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ORIGINAL PAPER

Patterns of HIV Disclosure and Condom Use Among HIV-Infected Young Racial/Ethnic Minority Men Who Have Sex with Men

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Abstract Recent findings highlight the continued rise in cases of HIV infection among racial/ethnic minority young men who have sex with men (YMSM). In adults, disclosure of HIV status has been associated with decreased sexual risk behaviors but this has not been explored among YMSM. In this study of 362 HIV-infected racial/ethnic minority YMSM, rates of disclosure were high, with almost all disclosing their status to at least one person at baseline. The majority had disclosed to a family member, with higher disclosure rates to female relatives compared with males. After adjustment for site, disclosure to sex partners and boyfriends was associated with an increase in condom use during both oral and anal sex. Future studies should consider skills training to assist youth in the disclosure process, facilitate how to determine who in their family and friend social network can be safely disclosed to and support family-based interventions.

Resumen Los resultados recientes destacan el continuo aumento de los casos de infección por VIH entre los hombres de las minorías raciales/étnicas jóvenes que tienen sexo con hombres (YMSM). En los adultos, la revelación del estado de VIH se ha asociado con una disminución de las conductas sexuales de riesgo, pero esto no ha sido explorado entre YMSM. En este estudio de 362 infectados por el VIH YMSM minoría racial/étnico, las tasas de revelación fueron altas, con casi toda revelación de su estado al menos una persona en la línea base. La mayoría había revelado a un miembro de la familia, con tasas más altas de divulgación a familiares mujeres en comparación con los varones. Después del ajuste para el sitio, la revelación a las parejas sexuales y los novios se asoció con un aumento en el uso del condón durante el sexo oral y anal. Los estudios futuros en cuenta la formación profesional para ayudar a los jóvenes en el proceso de divulgación, facilitar la forma de determinar quién en su familia y la red social puede ser amigo de forma segura y compartida con las intervenciones de apoyo basadas en la familia.

Keywords MSM · HIV disclosure · Racial/ethnic minority · Condom use

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Introduction

The rates of HIV infection among racial/ethnic minority young men who have sex with men (YMSM) suggest that without heightened primary prevention efforts aimed at reducing risk among minority MSM, the epidemic will continue to rage uncontrollably in this population [1, 2]. Novel approaches to stemming the epidemic among MSM,

particularly racial/ethnic minority YMSM, are greatly needed as highlighted in the National HIV/AIDS Strategy [3]. In response to these rising infection rates, prevention efforts have shifted toward more routine testing and a greater emphasis on prevention interventions with HIV-infected individuals, including interventions aimed at reducing transmission by increasing HIV disclosure [4, 5].

The decision to disclose one's HIV status is multifaceted and influenced by structural, relational, and personal considerations. Previous research has identified factors that influence decisions about disclosure including HIV-related stigma, expectations of reactions and resulting changes in social support [6–8], type and nature of the social relationship [8–14], age, education, race/ethnicity and time since diagnosis [4, 15–17]. In addition, concerns about discrimination, rejection, relationship disruption and intimate partner violence pose barriers to HIV status disclosure in adults [18, 19]. Such concerns may be particularly salient for youth, who are often still dependent on families for both emotional and financial support and may be motivated by a strong desire to fit in with their peers. Issues of disclosure and acceptance related to HIV can be heavy burdens that affect engagement and retention in care, medication adherence as well as overall attention to healthful living among youth, including minority YMSM [20–22].

The Disclosure Processes Model posits that disclosure behavior is explained by antecedent goals that affect disclosure likelihood and outcomes [6]. Those with approach goals seek to achieve positive outcomes by disclosing HIV status such as strengthening relationships while those with avoidance goals wish to avoid negative outcomes such as social rejection or relationship conflict. Compared to those with avoidance goals, those with approach goals may be more likely to disclose HIV status and experience positive outcomes upon disclosure. For racial/ethnic minority YMSM, there may be unique factors that influence whether HIV disclosure goals are approach or avoidance based.

Disclosure of sexual orientation is one factor that may influence HIV disclosure goals among racial/minority YMSM. For MSM, HIV status disclosure is more likely when the sexual orientation of the man disclosing is already known [23–25]. However, same-sex relationships are often stigmatized within communities of color and racial/ethnic minority MSM are less likely than White MSM to disclose their sexual orientation [7, 8, 26]. Because disclosure of HIV status may reveal one's sexual orientation, those racial/ethnic minority YMSM who have not disclosed their sexual orientation may be more likely to avoid HIV disclosure.

Approach versus avoidance disclosure goals are also likely influenced by the perceived receptivity of the person to whom HIV status is being disclosed. For many gay youth, same gender sexual behavior is often not acknowledged or is explicitly criticized within their families of origin [27, 28]. However, prior studies have found that mothers are often more accepting of their son's sexual orientation than fathers [24, 29–31]. In one study, significantly more young gay/bisexual MSM reported disclosing their sexual orientation to their mothers compared to their fathers (78 vs. 58 %, respectively) [24]. Young MSM may be more likely to disclose their HIV status to mothers due to greater acceptance of sexual orientation among mothers compared to fathers [29, 30]. More broadly, HIV-positive youth and adults have been found to be more likely to disclose HIV status to female versus male relatives [23, 32–37], which may also reflect gender differences in receptivity to HIV disclosure. Among adult MSM, higher rates of disclosure to friends than family have been reported [32] which may be due to the belief that peer group members are more likely to be accepting and supportive upon disclosure. While these studies indicate that perceived receptivity of HIV status disclosure may influence disclosure behavior, there is a gap in our understanding of the process and experience of disclosure for minority YMSM.

Although research to date has not identified a consistent and direct relationship between disclosure to sex partners and lowered risk behaviors [6], some studies in HIV-positive adults have found that disclosure to sexual partners can be an important part of reducing HIV transmission risks, including increasing condom use behaviors [4, 9, 10, 19, 20, 32, 38]. The Disclosure Processes Model posits that disclosure may affect sexual risk behavior because information shared about HIV serostatus may change perceptions of sexual risk among the discloser and sexual partner and thus lead to changes in risk behavior. While there is evidence that supports this linkage among adults living with HIV [4, 9, 10, 19, 20, 32, 38], there is a dearth of literature examining the association between disclosure to sex partners and HIV risk behaviors among young minority MSM. In order to design effective secondary prevention interventions for minority YMSM, a greater understanding of the relationship between disclosure and sexual risk behaviors among this population is needed.

To inform the development of future secondary prevention interventions, we explored disclosure of HIV status and how disclosure varied according to different relationships (e.g. family vs. friends) within a sample of racial/ethnic minority YMSM. We also examined the relationship between disclosure to sexual partners and engagement in condom use among racial/ethnic minority YMSM.

Methods

Study Participants

To address the medical care needs of this under-served population, in 2005, the Health Research and Services

administration (HRSA) created the YMSM of color initiative. The focus of the initiative was to provide outreach to HIV-positive racial/ethnic minority YMSM, link them to and retain them in HIV-related care. A total of 362 participants were enrolled at eight sites (Bronx, NY; Chapel Hill, NC; Chicago, IL; Detroit, MI; Houston, TX; Los Angeles, CA; Oakland, CA; and Rochester, NY). Each site implemented its own innovative outreach, linkage, and retention strategies, yet all sites used similar enrollment criteria and had participants complete the same baseline and follow-up surveys. Methods for this study have been described elsewhere [11–13]. Interventions at the sites varied based on local program design. To be eligible for this study, participants had to be: (a) male (biologically), (b) HIV seropositive (not currently in care)—this includes men who were newly diagnosed with HIV or those who had been out of HIV care for at least 6 months, (c) a male who had sex with males or had intent/wish to have sex with males, (d) self-identified as non-white and non-heterosexual, (e) between 13 and 24 years at the time of the baseline interview, and (f) able to provide written informed assent or consent. All sites except one were granted a waiver of parental consent. One site required parental consent from youth under 18 if they were not emancipated minors. Of the three youth <18 enrolled at this site, only one youth required parental consent. For the purpose of this study, not currently in care was defined as not having had an HIV-related medical provider visit within the past 6 months.

Procedures

Eight study sites and one evaluation center were funded to conduct local evaluations and a multisite evaluation, and these data are presented elsewhere [11–13]. The eight sites used a common data collection tool and common eligibility requirements to allow for cross-site comparisons. De-identified data collected from the sites were entered into a secure web-based data entry portal maintained by The George Washington University Evaluation and Technical Assistance Center, who served as evaluation center and analyzed the pooled data for the eight sites. Eligible participants were administered a standardized face-to-face interview by local study staff. Interviewers at all sites were extensively trained and periodically monitored in order to minimize inter- and intra-interviewer bias. Interviewer training also focused on building rapport with participants and making them feel comfortable throughout the interview, thereby reducing social desirability bias (over-reporting condom use, under-reporting number of sex partners, etc.). Baseline and 6 month follow-up data collected between June 1, 2006 and August 31, 2009 were analyzed. All instruments and protocols were approved by local Institutional Review Boards (IRBs) and The George Washington University IRB.

Measures

The interview questionnaire was adapted from standardized tools used in previous studies, to fit the population of interest.

Serostatus Disclosure

Youth participating in the study were asked at baseline and 6 month follow-up to report the persons to whom they had disclosed their serostatus. Participants were presented with a list that included: mother, father, sister, brother, other relatives, friend, steady boyfriend, steady girlfriend, sex partner, teacher, advisor at school, employer, clergy, and an "other, specify" option. Participants were also asked who they wanted to tell they were HIV-positive but had not yet done so and why. A steady boyfriend/girlfriend was defined as someone whom the participant identified as their main or primary partner. Sex partner was defined as someone the participant engaged in sex with in the past 3 months but would not consider a primary or steady partner. The disclosure questions above were specifically designed for this study.

Condom Use Behaviors

Participants were asked if they had engaged in insertive oral, receptive oral, insertive anal, or receptive anal sex in the last 3 months. Condom use during the last sexual encounter was assessed individually for each reported behavior. If they were the insertive partner, they were asked if they had used a condom. If they were the receptive partner, they were asked if their sexual partner had used a condom. Questions related to sexual behavior were adapted from the work of Diaz et al. [14].

Statistical Analysis

For new-to-care participants, three sites (Bronx, NY; Chapel Hill, NC; and Rochester, NY) enrolled youth who were diagnosed with HIV within the past 6 months; one site (Chicago, IL) enrolled youth diagnosed within the past 3 months; one site (Oakland, CA) only enrolled youth who had been newly diagnosed within 30 days and three sites enrolled all youth who had never been in care (Detroit, MI; Houston, TX; Los Angeles, CA). Six sites (Bronx, NY; Chapel Hill, NC; Detroit, MI; Los Angeles, CA; Oakland, CA; and Rochester, NY) also enrolled youth who were not new-to-care but had received either intermittent or no care for at least 6 months.

Baseline and 6 month follow-up surveys were conducted. A follow-up visit that occurred within 2 months either before or after the participant's exact 6 month

follow-up visit was included. Univariate and bivariate analyses were used to describe participants and potential confounders. Generalized estimating equations (GEE) with autoregressive correlation matrices and robust estimators of variance were used for all multivariable analyses. These models investigated increases in the prevalence of participants' disclosure of HIV status (*dependent variable*) to sex partners/steady boyfriends from baseline to 6 month follow-up, and its independent association with condom use during sex. Within adjusted models, site was included as a covariate in order to control for the different intervention strategies employed by each site, which could have included activities to promote disclosure. All analyses were performed in SAS Version 9.2 (SAS Institute, Cary, NC).

Results

Descriptive Statistics

The cohort consisted of 362 racial/ethnic minority YMSM. Two-thirds of the sample (66.6 %) identified as Black, 21.5 % as Latino and 11.9 % as multiracial. The mean age was 20.4 years (SD = 1.94, range = 15–24). Most of the sample identified as gay (63.8 %), or bisexual (19.9 %). Two-thirds ($n = 244$) of the sample was never previously in care, while one-third ($n = 118$) reported prior care experiences (Table 1). All youth enrolled in this study were behaviorally infected, and only five (1.4 %) identified as a non-heterosexual male who had the intent/wish to have sex with males but did not report any lifetime history of sex with men.

Table 1 Baseline characteristics of racial/ethnic minority HIV-infected young men who have sex with men ($n = 362$)

	n (%)
Age (years) (mean, SD)	20.4 (1.9)
Ethnicity	
African–American	241 (66.6)
Hispanic	78 (21.5)
Multiracial/other[a]	43 (11.9)
Education	
Some HS or less	105 (29.0)
HS or GED	101 (27.9)
Some college or more	156 (43.1)
Time since diagnosis, days (median, IQR)	103 (41–422)
Sexual identity	
Homosexual/gay	231 (63.8)
Bisexual	72 (19.9)
Other[b]	59 (16.3)
Comfort with sexual identity	
Very comfortable	196 (58.2)
Comfortable	118 (35.0)
Uncomfortable	20 (5.9)
Very uncomfortable	3 (0.9)
Substance use	
Alcohol (last 2 weeks)	121 (47.1)
Marijuana (last 3 months)	173 (61.8)
Other recreational drug use	149 (45.0)
CES-D score (mean, SD)	18.3 (12.0)
Care experience	
Never in care	244 (67.4)
Previously in care[c]	118 (32.6)

[a] *Multiracial* African–American and Caucasian, African–American and Latino, African–American and Native American, and three or more race/ethnicities

[b] *Other* two-spirited, bi-special, queer, trisexual, multiple identities, I'm me, don't identify/label, DL, don't know/deciding and God's child

[c] Includes those who had been out of HIV-related care for at least 6 months

Baseline Disclosure Rates

Rates of disclosure in the cohort were high, with 97.0 % disclosing their status to at least one person at baseline (Table 2). The majority had disclosed to a family member (76.5 %), with higher disclosure rates to female relatives compared with males: mother versus father (53.6 vs. 24.3 %; $p < 0.0001$) and sister versus brother (30.7 vs. 23.5 %; $p < 0.0001$). There were no differences in overall disclosure rates by race/ethnicity. However, multiracial and Black YMSM were more likely to disclose to steady boyfriends as compared to Latino YMSM ($p = 0.003$). Participants who disclosed their HIV status to their mothers were significantly more likely to have also disclosed to their fathers ($p = <0.0001$) (OR = 19.8; 95 % CI: 8.34, 46.9). Participant age and mean length of time since their HIV diagnosis were not associated with disclosure with the exception that youth who had been infected for a longer time period were more likely to have disclosed their serostatus to their friends ($p = 0.05$) and their brothers ($p = 0.007$) at baseline (Table 2).

When asked who they wanted to tell they are HIV-positive but had not told yet, one-third of participants reported wanting to disclose to one or more family members (mainly mothers), but did not want their own health issues to be a burden on their family. In contrast, 43.4 % ($n = 157$) indicated that there was no one else to whom they wished to disclose their HIV status. Among those who reported no one, 20.4 % ($n = 32$) had already told all the people that they wanted to tell, 10.2 % ($n = 16$) did not feel like it was anyone else's business, and 14.0 % reported that they were still dealing with the diagnosis themselves. A small number of participants 3.8 % ($n = 6$) reported feeling so alone that they had no one to tell. The majority

Table 2 Baseline HIV disclosure rates by race/ethnicity and by diagnosis time (newly diagnosed vs. re-engaging in care)

	Overall $N = 362$	Race/Ethnicity			p value	Diagnosis time		p value
		Black $N = 241$	Latino $N = 78$	Multiracial $N = 43$		Newly diagnosed $N = 244$	Re-engaged in care $N = 118$	
Any family member	277 (76.5 %)							
Mother	194 (53.6 %)	139 (57.7 %)	33 (42.3 %)	22 (51.2 %)	0.06	130 (53.3 %)	64 (54.2 %)	0.86
Father	88 (24.3 %)	60 (24.9 %)	15 (19.2 %)	13 (30.2 %)	0.38	54 (22.1 %)	34 (28.8 %)	0.16
Sister	111 (30.7 %)	70 (29.1 %)	24 (30.8 %)	17 (39.5 %)	0.39	73 (29.9 %)	38 (32.2 %)	0.66
Brother	85 (23.5 %)	52 (21.6 %)	21 (26.9 %)	12 (27.9 %)	0.48	47 (19.3 %)	38 (32.2 %)	0.01
Other relatives[a]	133 (36.7 %)	90 (37.3 %)	23 (29.5 %)	16 (37.2 %)	0.44	83 (34.0 %)	46 (39.0 %)	0.36
Steady boyfriends[b]	120 (33.1 %)	79 (32.8 %)	18 (23.1 %)	23 (53.5 %)	0.003	78 (32.0 %)	42 (35.6 %)	0.49
Sex partners[c]	84 (23.2 %)	51 (21.2 %)	17 (21.8 %)	10 (23.3 %)	0.95	46 (18.9 %)	32 (27.1 %)	0.07
Friends	218 (60.2 %)	137 (56.9 %)	50 (64.1 %)	26 (60.5 %)	0.51	135 (55.3 %)	78 (66.1 %)	0.05
No one	11 (3.0 %)	8 (3.3 %)	3 (3.9 %)	0 (0 %)	0.45	6 (2.5 %)	5 (4.2 %)	0.35

[a] Grandparents, aunts, uncles, cousins, god-relatives, nephew, stepparents, brother-in-law

[b] At baseline there were 222 men (64.5 %) who had a steady male partner

[c] Includes both past and present sex partners

($n = 81$, 51.6 %) of those answering "no one" did not indicate a specific reason why they did not want to disclose to anyone else.

Disclosure Over Time

Overall, 292 (80.7 %) participants had at least 6 months of possible follow-up (enrolling on or before February 28, 2009). Among 173 young men (59.2 %) who completed both their baseline and 6 month follow-up interviews (Table 3), there was a statistically significant increase in disclosure to mothers (56.7 % at baseline vs. 61.9 % at follow-up; $p = 0.047$), fathers (23.7 % at baseline vs. 30.1 % at follow-up; $p = 0.015$), sisters (31.8 % at baseline vs. 39.3 % at follow-up; $p = 0.014$), and brothers (27.2 % at baseline vs. 33.5 % at follow-up; $p = 0.046$) between the baseline and follow-up. Disclosure to steady boyfriends increased over time and approached statistical significance ($p = 0.057$).

Disclosure to Sexual Partners Over Time and Condom Use Behaviors

After adjustment for site, disclosure to sex partners and steady boyfriends was associated with an increase in condom use during oral sex ($p = 0.027$), insertive anal sex ($p = 0.005$) and receptive anal sex ($p = 0.003$). Participants who disclosed their HIV status to their sex partners between baseline and 6 months were 1.87 times more likely to have used a condom during the last episode of insertive anal sex and 1.79 more likely to have used a condom during the last episode of receptive anal sex compared to those who did not disclose (Table 4).

Discussion

In this study of racial/ethnic minority YMSM we found high rates of disclosure overall. This is a very encouraging finding in light of barriers, such as stigmatization of same-sex relationships in communities of color, that minority YMSM may face in their decisions about disclosure. We found higher rates of disclosure to family members (75 %) compared to friends (60 %) which differs from studies of adult MSM living with HIV, who have been found to disclose to friends more than family [39]. This difference may be partially explained by age. As youth, their primary emotional relationships may still be with their families and, for some, the level of trust needed to disclose their status to friends may not yet be developed. Similar to other studies of both youth and adults who were more likely to disclose to female versus male relatives [33, 34, 39–43], we found higher rates of disclosure to sisters compared to brothers, and mothers compared to fathers. This may reflect previous findings that mothers are often more accepting of their son's sexual orientation than fathers [35, 36].

In general, the level of parental disclosure in this study is encouraging. More than three-quarters of our youth (76.5 %) had disclosed their HIV status to at least one family member. This is particularly important given that 36.2 % of our sample were non-gay identified youth and the decision to disclose one's HIV status is often more complex for young MSM who are not already "out" to their family. Disclosure to parents may result in their availability for family-based interventions that promote adherence to care appointments and antiretroviral therapy and to support the overall health and wellness of the youth. Parents can serve as a source of support and buffer the

Table 3 Disclosure of HIV status over time (baseline and 6 month follow-up)

	Who have you told that you are HIV-positive?			Who do you want to tell that you are HIV-positive but haven't told yet?		
	Baseline	6 month	*p* value	Baseline	6 month	*p* value
Mother	98 (56.7 %)	107 (61.9 %)	0.047	34 (20.1 %)	24 (14.4 %)	0.02
Father	41 (23.7 %)	52 (30.1 %)	0.015	12 (7.1 %)	8 (4.8 %)	0.21
Sister	55 (31.8 %)	68 (39.3 %)	0.014			
Brother	47 (27.2 %)	58 (33.5 %)	0.046			
Siblings	–			13 (7.7 %)	10 (6.0 %)	0.51
Other relatives[a]	56 (32.4 %)	65 (37.6 %)	0.20	21 (12.4 %)	11 (6.6 %)	0.03
Steady boyfriends	58 (33.5 %)	74 (42.8 %)	0.057	8 (2.3 %)	1 (1.8 %)	0.32
Friends	113 (65.3 %)	107 (61.9 %)	0.38	19 (11.2 %)	11 (6.6 %)	0.09
Sex partners (past and present)	40 (23.1 %)	49 (28.3 %)	0.21	15 (8.9 %)	8 (4.8 %)	0.11
No one	0 (0 %)	0 (0 %)	–	71 (42.0 %)	99 (59.3 %)	<0.0001

[a] Grandparents, aunts, uncles, cousins, god-relatives, nephew, stepparents, brother-in-law

Table 4 Comparison of risk behaviors among those who disclosed their HIV status to sex partners/boyfriends, to those who did not disclose from baseline to 6 months follow-up, $n = 173$

	Baseline *N* (%) M (SD)	Follow-up *N* (%) M (SD)	*p* value	Unadjusted comparison (disclosers vs. non-disclosers) OR (95 % CI); *p* value	Adjusted comparison[a] OR (95 % CI); *p* value
Last 3 months				Disclosure to sex partners/boyfriends	
Condom use during oral sex ($n = 109$)	33 (30.3 %)	50 (45.9 %)	0.066	1.22 (1.06, 1.41)	1.18 (1.02, 1.36)
				$p = 0.007$	$p = 0.027$
Condom use during insertive anal sex ($n = 72$)	56 (77.8 %)	57 (79.2 %)	0.45	1.87 (1.20, 2.91)	1.87 (1.20, 2.90)
				$p = 0.006$	$p = 0.005$
Condom use during receptive anal sex ($n = 92$)	61 (66.3 %)	74 (80.4 %)	0.89	1.72 (1.16, 2.53)	1.79 (1.21, 2.64)
				$p = 0.006$	$p = 0.003$

[a] Adjusted for site

negative effects of stigma and harassment experienced by the youth outside the home or serve as a further source of stress by perpetuating homophobic views and discrimination and leaving the youth with no true "safe space".

Previous studies have reported that discussions on sensitive topics including sexual orientation and HIV serostatus are greatly influenced by cultural background [23, 37]. Among behaviorally infected adolescents, Hispanic ethnicity has been associated with higher rates of disclosure to mothers [33]. While not statistically significant ($p = 0.058$), we found that Hispanic YMSM in this study were less likely to disclose to their mothers compared with Black and multiracial YMSM. The differences could be explained by the fact that the aforementioned study consisted primarily of female adolescents, while ours focused only on YMSM who often face complex familial and cultural expectations that likely affect disclosure of both sexuality and HIV [29, 30, 37].

Among HIV-infected adults, many factors have been identified that may be barriers to disclosure, including fear of discrimination, anticipated disruption of relationships, a desire to protect oneself and others emotionally as well as the potential repercussions of verbal or physical abuse [44]. While some of the reasons for nondisclosure mentioned in this cohort included concern for potential social rejection and discrimination by others, many of the young men were reluctant to disclose out of genuine worry that the news would have a negative impact on the health and well being of their family members. This concern for others' welfare above their own extends the findings of another recent study of young gay men who reported that a compelling reason for them to engage in safer sex behavior was the desire to stay healthy for their parents [24].

While disclosure can be associated with negative outcomes, individuals who fail to disclose can miss the positive effects that post-disclosure support has on their health

and well being [22, 39]. Decisions about whom to disclose to continue over time rather than being a one-time full disclosure to everyone [31]. For those youth evaluated longitudinally, we saw an evolving process of disclosure over time with disclosure increasing to members of their immediate family but no significant change for extended family, sex partners or friends. Importantly, the percentage of young men reporting that there was no one else they wanted to disclose to increased over time ($p < 0.0001$). While not directly measured in this study, it is possible that the increase in disclosure to members of their immediate family was related to participants increasing age, comfort with their own sexuality, and improvement in their confidence levels and maturity. Importantly, increased disclosure to sexual partners was associated with an increase in condom use. This finding is consistent with studies of adult MSM [27, 28, 32]. However, unprotected sex with and without serostatus disclosure still occurred, with more than 20 % of the sample reporting unprotected anal intercourse at 6 month follow-up. Thus, while prevention of transmission of HIV to uninfected individuals may result after status disclosure, a comprehensive secondary prevention intervention should combine both behavioral and biomedical components to be most successful [25]. Providers should consider offering additional skills training to assist youth in the disclosure process, facilitate how to determine who in their family and friend social network can be safely disclosed to and provide them with materials to educate friends and family about the disease and transmission. While none of the sites had interventions that specifically targeted disclosure, different activities could have impacted results. For instance four of the sites provided clients with individual-level behavioral change interventions.

Although the study presents new findings on disclosure and the relationship of disclosure to condom use behavior among minority YMSM, there are some limitations. Information on when in the context of the relationship or sexual encounter the disclosure occurred is lacking, as the data collected was partner-based not episode-based. Moreover, we did not collect partner-specific data regarding race, age, or serostatus, and there could have been selective disclosure based on any or all of these characteristics. Disclosure behaviors and sexual behaviors are potentially different between those who are newly diagnosed and those who have been diagnosed for a longer period of time. The fact that we relied on self-report of disclosure and that 6 month follow-up data was only available for 59 % of the sample likely resulted in an overestimate of disclosure rates in this population. As we only included youth who remained engaged in HIV care at 6 months our study was not able to investigate any interaction between disclosure to family and friends and engagement. Since only one site required parental consent for non-emancipated minors we do not feel this introduced significant bias into this sample. As with all interviewer-administered surveys, participant responses were prone to several sources of bias, including recall bias, social desirability bias, and interviewer bias. All survey questions were time-anchored and asked participants to recall their last sexual encounter or activities in the prior 3 months. This minimized the potential for recall bias by having the participant focus on recent events, rather than on lifetime events. While use of a method of interviewing to reduce bias such as a computer-assisted survey would have been optimal, cost considerations precluded this.

Despite these limitations, these findings significantly contribute to the literature to date, in which there is little research investigating disclosure patterns over time and the relationship between disclosure to sexual partners and sexual risk behaviors among racial/ethnic minority YMSM. There is a dearth of prospective research on young MSM in general and this study represents the largest and most geographically diverse sample of HIV-positive racial/ethnic minority YMSM to date. In light of recent reports of the continued rise of HIV among this population [45] supportive family-based interventions should be a future focus.

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References

1. Valleroy LA, MacKellar DA, Karon JM, Rosen DH, McFarland W, Shehan DA, et al. HIV prevalence and associated risks in young men who have sex with men. Young Men's Survey Study Group. JAMA. 2000;284(2):198–204.

2. CDC. HIV prevalence, unrecognized infection and HIV testing among men who have sex with men—Five US cities, June 2004–April 2005. MMWR. 2005;54:597–601.
3. Millett GA, Crowley JS, Koh H, Valdiserri RO, Frieden T, Dieffenbach CW, et al. A way forward: the National HIV/AIDS Strategy and reducing HIV incidence in the United States. J Acquir Immune Defic Syndr. 2010;55(Suppl 2):S144–7.
4. Crepaz N, Marks G. Serostatus disclosure, sexual communication and safer sex in HIV-positive men. AIDS Care. 2003;15(3):379–87.
5. Gorbach PM, Galea JT, Amani B, Shin A, Celum C, Kerndt P, et al. Don't ask, don't tell: patterns of HIV disclosure among HIV positive men who have sex with men with recent STI practising high risk behaviour in Los Angeles and Seattle. Sex Transm Infect. 2004;80(6):512–7.
6. Chaudoir SR, Fisher JD, Simoni JM. Understanding HIV disclosure: a review and application of the Disclosure Processes Model. Soc Sci Med. 2011;72(10):1618–29.
7. Ostrow DG, Whitaker RE, Frasier K, Cohen C, Wan J, Frank C, et al. Racial differences in social support and mental health in men with HIV infection: a pilot study. AIDS Care. 1991;3(1):55–62.
8. Kennamer JD, Honnold J, Bradford J, Hendricks M. Differences in disclosure of sexuality among African American and White gay/bisexual men: implications for HIV/AIDS prevention. AIDS Educ Prev. 2000;12(6):519–31.
9. Parsons JT, Schrimshaw EW, Bimbi DS, Wolitski RJ, Gomez CA, Halkitis PN. Consistent, inconsistent, and non-disclosure to casual sexual partners among HIV-seropositive gay and bisexual men. AIDS. 2005;19(Suppl 1):S87–97.
10. De Rosa CJ, Marks G. Preventive counseling of HIV-positive men and self-disclosure of serostatus to sex partners: new opportunities for prevention. Health Psychol. 1998;17(3):224–31.
11. Magnus M, Jones K, Phillips G 2nd, Binson D, Hightow-Weidman LB, Richards-Clarke C, et al. Characteristics associated with retention among African American and Latino adolescent HIV-positive men: results from the outreach, care, and prevention to engage HIV-seropositive young MSM of color special project of national significance initiative. J Acquir Immune Defic Syndr. 2010;53(4):529–36.
12. Hightow-Weidman LB, Jones K, Phillips G, Giordano TP, YMSM of color SPNS initiative study group. Baseline clinical characteristics, antiretroviral therapy use, and viral load suppression among HIV-positive young men of color who have sex with men. AIDS Patient Care STDS. 2011;25:S9–14.
13. Hightow-Weidman LB, Jones K, Wohl AR, Futterman D, Outlaw A, Phillips G, et al. Early linkage and retention in care: findings from the outreach, linkage, and retention in care initiative among young men of color who have sex with men. AIDS Patient Care STDS. 2011;25:S31–8.
14. Diaz RM, Ayala G, Bein E. Sexual risk as an outcome of social oppression: data from a probability sample of Latino gay men in three U.S. cities. Cult Divers Ethn Minor Psychol. 2004;10(3):255–67.
15. Bird JD, Fingerhut DD, McKirnan DJ. Ethnic differences in HIV-disclosure and sexual risk. AIDS Care. 2011;23(4):444–8.
16. Simbayi LC, Kalichman SC, Strebel A, Cloete A, Henda N, Mqeketo A. Disclosure of HIV status to sex partners and sexual risk behaviours among HIV-positive men and women, Cape Town. South Africa. Sex Transm Infect. 2007;83(1):29–34.
17. Sullivan KM. Male self-disclosure of HIV-positive serostatus to sex partners: a review of the literature. J Assoc Nurses AIDS Care. 2005;16(6):33–47.
18. Simoni JM, Pantalone DW. HIV disclosure and safer sex. In: Kalichman SC, editor. Positive prevention: Reducing HIV transmission among people living with HIV/AIDS. New York: Kluwer Academic/Plenum Publishers; 2004. p. 65–98.
19. Simoni JM, Pantalone DW. Secrets and safety in the age of AIDS: does HIV disclosure lead to safer sex? Top HIV Med. 2004;12(4):109–18.
20. Kalichman SC, Nachimson D. Self-efficacy and disclosure of HIV-positive serostatus to sex partners. Health Psychol. 1999;18(3):281–7.
21. Remien RH, Exner TM, Morin SF, Ehrhardt AA, Johnson MO, Correale J, et al. Medication adherence and sexual risk behavior among HIV-infected adults: implications for transmission of resistant virus. AIDS Behav. 2007;11(5):663–75.
22. Wohl AR, Galvan FH, Myers HF, Garland W, George S, Witt M, et al. Do social support, stress, disclosure and stigma influence retention in HIV care for Latino and African American men who have sex with men and women? AIDS Behav. 2011;15(6):1098–110.
23. Kanuha VK. The impact of sexuality and race/ethnicity on HIV/AIDS risk among Asian and Pacific Island American (A/PIA) gay and bisexual men in Hawai'i. AIDS Educ Prev. 2000;12(6):505–18.
24. LaSala MC. Parental influence, gay youths, and safer sex. Health Soc Work. 2007;32(1):49–55.
25. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, et al. Prevention of HIV-1 infection with early antiretroviral therapy. N Engl J Med. 2011;365(6):493–505.
26. CDC. HIV/STD risk in young men who have sex with men who do not disclose their sexual orientation—Six U.S. cities, 1994–2000. MMWR. 2003;52:81–5.
27. Chen SY, Gibson S, Weide D, McFarland W. Unprotected anal intercourse between potentially HIV-serodiscordant men who have sex with men, San Francisco. J Acquir Immune Defic Syndr. 2003;33(2):166–70.
28. Golden MR, Brewer DD, Kurth A, Holmes KK, Handsfield HH. Importance of sex partner HIV status in HIV risk assessment among men who have sex with men. J Acquir Immune Defic Syndr. 2004;36(2):734–42.
29. Estrada F, Rigali-Oiler M, Arciniega GM, Tracey TJ. Machismo and Mexican American men: An empirical understanding using a gay sample. J Couns Psychol. 2011;58(3):358–67.
30. Meyer MA, Champion JD. Protective factors for HIV infection among Mexican American men who have sex with men. J Assoc Nurses AIDS Care. 2010;21(1):53–62.
31. Obermeyer CM, Baijal P, Pegurri E. Facilitating HIV disclosure across diverse settings: a review. Am J Public Health. 2011;101(6):1011–23.
32. Klitzman R, Exner T, Correale J, Kirshenbaum SB, Remien R, Ehrhardt AA, et al. It's not just what you say: relationships of HIV dislosure and risk reduction among MSM in the post-HAART era. AIDS Care. 2007;19(6):749–56.
33. D'Angelo LJ, Abdalian SE, Sarr M, Hoffman N, Belzer M. Disclosure of serostatus by HIV infected youth: the experience of the REACH study. Reaching for excellence in adolescent care and health. J Adolesc Health. 2001;29(3 Suppl):72–9.
34. Wolitski RJ, Rietmeijer CA, Goldbaum GM, Wilson RM. HIV serostatus disclosure among gay and bisexual men in four American cities: general patterns and relation to sexual practices. AIDS Care. 1998;10(5):599–610.
35. Garofalo R, Mustanski B, Donenberg G. Parents know and parents matter; is it time to develop family-based HIV prevention programs for young men who have sex with men? J Adolesc Health. 2008;43(2):201–4.
36. Savin-Williams RC. The Disclosure to Families of Same-Sex Attractions by Lesbian, Gay and Bisexual Youths. J Res Adolesc. 1998;8(1):49–68.

37. Zea MC, Reisen CA, Poppen PJ, Echeverry JJ, Bianchi FT. Disclosure of HIV-positive status to Latino gay men's social networks. Am J Community Psychol. 2004;33(1–2):107–16.
38. Marks G, Crepaz N. HIV-positive men's sexual practices in the context of self-disclosure of HIV status. J Acquir Immune Defic Syndr. 2001;27(1):79–85.
39. Kalichman SC, DiMarco M, Austin J, Luke W, DiFonzo K. Stress, social support, and HIV-status disclosure to family and friends among HIV-positive men and women. J Behav Med. 2003;26(4):315–32.
40. Hays RB, McKusick L, Pollack L, Hilliard R, Hoff C, Coates TJ. Disclosing HIV seropositivity to significant others. AIDS. 1993;7(3):425–31.
41. Marks G, Bundek NI, Richardson JL, Ruiz MS, Maldonado N, Mason HR. Self-disclosure of HIV infection: preliminary results from a sample of Hispanic men. Health Psychol. 1992;11(5):300–6.
42. Mansergh G, Marks G, Simoni JM. Self-disclosure of HIV infection among men who vary in time since seropositive diagnosis and symptomatic status. AIDS. 1995;9(6):639–44.
43. Stempel RR, Moulton JM, Moss AR. Self-disclosure of HIV-1 antibody test results: the San Francisco General Hospital Cohort. AIDS Educ Prev. 1995;7(2):116–23.
44. Chandra PS, Deepthivarma S, Manjula V. Disclosure of HIV infection in south India: patterns, reasons and reactions. AIDS Care. 2003;15(2):207–15.
45. Prejean J, Song R, Hernandez A, Ziebell R, Green T, Walker F, et al. Estimated HIV Incidence in the United States, 2006–2009. PLoS ONE. 2011;6(8):e17502.