

National Survey of United States Human Immunodeficiency Virus Medical Providers' Knowledge and Attitudes About the Affordable Care Act

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Background. The Affordable Care Act (ACA) affects United States' healthcare by offering Medicaid expansion and tax subsidies to persons with low incomes, and its interaction with the current human immunodeficiency virus (HIV) healthcare delivery system is complex. The objective was to explore HIV medical providers' knowledge and attitudes about the ACA.

Methods. HIV medical providers were emailed a weblink to a survey. Descriptive statistics, Mann-Whitney *U* tests, and binary logistic regression were performed.

Results. Of the 253 survey participants, the majority (61%) answered all 4 knowledge questions correctly. About 70% knew whether or not their state had decided to expand Medicaid. About 1 in 10 did not know if the ACA eliminated the Ryan White Program. When rating whether the ACA would improve their patients' HIV outcomes from 1–5 with 5 as “strongly agree,” the providers' mean responses varied by state Medicaid status: 3.78 (standard deviation [SD], 0.83) for Medicaid expansion compared with 3.37 (SD, 1.00) for Medicaid nonexpansion ($P = .002$). Adjusting for medical provider type, years of HIV practice, and sources of ACA information, correct ACA knowledge was associated with providing care in a Medicaid nonexpansion state (adjusted odds ratio [aOR], 2.07; 95% confidence interval [CI], 1.11–3.88), obtaining knowledge from case managers (aOR, 1.89; 95% CI, 1.03–3.48), and obtaining knowledge from newspapers/magazines (aOR, 1.94; 95% CI, .99–3.81).

Conclusions. Medical providers in Medicaid expansion states were more optimistic about the ACA's likelihood to improve their patients' HIV outcomes. There are gaps in HIV medical providers' understanding of the ACA. Education could enhance systems-based practice.

Keywords. HIV; Patient Protection and Affordable Care Act; healthcare reform; Medicaid; systems-based practice.

The Patient Protection and Affordable Care Act (ACA) is federal legislation that aims to provide affordable insurance coverage to people who were previously uninsured or underinsured. Before the ACA was implemented, there were many questions about how the ACA would affect persons living with human immunodeficiency virus (PLWH). Because PLWH are disproportionately represented among the uninsured, many hoped that they might benefit substantially from this federal legislation [1–5]. On the other hand, there were concerns about how the ACA would interact with the United States' current complex, comprehensive human immunodeficiency virus (HIV)

healthcare delivery system, such as Ryan White–funded clinics and AIDS Drug Assistance Programs (ADAPs), which are funded by the Ryan White Comprehensive AIDS Resources Emergency Act [6].

Since the full implementation of the ACA in 2014, HIV care delivery has changed in the United States. Approximately 55 000 PLWH have gained Medicaid through ACA Medicaid expansion, but many low-income PLWH were left without health insurance in Medicaid nonexpansion states [7]. State ADAPs are a safety net to ensure that underinsured and uninsured PLWH receive key medications, such as antiretroviral therapy, and many ADAPs incorporated the ACA into their healthcare delivery model by funding clients' ACA Qualified Health Plans (QHPs). In 2016, more than 124 000 PLWH received some funding from their state ADAP for QHP purchasing and continuation [8].

Given the complex nature of the ACA's interaction with HIV healthcare delivery, systems-based practice is essential for HIV medical providers. Additionally, with the possibility of more healthcare reform changes on the horizon, the importance of systems-based practice will only increase. The objective of this study was to explore HIV medical providers' knowledge and attitudes about the ACA across the nation.

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METHODS

HIV medical providers (fellow physicians, physician assistants, nurse practitioners, and attending physicians) who were affiliated with an Accreditation Council for Graduate Medical Education (ACGME)-accredited infectious diseases fellowship program were emailed a weblink to a survey either by our study team or by someone with a leadership position at their institution in infectious diseases or in their HIV clinic between December 2014 (Virginia) and September 2015 (all other states). The survey was in English. Responses were anonymous, and we did not collect identifying information. Participants had the opportunity to submit their email address at the end of the survey to enter a lottery drawing for a \$200 gift card. The study was approved by the Social and Behavioral Sciences Institutional Review Board at the University of Virginia.

Information collected about the participants included medical provider type, the state in which they provide HIV medical care, and the length of time that they have been providing medical care to people living with HIV.

The survey assessed sources of ACA information, knowledge about insurance subsidies, status of preexisting conditions, presence of Medicaid expansion, and the Ryan White Program, as well as attitudes about the ACA. Participants were asked to select their sources of ACA information and to specify their main source of ACA information from the following options: clinic patients, clinic case managers, clinic social workers, clinic support staff, other hospital staff, television, newspaper or magazine, websites, social networking sites, radio, mail, their health insurance company, and friends or family. For knowledge questions (see Figure 1 for questions), answer options were “yes,” “no,” or “I don’t know”. Participants were asked to agree or disagree with statements about the ACA to capture their attitudes toward the ACA (see Figure 2 for questions). Participants were asked to select from the following options on a Likert scale from 1 to 5: “strongly disagree,” “disagree,” “neutral or I don’t know,” “agree,” and “strongly agree.”

Statistics

Descriptive statistics were used for participant characteristics, all sources of ACA knowledge, main source of ACA knowledge, and the 4 ACA knowledge questions. For the questions about

attitude toward the ACA, a Mann-Whitney *U* test was used to assess whether the distribution of answers across the Likert scale differed between medical providers based on their state’s Medicaid expansion status.

To assess association of participant characteristics and sources of ACA knowledge with correct ACA knowledge, bivariable and multivariable logistic regression was performed. Correct ACA knowledge was defined as getting all 4 ACA knowledge questions correct. Variable considered for inclusion included participant characteristics, main source of ACA knowledge, and individual sources of knowledge reported. For each of these, bivariable logistic regression was performed to assess if they were associated with correct knowledge. For the individual sources of knowledge, they were assessed with a Kruskal-Wallis test to assess if reporting the source of knowledge was associated with a different distribution of the number of correct ACA knowledge questions. If the variable was statistically significant with one of these methods, it was included in the multivariable model. The χ^2 test was used to assess associations between an HIV medical provider’s state Medicaid expansion status and correct ACA knowledge on individual questions.

Odds ratios were calculated to measure the association. Statistical significance was measured using 95% confidence intervals (CIs) for each of the estimated odds ratios. All statistical analyses were conducted using IBM SPSS Statistics software, version 24.

RESULTS

Participant Characteristics

A total of 1203 HIV medical providers received the survey from our team ($n = 514$) or from a medical provider with a leadership position at their institution in infectious diseases or at their HIV clinic ($n = 689$). The response rate was 21%. Characteristics of the 253 survey participants are included in Table 1. The participants were from 35 states and the District of Columbia. There was an average of 7 participants per state. Fourteen states had no participants; they were split evenly between Medicaid expansion and nonexpansion status. No data was collected on those who did not answer the survey questions. Eight participants (3%) answered only demographic questions and questions about their sources of ACA knowledge. Given that this

1. Does the Affordable Care Act provide subsidies for people with low incomes to purchase health insurance?
2. Does the Affordable Care Act make it illegal to exclude a person from an insurance plan due to a preexisting condition?
3. Does the Affordable Care Act eliminate the Ryan White HIV/AIDS Program?
4. Did your state decide to move forward with the Affordable Care Act’s optional Medicaid expansion?

Figure 1. Survey questions about Affordable Care Act knowledge. Abbreviation: HIV, human immunodeficiency virus.

1. The Affordable Care Act will improve the United States' health outcomes.
2. The Affordable Care Act will improve my HIV patients' HIV outcomes.
3. The Affordable Care Act will improve my HIV patients' non-HIV outcomes.

Figure 2. Survey statements about Affordable Care Act attitudes. Abbreviation: HIV, human immunodeficiency virus.

resulted in <5% missing data, they were excluded from all other analyses.

Sources of ACA Information

In terms of all sources used for ACA information, 64% reported using websites, 63% reported using newspapers or magazines, 49% reported using television, 48% reported using clinic social workers, 45% reported using clinic case managers, and 35% reported using the radio. Medical providers reported that their main source of information was websites (32%), newspapers or magazines (23%), clinic case managers (12%), and clinic social workers (10%). Only 1% reported obtaining ACA information from their health insurance company. One provider wrote in that he read the ACA law as his main source of information. See [Figure 3](#) for all percentages of reported sources and main reported sources. Participants reported an average of 4.4 sources of information (standard deviation [SD], 2.2; range, 1–13).

Table 1. Characteristics of Respondents

Characteristic	No. (%)
No. of respondents	253
Type of medical provider	
Fellow physicians	34 (15.5)
Physician assistants	10 (4.6)
Nurse practitioners	27 (12.3)
Attending physicians	148 (67.6)
Length of time providing HIV care	
<5 y	75 (29.6)
>5 to 10 y	43 (17.0)
>10 to 15 y	27 (10.7)
>15 to 20 y	36 (14.2)
> 20 y	72 (28.5)
State of HIV practice ^a	
New York	45 (17.8)
Virginia	34 (13.4)
California	16 (6.3)
North Carolina	16 (6.3)
Massachusetts	15 (5.9)
Additional states and D.C.	127 (50.2)
Medicaid expansion status of state of HIV practice ^b	
Medicaid nonexpansion	101 (39.9)
Medicaid expansion	152 (60.1)

Abbreviations: D.C., District of Columbia; HIV, human immunodeficiency virus.

^aStates with >5% of respondents are shown individually. The District of Columbia was included in the study.

^bMedicaid status of state of HIV practice at time of survey distribution (December 2014 for Virginia; August 2015 for all other states).

ACA Knowledge

The majority of participants (61%) answered all 4 knowledge questions correctly. Approximately one-third of participants answered “I don’t know” to at least 1 question. Eighty-six percent knew that the ACA provides subsidies for people with low incomes to purchase health insurance. Ninety percent knew that the ACA makes it illegal to exclude a person from an insurance plan due to a preexisting condition. Ninety-one percent knew that the ACA does not eliminate the federal Ryan White Program. Seventy-three percent knew correctly whether or not their state had elected to expand Medicaid. Approximately 1 of 5 participants answered “I don’t know” about whether or not their state had expanded Medicaid.

ACA Attitudes

The mean response for “The ACA will improve the United States’ health outcomes” was 3.95 (SD, .95) (4.08 [SD, .82] for providers in Medicaid expansion states and 3.78 [SD, 1.09] for providers in Medicaid nonexpansion states). The mean response for “The Affordable Care Act will improve my HIV patients’ non-HIV outcomes” was 3.93 (SD, .90) (4.04 [SD, .80] for providers in Medicaid expansion states and 3.76 [SD, 1.01] for providers in Medicaid nonexpansion states). The distribution of responses across the Likert scale for these questions was similar between providers in Medicaid expansion and Medicaid nonexpansion states.

The mean response for “The Affordable Care Act will improve my HIV patients’ HIV outcomes” was 3.61 (SD, .92). For this statement, the distribution of responses was different between providers in Medicaid expansion states and Medicaid nonexpansion states ($P = .002$). Medical providers in Medicaid expansion states more strongly agreed that the ACA would improve their patients’ HIV outcomes (mean, 3.78 [SD, .83]) than providers in Medicaid nonexpansion states (mean, 3.37 [SD, 1.00]) ([Figure 4](#)).

Association of Participant Characteristics and Sources of Knowledge With Correct ACA Knowledge

[Table 2](#) presents unadjusted and adjusted odds ratios (aORs) for the association between correct ACA knowledge and participant characteristics and sources of ACA knowledge. Provider type and length of time providing HIV care were associated with correct ACA knowledge. Providers in Medicaid nonexpansion states were more likely to answer all 4 questions correctly in univariable and multivariable regression.

Participants in Medicaid expansion states were more likely to get all 4 questions correct than participants in Medicaid

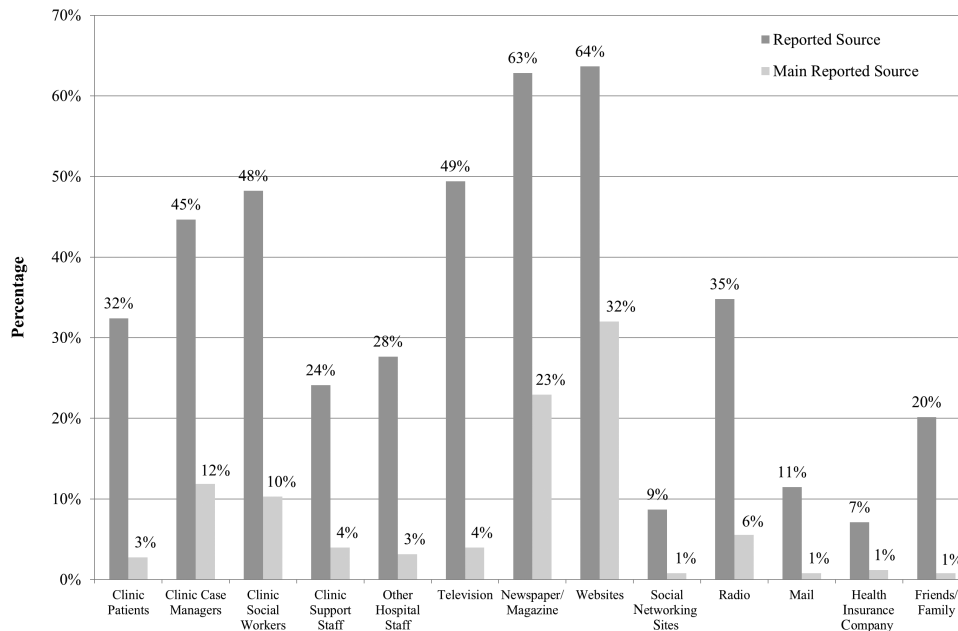


Figure 3. Human immunodeficiency virus medical providers' sources of Affordable Care Act (ACA) information. Participants were asked from a list of the answers about all of their sources of ACA knowledge and about their main source of ACA information.

nonexpansion states (71% vs 57%, $P = .04$). In terms of specific topics that those in Medicaid nonexpansion states knew better than those in Medicaid expansion states, they were more likely to know that the ACA provides subsidies for people with low incomes to purchase health insurance (92% vs 83%, $P = .03$; [Figure 5A](#)). Additionally, they were more likely to be aware of their state's Medicaid status (80% vs 68%, $P = .04$; [Figure 5B](#)).

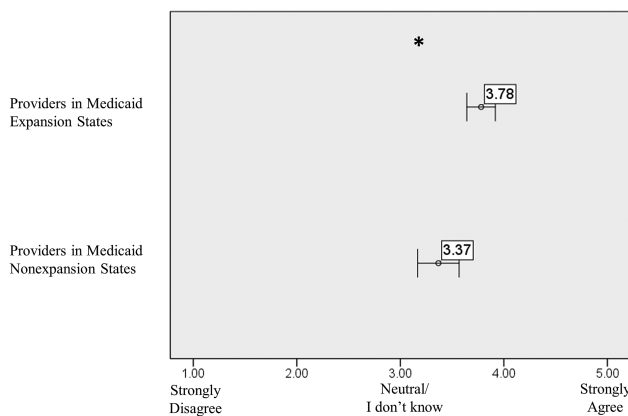


Figure 4. Mean response of human immunodeficiency virus (HIV) medical provider participants to the statement "The Affordable Care Act (ACA) will improve my HIV outcomes." Participants were asked to agree or disagree with statements about the ACA in order to capture their attitudes toward the ACA (see [Figure 2](#) for a list of the statements). Participants were asked to select from the following options on a Likert scale from 1 to 5: "strongly disagree," "disagree," "neutral/don't know," "agree," and "strongly agree." The circle represents the mean response, and the whiskers represent the standard deviation. * $P < .05$ for a Mann-Whitney U test to assess whether the distribution of answers across the Likert scale differed between participants based on their state's Medicaid expansion status.

One's reported main source of ACA knowledge was not associated with getting all 4 questions correct ($P = .07$), so this was not included in the multivariable regression. Among reported sources of knowledge, reporting use of newspapers or magazines, websites, and radio was associated with getting all 4 questions correct ([Table 2](#)). In addition, those sources as well as clinic case managers were associated with a different distribution of the number of correct answers ($P = .04$). Given these results, reporting the use of newspapers or magazines, websites, radio, and clinic case managers was included in the multivariable regression. Other sources of information are omitted from the table, as they were not associated with correct knowledge or a difference in the distribution of the number of correct answers.

In multivariable logistic regression controlling for type of medical provider, years of HIV experience, and reported sources of ACA information that were associated with the number of correct answers, the factors associated with getting all 4 knowledge questions correct include provider practicing HIV medicine in a Medicaid nonexpansion state (aOR, 2.07; 95% CI, 1.11–3.88), obtaining knowledge from case managers (aOR, 1.89; 95% CI, 1.03–3.48), and obtaining knowledge from newspapers/magazines (aOR, 1.94; 95% CI, .99–3.81).

DISCUSSION

The majority of participants were attending physicians. Almost 30% had been providing HIV medical care for <5 years and an equal number had been in practice for >20 years. Our study reveals wide ranges of sources used to gain ACA knowledge. Interestingly, 32% of HIV medical providers reported learning

Table 2. Association of Respondent Characteristics and Sources of Affordable Care Act (ACA) Knowledge With Correct ACA Knowledge

Characteristic	OR (95% CI)	P Value	Adjusted OR (95% CI)	P Value
Type of medical provider		<.001		.007
Fellow physicians	0.19 (.90–.41)		0.25 (.09–.73)	
Physician assistants	0.19 (.05–.75)		0.25 (.06–1.14)	
Nurse practitioners	1.46 (.62–3.44)		1.72 (.68–4.32)	
Attending physicians	Reference		Reference	
Length of time providing HIV care		<.001		.3
<5 y	0.35 (.20–.61)		0.64 (.27–1.52)	
>5 y	Reference		Reference	
Medicaid expansion status of state of HIV practice ^a		.03		.02
Medicaid nonexpansion	1.82 (1.06–3.14)		2.07 (1.11–3.88)	
Medicaid expansion	Reference		Reference	
Clinic case managers as ACA knowledge source ^{b,c}		.10		.04
Yes	1.55 (.91–2.63)		1.89 (1.03–3.48)	
No	Reference		Reference	
Newspapers/magazines as ACA knowledge source		.002		.05
Yes	2.33 (1.36–3.99)		1.94 (.99–3.81)	
No	Reference		Reference	
Websites as ACA knowledge source		.01		.06
Yes	2.04 (1.19–3.49)		1.81 (.98–3.35)	
No	Reference		Reference	
Radio as ACA knowledge source		.005		.06
Yes	2.30 (1.28–4.13)		1.97 (.97–3.99)	
No	Reference		Reference	

Abbreviations: ACA, Affordable Care Act; CI, confidence interval; HIV, human immunodeficiency virus; OR, odds ratio.

^aMedicaid status of state of HIV practice at time of survey distribution (December 2014 for Virginia; August 2015 for all other states).

^bSources of knowledge are included in this table if (1) they were associated with providers getting all 4 knowledge questions correct or (2) they were associated with a different distribution of the number of correct knowledge questions compared with not using the source of knowledge

^cReporting clinic case managers as a knowledge source was associated with a different distribution of the number of correct knowledge questions compared with not reporting clinic case managers as a knowledge source.

ACA information from their clinic patients. Websites and newspapers or magazines were the 2 most commonly reported sources, and they were most often cited as a medical provider's main source of ACA information. Slightly more than 1 of 10 participants reported clinic case managers as their main source of ACA information. This was the third most common response. In addition, almost a third of medical providers reported that 1 of the following clinic/hospital staff was their main source: clinic case managers, clinic social workers, clinic support staff, or other hospital staff.

In a recent study of PLWH who receive care at an academic medical center in Nebraska, the most common sources of ACA knowledge reported were television (59%) and medical providers' office staff (50%) [9]. Television was the third most commonly reported source for HIV medical providers, but only 4% said that it was their main source.

While the majority of participants answered all 4 knowledge questions correctly, there are still knowledge gaps. Approximately one-third of participants answered "I don't know" to at least 1 question. Almost 20% did not know that the ACA provides subsidies for people with low incomes to purchase health insurance. More than 10% did not know that the ACA makes it illegal to exclude a person from an insurance plan

due to a preexisting condition. Moreover, 1 in 10 participants did not know that the ACA does not eliminate the Ryan White Program.

From our survey, we found that 91% knew that the ACA does not eliminate the federal Ryan White Program. This is in contrast to a recent survey of PLWH who receive care in an academic Ryan White clinic in Nebraska. In their survey, 74% were not sure whether the ACA eliminates the Ryan White. This is a key area where the majority of HIV medical providers have correct information and could use their knowledge to inform and reassure PLWH [9].

In our study, 71% of HIV medical providers knew correctly whether or not their state had elected to expand Medicaid with 20% answering "I don't know" and the remainder answering incorrectly. The percentage of HIV medical providers who correctly knew their state's Medicaid expansion status is slightly higher than what was found in a recent Kaiser Family Foundation survey of primary care providers' ACA knowledge. In their study, 59% of physicians and 55% of nurse practitioners and physician assistants answered whether or not their state had expanded Medicaid correctly [10].

Additionally, our data demonstrated that those in Medicaid nonexpansion states were more likely to be aware of their state's

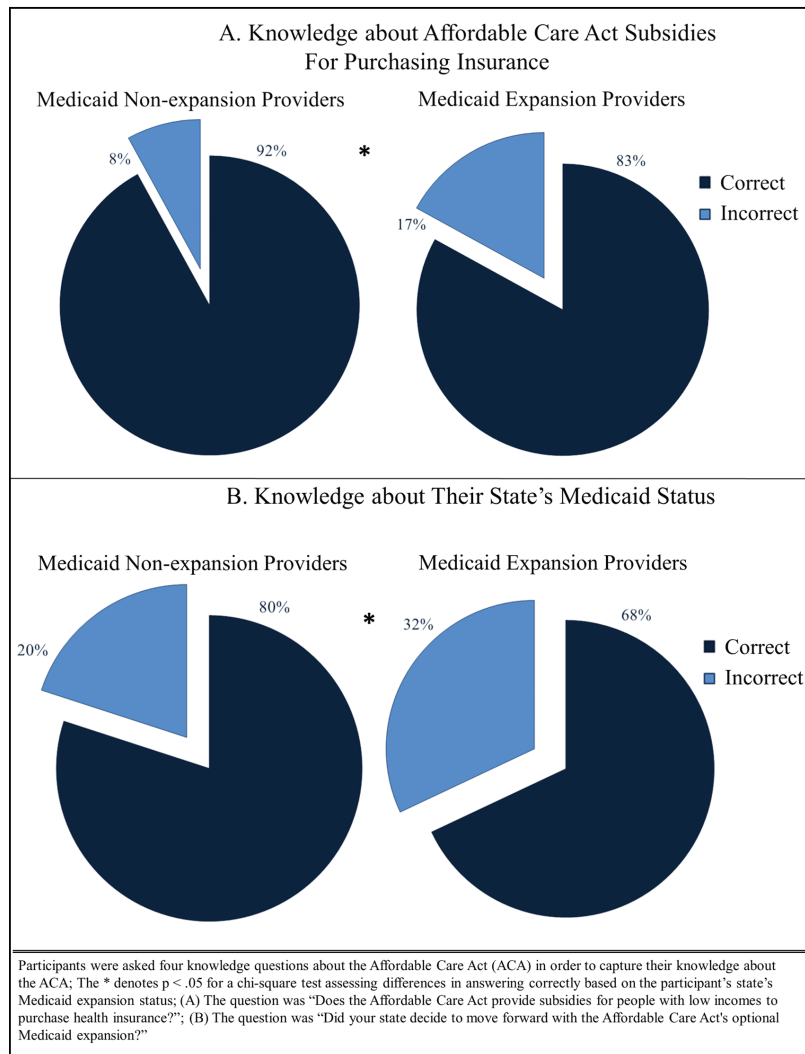


Figure 5. Participants' knowledge about Affordable Care Act (ACA) subsidies for purchasing insurance (A) and their state's Medicaid expansion status (B). Participants were asked 4 knowledge questions (see Figure 1) about the ACA to capture their knowledge about the ACA. The two knowledge questions that varied based on a participant's state's Medicaid expansion status are shown. A, The question was "Does the Affordable Care Act provide subsidies for people with low incomes to purchase health insurance?" B, The question was "Did your state decide to move forward with the Affordable Care Act's optional Medicaid expansion?" * $P < .05$ for χ^2 test assessing differences in answering correctly based on the participant's state Medicaid expansion status.

Medicaid status, with 80% correctly knowing their state's Medicaid status compared with 68% of those in Medicaid expansion states. Overall, these values were higher than the percentage of primary care physicians who knew their state's Medicaid status in a recent study [10]. Additionally, the study found the opposite relationship, with a higher percentage of primary care physicians knowing their state's Medicaid status when they were located in a Medicaid expansion state vs a nonexpansion state (62% and 54%, respectively) [10]. Primary care physicians in Medicaid expansion states may have been more aware of the policy change than HIV medical providers because primary care physicians likely saw an influx of new patients who had gained Medicaid whereas HIV medical providers were providing care to uninsured and underinsured PLWH before the ACA due to federal Ryan White funding [11].

The importance of systems-based practice has been increasingly recognized as healthcare delivery has become more complicated. The ACGME introduced systems-based practice as 1 of 6 clinical competencies in 1999, and recently this competency, along with the others, became more concrete with the addition of competency-specific milestones as a part of its Next Accreditation System in 2012 [12]. Additionally, more specific to HIV, being knowledgeable about available community resources has been cited as being essential component of being an excellent infectious diseases clinician [13]. Courses in medical school, residency, and fellowship as well as courses offering Continuing Medical Education credits should address information about the ACA and Medicaid expansion so that medical providers can help their patients navigate the increasingly complex system.

The average HIV medical providers' response indicates that they "agree" with the following 2 statements: (1) "The ACA will improve the United States' health outcomes" and (2) "The ACA will improve my HIV patients' non-HIV outcomes." There was no statistical difference between the responses for these 2 questions from providers based on their state's Medicaid expansion status. However, HIV medical providers in Medicaid expansion states were more optimistic about the ACA's likelihood to improve their patients' HIV outcomes. This is notable given that the average published pre-ACA viral suppression rate for PLWH on Medicaid has been reported to be 65%–68% [11, 14]. A recent abstract used data from the Medical Monitoring Project to report that from pre-ACA to the first year of the ACA, viral suppression increased from 74% to 78% for PLWH with Medicaid in Medicaid nonexpansion states and increased from 75% to 80% for PLWH with Medicaid in Medicaid expansion states [15]. A statistical test was not performed to analyze if the increases in viral suppression in the 2 types of states were statistically different. Publicly available data from the Ryan White HIV/AIDS Program demonstrates that of clients with Medicaid, 82% achieved viral suppression in 2016 [16]. For comparison, in a Medicaid nonexpansion state, Virginia AIDS Drug Assistance Program clients who were purchased ACA Qualified health plans achieved a viral suppression rate of 85% [17].

This survey reveals that providers retain accurate information about the ACA from websites, newspapers or magazines, and clinic case managers. HIV medical providers in Medicaid nonexpansion states have better knowledge about the ACA in terms of insurance subsidies, preexisting conditions, Medicaid expansion, and its interaction with the Ryan White Program. It is unclear why this would be, but one hypothesis is that HIV medical providers in Medicaid nonexpansion states may have been nervous about the implications for their patients and read more about the ACA. Future work will need to assess reasons for the difference in ACA knowledge based on one's state's Medicaid status.

This study has several limitations. Our study population was limited to HIV medical providers who were affiliated with an ACGME-accredited infectious diseases fellowship program. This was done primarily due to the inability to obtain email addresses for private-practice HIV medical providers in a systematic way. There was a low response rate, and unfortunately no information is available on the HIV medical providers who did not respond to the invitation to participate in the study. People who responded may have been more likely to know about the ACA and/or think positively about the ACA, so we may overestimate knowledge or positive attitudes. It is possible that some providers were not as familiar with the term "Affordable Care Act" and may have been more familiar with the term "Obamacare" or a state-specific term for their state health insurance market. Due to the anonymous nature of this online survey, no data on HIV medical providers who were invited to participate and declined were collected. Sampling bias is possible, and generalization of the results should be approached with caution. Despite these limitations, this is the

only study that we are aware of to investigate HIV medical providers' knowledge and attitude about the ACA.

Since this survey was completed, the political and health policy landscape has changed, and there may be substantial upcoming changes to the ACA, Medicaid expansion, and HIV healthcare delivery [18–20].

As a clinic-based resource that was associated with correct ACA knowledge, clinic case managers should be engaged by HIV medical providers to improve knowledge of health system shifts and to enhance systems-based practice. Another resource would be including a module on systems-based practice in the AIDS Education and Training Center Program's National HIV Curriculum or having the Ryan White HIV/AIDS Program require training on systems-based practice for medical providers who are federally funded.

Notes

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