites. Asian providers more frequently had lower training rates but had higher training rates among dentists (13.1) and physicians (10.0) than did their White counterparts.

DISCUSSION

Our findings indicate a lack of diversity among medical providers nationally, with AETCs reaching a large group of White and non-White medical providers and engaging them on topics pertinent to ending the HIV epidemic. We observed a higher rate of AETC training participation among medical providers who identified as African American and AI/AN across all types of provider groups examined, with variation by AETC region. These successes warrant

future research on the strategies employed to recruit and engage racial/ethnic minorities by AETCs with high minority training rates. Additional areas for future inquiry include the examination of minority training rates over time and exploring training rates among other clinicians (e.g., psychologists, social workers) who contribute heavily to the success of HIV health care teams.

Our analysis is limited because some trainees did not fully complete data forms and we excluded them from analysis. Also, ACS is not a perfect comparator because it estimates medical providers for all clinical specialties; national estimates of HIV medical providers do not exist. ACS did not provide estimates for advanced practice nurses, geographic areas with low populations (< 20 000), or AI/AN dentists, dental hygienists, or physician assistants.

PUBLIC HEALTH IMPLICATIONS

Implementation of the National HIV/AIDS Strategy and the Affordable Care Act are expected to result in increased access to and demand for primary care services and HIV medical care among vulnerable, diverse populations previously uninsured or out of care.^{5,7} This will require more medical providers who are able to provide culturally appropriate, high-quality HIV care. Our findings demonstrate that AETC workforce development efforts are effective at increasing the diversity of HIV medical providers. Some AETCs made disproportionately greater contributions to training racial/ethnic minority medical providers, which indicates that different approaches may be needed to target efforts in areas with high rates of HIV and large racial/ethnic minority concentrations. The development and implementation of these varying approaches underscore the importance of AETC funding for the sites in greatest need. **AJPH**

CONTRIBUTORS

K. Khamarko supervised the study and led the writing of the article. K. Khamarko, M.-S. Kang Dufour, and S. Bodach acquired, analyzed, and interpreted the data. All authors contributed to the conceptualization of the study and critically revised the article for important intellectual content.

ACKNOWLEDGMENTS

This project is supported by the Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services (HHS; grant UA2HA07855, AIDS Education and Training Centers [AETC] National Evaluation Center).

We would like to thank the HRSA and regional AETCs and their partners.

Note. This information and content and conclusions are those of the authors and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS, or the US government.

HUMAN PARTICIPANT PROTECTION

This study was approved (IRB 11-06078) by the University of California, San Francisco's Committee on Human Research.

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