

Indicators of self-reported human immunodeficiency virus risk and differences in willingness to get tested by age and ethnicity

An observational study

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Abstract

There are many barriers that prevent people from receiving human immunodeficiency virus (HIV) testing; however, little is known about the impact of age and ethnicity on HIV testing. We explored differences in self-reported HIV risk and willingness to be tested in the 2014 Get Tested Coachella Valley Community Survey by age and ethnicity.

Data were collected from 995 participants via survey methods (online, hard copy, and in person). Surveys asked about demographics, sexual history, HIV testing history, thoughts on who should get tested, and future preferences for HIV testing.

Most participants were women (62.5%), Hispanic (55.8%), and older than 50 years (51%). Participants who did not receive testing said they did not do so because they did not perceive themselves as at risk of contracting HIV (51.8%). Many participants (24.1%) said they did not receive testing because their health care provider never offered them the HIV test. Participants were more likely to have been tested if they were between 25 and 49 years old, compared to participants aged 50 or older (70.2% vs 48.6%, respectively, $P < .001$). Participants who were not Hispanic or Latino were more likely to have had an HIV test compared to Hispanic or Latino participants (62.5% vs 51.1%, $P < .001$).

Interventions are needed to reach older adults to address HIV testing and beliefs. These interventions must debunk beliefs among physicians that older adults are not sexually active and beliefs among older adults that only certain populations are at risk of HIV.

Abbreviations: CDC = Centers for Disease Control and Prevention, GTCV = Get Tested Coachella Valley, HIV = human immunodeficiency virus, MSM = men who have sex with men.

Keywords: barriers to testing, Coachella Valley, human immunodeficiency virus testing

1. Introduction

More than 1 million people are living with human immunodeficiency virus (HIV) in the United States, yet up to 25% may be unaware of their status.^[1] Approximately 70% of new HIV cases

are attributable to individuals unaware of their HIV-positive serostatus.^[2] An intervention exists for this significant health problem: HIV testing. Attitudes and norms regarding HIV testing and intention to be tested play a role in HIV testing. Several studies have presented data on predictors of accepting HIV testing and intention to receive HIV testing in diverse groups, including Hispanic farmworkers, older adults, African American men who have sex with men (MSM), transgender women, and homeless women.^[3–8] Stigma, education, provider recommendations, risk perceptions, and cost are among major factors contributing to accepting HIV testing and intention to receive HIV testing.

Several existing barriers to HIV testing have been identified in the literature: lack of knowledge and training, lack of patient acceptance, and competing priorities during medical visits.^[9] Stigma associated with HIV testing may be another barrier, because many individuals still see HIV as a disease affiliated with homosexuality and attributed to anal sex.^[10] Studies and data related to barriers to HIV testing among aging populations, including low perceived HIV risk for patients among health care providers and at-risk individuals themselves, are lacking in the scientific literature.

Some research has shown that older adults are less likely to have ever been tested for HIV compared to younger adults.^[11,12] Although many older adults opt out of HIV testing,^[4,13] providers often do not offer HIV tests to older adults^[14,15] due to ageist assumptions about older adults' sexual or drug use behaviors.^[14,16] As a result, older adults infected with HIV are

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more likely than younger people to go undiagnosed or be diagnosed later in the disease course.^[13,17,18]

In one study, emergency department providers supported routine HIV testing, but did not want to administer tests due to barriers of inadequate time and resources and concerns regarding how to provide follow-up care.^[19] Providers from community health centers reported similar feelings, noting additional problems of discomfort among all involved parties (provider, patient, and community) and inconsistent awareness of Centers for Disease Control and Prevention (CDC) recommendations regarding HIV testing.^[20] However, patients interviewed in an emergency department overwhelmingly viewed HIV testing in the emergency department as a positive feature, with <5% stating that testing is undesirable due to fear of knowing one's HIV status.^[21] Patients in settings where HIV testing is not compulsory or routine may associate HIV testing with stigma, and thus either avoid HIV testing or find other reasons to go to clinics to disguise the true purpose of receiving HIV testing.^[22] Certain populations, such as African American MSM, may face additional negative perceptions of HIV testing besides stigma, namely homophobia, and lack of support from a homophobic community or family may discourage HIV testing.^[23]

2. Impact of interventions on increasing HIV testing uptake

Despite CDC recommendations for routine, opt-out HIV testing for all patients in health care settings, research suggests that health care providers' practices vary.^[20,21] Few US interventions have focused on increasing HIV testing uptake, compared to interventions abroad. Local interventions have focused on social marketing and media technology. For example, an intervention conducted among Latinos living along the California-Mexico border used social marketing techniques, such as advertising in print, online, and radio in Spanish and offering a toll-free hotline service in Spanish, leading to increased HIV testing at clinics during the active campaign.^[24] Another intervention offered a 15-minute video to people who declined HIV tests in an emergency department, prompting one third of participants to accept an HIV test.^[25] In a community-based participatory research intervention delivered in Internet chat rooms frequented by MSM, an interventionist posted frequently about HIV testing and allowed other chat room users to send private messages to gain more information; the result was a significant increase in self-reported testing among the chat room participants.^[26]

3. Setting

Riverside County is California's fourth-largest county by population. More than half (63%) of all people living with HIV and acquired immunodeficiency syndrome in Riverside County are in the Coachella Valley.^[27] Approximately 24% of people living with HIV in the Coachella Valley are aged 60 or older; racial and ethnic composition is 74.4% Caucasian and 19.7% Hispanic.^[27] The incidence of HIV in the Coachella Valley has ranged from 27.2 to 1416.9 cases per 100,000 people, far greater than the estimated overall HIV incidence in California of 16.7 cases per 100,000.^[27-29] In part, this high rate is due to the large population of older MSM living with HIV in Palm Springs. About half of Coachella Valley older adults are sexually active (53.0%), and the majority (88.4%) do not use a condom during sex because they are married or in a monogamous relationship, indicating a belief that their risk of contracting a

sexually transmitted disease is relatively low.^[30] However, many of these individuals may not know their HIV status, because 72.3% have never been tested for HIV despite Medicare coverage of testing.^[30,31] Therefore, although free HIV testing is available to most, many individuals are neither offered nor seek testing. Consistent with recommendations from the CDC, numerous California State policies emphasize and attempt to increase routine, opt-out HIV testing for all patients in California health care settings.^[32] However, as described above, numerous studies show significant barriers remain.

4. Present study

Little is known about the impact of age and ethnicity on the acceptance of HIV testing among health care providers and patients or on individuals' intention to receive HIV testing. We explored differences in self-reported HIV risk and willingness to be tested in the 2014 Get Tested Coachella Valley (GTCV) Community Survey by age and ethnicity.^[33] Our hypothesis is that older individuals and those taking the survey in Spanish are less likely to have had an HIV test.

5. Methods

Launched in 2014, GTCV seeks to combat the HIV epidemic in the Coachella Valley region of Southern California. This regional public health campaign strives to reduce HIV incidence by making HIV testing a routine medical practice and providing linkage to care for individuals who test positive.^[31] GTCV uses multiple approaches to make HIV testing a routine medical practice, such as educating providers so that they ask patients to opt-in to HIV testing, educating patients so that they ask their providers to test them, and working with organizations to develop opt-out HIV testing protocols. Before GTCV, HIV testing was not performed routinely in the Coachella Valley, nor was it offered at wellness checks-ups. Although individuals with health insurance can receive free HIV testing, there remains a lack of consistency between individual health care providers and health care systems. Data were collected from participants aged 12 years or older from June 25 to July 15 using 3 modes of survey dissemination: online (surveymonkey.com), hard copy, and in person. Primary recruitment occurred through 46 GTCV partners, which included Coachella Valley municipalities, medical centers, businesses, and nonprofits. To avoid biasing the sample toward people who already get tested for HIV, sexual health and HIV service providers were excluded from recruitment efforts. Additional participants were recruited from churches, senior centers, and mobile HIV testing vans offering health screenings. The online survey was promoted via weekly posts on the Facebook and Twitter accounts of health assessment and research for communities, a health assessment and research nonprofit in Palm Desert; Facebook ads (English and Spanish) targeting people aged 13 or older living within 50 miles of Palm Desert (an estimated 400,000 Facebook users); and press releases (English and Spanish) distributed to various media channels. For in-person data collection, a trained, bilingual data collector went to specified locations for approximately 4 hour periods and invited people to participate in the survey. This method sought segments of the target population who were unlikely to be reached either by the online survey or static printed surveys displayed at various locations. For this project, 2 distinct target audiences were pursued: residents of the East Valley and adults older than 65 years.

The survey featured 18 questions assessing: demographics, media use, general health and medical care use, sexual history, HIV testing history, thoughts on who should get tested, and future preferences for HIV testing. All quantitative analyses were performed using Stata 12.0. Means, frequencies, and percentages were computed for all variables. Associations of aging and ethnicity with HIV testing history and testing perceptions were assessed using contingency tables and chi-square tests or Fisher exact tests. Differences in means were computed using *F* tests. Logistic regression was used to assess the unadjusted and adjusted association of age and ethnicity with selected sample characteristics. The final multivariate logistic regression model included variables significant in univariate analyses.

To encourage people to take the survey, participants had the chance to win one of ten \$50 Visa gift cards, which can be used anywhere credit cards are accepted. The last page of the survey asked participants to enter their name and contact information (phone number or email) if they would like to be entered to win. For the purposes of this analysis, all participant contact information was removed. We received an exempt approval from the University of California, Riverside institutional review board due to the fact that all participants in this secondary data analysis were unidentifiable.

6. Results

Of 995 participants who took the survey, 953 stated whether they had ever been tested for HIV in the past; 44% had never been tested (Table 1). Among those who received testing, 45.6% had their test at a doctor's office, 25.1% at a community clinic, and 10.0% at a health fair. Most participants were women (62.5%), Hispanic (55.8%), and older than 50 (51%), and 33% took the survey in Spanish. A majority of participants were White (*n*=

585); 230 participants identified as other, 29 as African American, 19 as Asian or Pacific Islander, and 17 as American Indian or Alaska Native. Most participants (51%) made <\$25,000 per year, whereas 19% made \$75,000 or more. Participants were from Indio (18.1%), Palm Springs (16.7%), Coachella (11.4%), Cathedral City (10.3%), Mecca (9.7%), and Desert Hot Springs (7.3%). Regarding health care, 85% of participants reported having access to care when they needed it, 77.7% had a routine checkup with their doctor each year, and 53% received an annual flu shot.

Participants were asked whom should be tested for HIV, and 876 responded. Few respondents (1.5%) reported that no one needs to be tested; 8.6% reported that only people with a high risk of HIV should be tested; 42% reported that all adults and teens need to be tested; and 48% reported that all sexually active people need to be tested.

Participants who had ever been tested for HIV were asked about their reasons for obtaining testing (Table 2). Among these participants, 141 (24.5%) received HIV testing because their health care provider offered to do the test; 120 (20.8%) received testing because it was offered free of charge at an event or community location; 117 (20.3%) received testing because of expert recommendations that everyone should receive HIV testing; and 106 (18.4%) received testing because they feared they were exposed to HIV. Reasons for receiving HIV testing also included having friends or family members who said testing was a good idea (8%), testing was required by an employer or insurer (6.1%), and the HIV-positive status of a partner (2.8%). Many participants (19.4%) cited various other reasons for receiving HIV testing (not shown in table) including pregnancy, blood donation, marriage, immigration, cheating spouse, surgery, routine testing, a new relationship, serious illness, other risks, mandatory testing, and responsibility.

Table 1
Human immunodeficiency virus testing history and related factors among 995 participants taking the community survey.

	Overall n (%)	Not Tested n (%)	Tested n (%)	Unadjusted association		Adjusted Association	
				<i>P</i>	OR (95% CI)	<i>P</i>	OR (95% CI)
Age*	48.5 (0.6)	51.5 (1.0)	45.5 (0.7)	<.001		<.001	
12–24	109 (11.5)	54 (49.5)	55 (60.5)	<.001	Ref	<.001	Ref
25–49	357 (37.8)	103 (29.8)	243 (70.2)		2.40 (1.55, 3.73)		2.24 (1.35, 3.74)
50–64	304 (31.8)	126 (42.8)	168 (57.1)		1.36 (0.87, 2.11)		1.09 (0.63, 1.87)
65+	175 (18.3)	108 (67.5)	52 (32.5)		0.49 (0.30, 0.81)		0.50 (0.26, 0.93)
Sex							
Male	359 (37.1)	138 (38.4)	221 (61.6)	.008	Ref	<.001	Ref
Female	593 (62.3)	280 (47.2)	313 (52.8)		0.69 (0.53, 0.91)		0.30 (0.19, 0.46)
Ethnicity							
Hispanic or Latino	519 (55.3)	254 (48.9)	265 (51.1)	<.001	Ref	.212	Ref
Other	419 (44.7)	157 (37.5)	262 (62.5)		1.60 (1.23, 2.08)		1.32 (0.85, 2.06)
Income							
<25,000	451 (49.7)	226 (50.1)	225 (49.9)	<.001	Ref	.658	Ref
25,000+	455 (50.2)	168 (36.9)	287 (63.1)		1.72 (1.32, 2.24)		0.92 (0.64, 1.32)
Sex partners†							
Men only	541 (58.0)	178 (32.9)	363 (67.1)	<.001	Ref	<.001	Ref
Women only	228 (24.4)	119 (52.2)	109 (47.8)		0.45 (0.33, 0.62)		0.17 (0.11, 0.28)
Men and women	25 (2.7)	5 (20.0)	20 (80.0)		1.96 (0.72, 5.31)		1.32 (0.47, 3.75)
None	139 (14.9)	104 (74.8)	35 (25.2)		0.16 (0.11, 0.25)		0.22 (0.13, 0.37)
Language							
English	666 (66.9)	243 (37.8)	400 (62.2)	<.001	Ref	.004	Ref
Spanish	329 (33.1)	176 (56.8)	134 (43.2)		0.46 (0.35, 0.61)		0.52 (0.33, 0.81)

* Values reflect *M* (*SD*) in first 3 columns.

† During prior 10 years.

CI=confidence interval, HIV=human immunodeficiency virus, OR=odds ratio.

Table 2
Barriers and facilitators to human immunodeficiency virus testing by age categories.

Reason	Overall		Young Adult		Adult		Old Adult		Older Adult	
	n	%	n	%	n	%	n	%	n	%
Facilitators										
I was concerned I might have been exposed to HIV	106	18.4	11	20.4	40	16.5	36	21.4	17	32.7
My sexual partner is HIV positive	16	2.8	0	0.0	5	2.1	8	4.8	3	5.8
My health care provider offered to do the test	141	24.5	22	40.7	72	29.6	38	22.6	5	9.6
It was offered for free at an event or community location	120	20.8	17	31.5	56	23	29	17.3	14	26.9
It was required by my employer or insurer	35	6.1	1	1.9	17	7	13	7.7	3	5.8
Experts recommend that everyone get tested, so I did	117	20.3	16	29.6	44	18.1	43	25.6	12	23.1
My friend or family member said testing is a good idea, so I got tested	46	8.0	8	14.8	17	7	16	9.5	4	7.7
Other	112	19.4	6	11.1	56	23	37	22	8	15.4
Barriers										
Reason										
I don't think I'm at risk of getting HIV	239	51.8	29	52.7	53	51.5	89	70.6	61	56.5
I'm not sexually active	98	21.3	21	38.2	5	4.9	26	20.6	39	36.1
My doctor or health care provider has never offered to test me for HIV	111	24.1	12	21.8	31	30.1	31	24.6	33	30.6
I don't want my doctor or anyone else to judge me	15	3.3	4	7.3	2	1.9	3	2.4	6	5.6
I'm too embarrassed to get tested	11	2.4	3	5.5	1	1	1	0.8	6	5.6
I don't want to know if I have HIV	12	2.6	1	1.8	4	3.9	1	0.8	6	5.6
I don't know where to get tested	29	6.3	3	5.5	6	5.8	8	6.3	11	10.2
I don't have the transportation needed to get to a testing site	11	2.4	0	0.0	2	1.9	6	4.8	3	2.8
I can't afford to get tested	14	3.0	2	3.6	2	1.9	4	3.2	6	5.6
I don't have health insurance	24	5.2	8	14.5	11	10.7	4	3.2	1	0.9
Other	35	7.6	5	9.1	13	12.6	8	6.3	8	7.4

Young adult=12–24 years old; adult=25–49 years old; old adult=50–64 years old; older adult=65 years old or older.
HIV=human immunodeficiency virus.

Participants who never received HIV testing were asked questions to assess barriers that kept them from being tested. Among these participants, most did not receive testing because they did not perceive themselves as at risk of contracting HIV (51.8%). In addition, 111 (24.1%) participants said they did not receive testing because their health care provider never offered them the HIV test; 80% of untested participants said they would receive testing if offered by their provider. Others cited a lack of sexual activity as a reason for not receiving testing ($n=98$, 21.3%). Other reasons for not being tested included not knowing where to go for HIV testing (6.3%), lack of health insurance (5.2%), fear of negative judgment from health care providers or others (3.3%), not wanting to know one's HIV status (2.6%), being too embarrassed to receive testing (2.4%), and a lack of transportation (2.4%).

Significant differences by age occurred in participants' reasons for obtaining HIV testing and barriers that prevented them from receiving a test. Compared to participants younger than 50 years, significantly fewer participants aged 50 years or older accepted HIV testing when it was offered by a health care provider ($P<.01$). Significantly more participants aged 50 years or older, compared to those younger than 50 years, stated they are not at risk of HIV ($P=.02$) and are not sexually active ($P=.01$).

Several factors were significantly related to the likelihood that participants had received an HIV test (Table 1). Significant differences were found between the four age groups ($P<.001$), with the highest likelihood of testing (70.2%) for participants between 25 and 49 years old and the lowest likelihood of testing (32.5%) for participants aged 65 years or older. Men were more likely than women to have been tested (61.6% vs 52.8%, $P=.008$). Participants who were not Hispanic or Latino were also more likely to have had an HIV test compared to Hispanic or Latino participants (62.5% vs 51.1%, $P<.001$), as were participants who took the English version of the survey compared

to those who took the Spanish version (62.2% vs 43.2%, $P<.001$). Participants with an annual income of \$25,000 or greater were more likely than those making <\$25,000 to have been tested (63.1% vs 49.9%, $P<.001$). Last, the sex of participants' sex partners in the last 10 years was significantly associated with the likelihood of having had an HIV test ($P<.001$), with higher likelihood of testing for participants whose sex partners have been only men or both men and women than for those whose sex partners have been only women or those without sex partners. These significant factors were included in a multivariate logistic regression analysis, and the results were qualitatively similar to the univariate analyses except for ethnicity and income, whose adjusted associations became nonsignificant, possibly due to their collinearity with language.

7. Discussion

This study examined differences in age and ethnicity in self-reported HIV risk and willingness to receive HIV testing. Most untested participants did not believe they were at risk. Moreover, significantly fewer participants aged 50 years or older stated they were at risk of HIV compared to participants younger than 50 years, and they were less likely to be tested for HIV compared to participants aged 25 to 49 years. In addition, significantly fewer participants aged 50 years or older accepted HIV testing when it was offered by a health care provider, compared to younger participants.

These findings are consistent with previous research showing that older adults tend to underestimate their HIV risk and severely delay HIV testing or forgo testing altogether.^[4,34,35] In a sample of at-risk older women, Akers et al.^[36] found that participants who lacked interest in receiving HIV testing had a low perception of HIV risk. Also consistent with our findings are studies that showed older adults are more likely than younger

adults to be diagnosed with HIV later in the disease course,^[37] often following significant symptoms or hospitalization.^[38] Research also has suggested that older adults view HIV as a disease experienced primarily by young adults and that older adults are not the type of people who contract the disease.^[13] This perception may contribute to older adults' lower likelihood of receiving testing and lower perceptions of HIV risk.

Our findings also show that many participants had not received HIV testing because their health care providers had not offered the test. A majority stated they would get tested if offered by their health care provider. Thus, despite recommendations for opt-out HIV testing for all patients in health care settings from the CDC,^[39] our results suggest that many GTCV participants' physicians do not routinely offer opt-out HIV testing. Previous research revealed several barriers that prevent physicians from offering HIV tests to their patients. Brown et al.^[40] examined data from physicians who participated in the GTCV and found that such barriers include competing priorities during clinical visits, limited time, discomfort with discussing HIV, and uneasiness about patient reactions. A review of the relevant literature found similar barriers.^[9] The finding that many participants would get tested if their health care provider offered testing demonstrates the importance of physicians discussing and routinely recommending HIV testing.

The results of this study show that Hispanic and Latino participants were less likely to receive HIV testing than non-Hispanic or Latino participants. A national household survey in 2006 showed that the rate of HIV testing in the prior 12 months was higher among Hispanics than non-Hispanics.^[41] However, other research suggested that Hispanics and Latinos have relatively low levels of HIV testing compared to African Americans and non-Hispanic Whites, and that Hispanics are more frequently diagnosed with HIV later in the disease course than non-Hispanic Whites.^[42,43] Timely HIV testing is especially important for the Hispanic community in the United States because Hispanics are disproportionately affected by HIV.^[44] Barriers to timely HIV testing among Hispanics and Latinos may include a lack of acculturation and English language proficiency, stigma, undocumented status, lack of formal education on HIV, and inadequate health insurance.^[45]

This study has several limitations. The use of a convenience sample in this study may have resulted in sampling bias. As such, it is not clear whether these findings are easily generalizable to areas of the United States beyond the Coachella Valley. Furthermore, most cities in the Coachella Valley are over- or underrepresented in our sample. Thus, it is unclear whether the findings are generalizable to cities not adequately represented in our sample. In addition, the self-reported HIV risk factors may have assumed that participants knew the risk factors for HIV, which may not have been the case. Some response categories overlapped one another, but since questions allowed for a single response, they were mutually exclusive. Moreover, while not collected, data on common HIV risk factors among participants, such as intravenous or other recreational drug use, multiple sex partners, and high-risk sexual behaviors would have been useful. Last, the survey did not include questions about HIV status or whether participants were ever asked to receive an HIV test.

This study showed that most participants not tested for HIV did not believe that they are at risk and that untested participants would get tested if the service was offered by their provider. These findings show that despite CDC recommendations for HIV testing, significant barriers remain. Health care providers should talk directly with their patients during clinical visits about HIV

prevention, HIV risk, and they should routinely offer HIV screening. Providers need training for how to have these discussions and effectively communicate risk. Interventions are especially needed to reach older adults to address HIV testing and unrealistic risk beliefs. These interventions must debunk beliefs among physicians that older adults are not sexually active and beliefs among older adults that only certain populations are at risk of HIV.^[13]

8. Other information

A peer reviewed abstract of partial results from this study was accepted and presented at the 2016 American Public Health Association conference in Denver, Colorado. Thanks to Jo Gerrard for editorial support.

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