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Personal and contextual factors related to delayed HIV diagnosis among men who have sex with men

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Abstract

Delayed HIV diagnosis among men who have sex with men (MSM) in the United States continues to be a significant personal and public health issue. Using qualitative and quantitative data from 75 recently tested, HIV-seropositive MSM (38 delayed and 37 non-delayed testers) we sought to further elucidate potential personal and contextual factors that may contribute to delayed HIV diagnosis among MSM. Our findings indicate MSM who experience multiple life stressors, whether personal or contextual, have an increased likelihood of delaying HIV diagnosis. Further, MSM experiencing multiple life stressors without the scaffolding of social support, stable mental health, and self-efficacy to engage in protective health behaviors may be particularly vulnerable to delaying diagnosis. Interventions targeting these factors as well as structural interventions targeting physiological and safety concerns are needed to help MSM handle their life stressors more effectively and seek HIV testing in a timelier manner.

Keywords

MSM; HIV/AIDS; HIV testing; delayed diagnosis; delayed testing

Introduction

Men who have sex with men (MSM) remain the group most affected by HIV in the United States (U.S.), accounting for approximately 63% of all new HIV infections and 52% of all persons living with HIV (Centers for Disease Control and Prevention [CDC], 2012a, 2012b). Among MSM living with HIV it has been estimated that, depending on their race/ethnicity,

19%-26% are unaware of their HIV infection (Chen et al., 2012). The CDC has routinely suggested at least annual HIV screening for sexually active MSM (Branson et al., 2006); however, results from the National HIV Behavioral Surveillance System in 21 cities indicated that 53% of the 680 MSM who tested HIV-seropositive as a part of the study had previously tested more than 12 months prior to diagnosis or had never tested before (CDC, 2011).

In the past few years there has been a growing interest in the “treatment cascade” and implications for HIV prevention related to attrition at each step (Mugavero, Amico, Horn, & Thompson, 2013). The “treatment cascade” starts with estimates of prevalent HIV cases, with successive bars illustrating the subsequent steps of HIV diagnosis, linkages to care, retention in care, antiretroviral therapy receipt, and plasma viral suppression. People who are HIV-seropositive but remain undiagnosed are unable to receive the care and treatment they need to slow disease progression and prevent transmission. Early diagnosis of HIV has significant personal and public health benefits. Diagnosis early in disease progression increases survival, improves health outcomes, and decreases health care costs (Chadborn, Delpech, Sabin, Sinka, & Evans, 2006; Hogg et al., 2001; Krentz, Auld, & Gill, 2004; Sterling, Chaisson, Keruly, & Moore, 2003).

Delayed diagnosis among MSM has additional implications for disease progression and transmission prevention. MSM who are unaware of their infection are more likely to engage in sexual risk-taking (Marks, Crepaz, Senterfitt, & Janssen, 2005), placing others at risk for acquiring HIV, themselves at risk for contracting other sexually transmitted infections (STIs), weakening their already compromised immune systems (Wiley et al., 2000), and increasing the potential for superinfection with multiple strains of HIV (Sidat et al., 2008). Additionally, a recent study evaluating the primary drivers of the continued HIV epidemic among MSM estimated that 24-31% of new HIV infections among MSM can be attributed to having sex with partners who are unaware of their HIV infection (Goodreau et al., 2012).

Increasing attention in the HIV risk-taking literature is being paid to establishing and testing HIV risk models that address not only sociodemographic risk factors, but also personal and contextual factors (Traube, Holloway, & Smith, 2011; Zea, Reisen, Poppen, & Bianchi, 2009). While this literature is primarily focused on behavioral risks for HIV acquisition or transmission, the same theoretical considerations can be taken into account when conceptualizing reasons for delayed HIV diagnosis. A theoretical approach that addresses personal and contextual factors that has received growing support in the HIV-risk literature is Social Action Theory (Ewart, 1991). Applying Social Action Theory to delayed HIV testing, one could propose that self-regulatory action (e.g., getting tested for HIV) is influenced not only by the characteristics of the person (e.g., self-efficacy to engage in protective health behaviors), but additionally by the social, physical, and affective context in which the action occurs (e.g., social support, housing, mental health status).

Sociodemographic characteristics of people with late (commonly defined as HIV diagnosis within 12 months of AIDS diagnosis) and delayed (commonly defined as HIV diagnosis one year or more after HIV infection) HIV diagnosis often have been assessed. There has been limited research addressing personal and contextual factors that may affect delayed testing

(Kozak, Zinski, Leeper, Willig, & Mugavero, 2013; MacKellar et al., 2005; Mukolo, Villegas, Aliyu, & Wallston, 2013; Nelson et al., 2010). In this manuscript we use qualitative and quantitative data from the Seattle Area MSM Study (SAMS) to conduct a preliminary assessment of potential personal and contextual factors that may contribute to delayed HIV diagnosis among MSM. Specifically we hypothesized that participants who reported increased personal and contextual stressors would be more likely to have delayed diagnosis. Stressors were conceptualized as factors that exhibit the potential to induce negative changes in the individual's psychological, physiological and immunological equilibrium (Paterson & Neufeld, 1989). To enrich our understanding of the relation between the level of stressors and delayed status we compare overall patterns of stressors between delayed versus non-delayed testers as well as provide prototypical case examples.

Method

Study Design, Eligibility, Recruitment, and Data Collection

SAMS was a cross-sectional survey of HIV risk factors among newly diagnosed HIV-seropositive and HIV-seronegative MSM conducted by the Public Health-Seattle & King County (PHSKC) HIV/AIDS Epidemiology Program under a cooperative agreement with the CDC. The study collected data from July 2002 to May 2005. Detailed descriptions of the recruitment and study procedures are provided elsewhere (Thiede et al., 2009). Briefly, potential participants were passively referred to the study after testing for HIV at the PHSKC sexually transmitted diseases (STD) and HIV/AIDS Program (HAP) clinics, HAP community outreach testing sites, and two university HIV clinics. MSM were eligible if they were age 18 or older, reported sex with men during the preceding 6 months, and were able to complete the interview in English. HIV-seropositive MSM were eligible if recruited within three months of their first HIV-seropositive test result and HIV-seronegative MSM were eligible if recruited within one month of testing. A structured quantitative survey questionnaire was administered to all participants via audio computer-assisted self-interviewing (ACASI). All HIV-seropositive and half of the HIV-seronegative participants were asked to participate in qualitative semi-structured interviews.

All interviews were audio recorded with concurrent supplementary written notes taken by the interviewer. Within a week of each interview, the interviewer would create a write-up of the interview including their notes. These write-ups would include a combination of descriptions of the substantive content of the discussion along with verbatim transcribed quotes and notes on the context of the quotes. Verbatim quotes were chosen based on their direct relation to the study goals, whereas lengthy, less relevant, or off-topic sections of the interviews were summarized by the interviewer in the write-up. This method has a long history of successful and reliable use within traditional ethnography and is an efficient way to contain write-up costs (Spradley, 1979). To validate their accuracy, write-ups were reviewed by two additional research team members. To establish and contrast factors associated with delayed and non-delayed testing we conducted a content analysis using CDC EZ-Text software (Carey et al., 2008). Two coders developed a codebook designed to identify themes in the interview write-ups (Hruschka et al., 2004). Overall, final intercoder reliability was that 85.4% of the codes had kappa values equal to or greater than 0.8. The

codes were used to identify common behavioral patterns and to search the database for the illustrative verbatim quotes presented below from the delayed and non-delayed tester samples.

During the study period all persons testing HIV-seropositive at the PHSKC sites were routinely offered the less sensitive (LS) HIV-1 test, employing the serologic testing algorithm to assess recent HIV seroconversion (STARHS), to estimate recent infection in the testing population. All tests were performed by the PHSKC Laboratory (Vironostika-LS EIA; Bio Merieux, Raleigh, NC). The estimated mean time from seroconversion (defined using a standardized optical density cutoff of 1.0) with the Vironostika-LS is 170 days (95% CI, 145–200 days; Kothe et al., 2003). To be consistent with our previous manuscript on delayed diagnosis among this population (Nelson et al., 2010), delayed testers were defined as MSM who seroconverted six months or more before testing HIV-seropositive, based on a positive HIV-1 test combined with a reactive LS HIV-1 test (according to STARHS) or, in the case of a missing LS HIV-1 test, lack of a self-reported HIV-negative test during the past six months. Non-delayed testers were defined as those with infections acquired within the preceding six months, based on a positive HIV-1 test combined with a non-reactive LS HIV-1 test (according to STARHS) or self-reported HIV-seronegative test during the past six months.

Among participants in whom we relied on self-reported last HIV-seronegative test, attempts were made to verify the date of last test by contacting the participant's medical provider or through PHSKC HIV testing records. Through this method we were able to verify the date of last HIV-seronegative result for three of the non-delayed testers. In addition, six of the non-delayed testers were verified to be recent infections due to their diagnosis with a syndrome of primary infection at an HIV clinic that specialized in diagnosis and treatment of new infections in addition to their self-reported prior HIV-seronegative tests.

Two participants had reactive LS HIV-1 results while having a self-reported HIV-seronegative test in the past six months. In these cases recency of infection was decided by the study investigators based on information the client provided in the quantitative and qualitative interviews about their testing history and usual frequency of testing. Given these participants' reported frequency of testing and the amount of details, including dates and locations, provided about their last HIV-seronegative test result, these two participants were deemed to be non-delayed testers.

Overall, quantitative and qualitative analyses were conducted on the 75 of the 77 participants who tested HIV-seropositive and had coded qualitative interview data, including 38 delayed and 37 non-delayed testers. This study was approved by the Institutional Review Boards of the University of Washington and the CDC. All participants provided informed consent.

Analysis

To create a description of our sample, chi-square and Fisher's Exact Tests were used to compare delayed and non-delayed testers with respect to sociodemographic variables. Sociodemographic variables included: recruitment site (HAP clinic, HAP outreach, STD

Clinic, and other sites), age (18-29, 30-39, 40+), race/ethnicity (white, black/African American, Hispanic, other), education (high school or less, more than high school), sexual identity (gay, bisexual), extent they had revealed their sexual practices (“out” to >50% of the people they knew about having about male-male sex, “out” to ≤50% of the people they knew about having male-male sex), and health insurance (yes/no).

To establish variables that would likely increase the level of stressors in a participant’s life, we analyzed two questions from the semi-structured interview: 1) “Before you found out your HIV results, had anything big happened in your life in the last year? For example, did you move, lose or start a job, did a relationship end or begin, etc.” and 2) “Do you have any history of depression or other mental health issues?” All participants were asked these questions with additional specific probes to further engage the participant as necessary. For example, for the question “Before you found out your HIV results, had anything big happened in your life in the last year?” the probes included: 1) “Was there anything from before a year ago that had a bigger impact for you?”; 2) “What happened?”; 3) “Where did it happen?”; 4) “When did it happen?”; 5) “How did it happen?”; 6) “Who was there?”; 7) “How did you deal with this?”; 8) “What helped you cope?”; and 9) “How did things work out?”

Four main variables in the qualitative data were hypothesized to increase the level of stressors in a participant’s life. These included any experiences of violence (yes/no), relationship issues (yes/no), or substance use issues (yes/no) in the past 12 months and a self-reported history of hospitalization for mental illness (yes/no). Participants were coded as having experienced violence if they reported: 1) doing something violent, acting out, or being malicious; 2) being physically abused or hurt; 3) being sexually abused, molested, or raped; or 4) being verbally or emotionally abused or hurt in the past 12 months. Relationship issues were defined as participants who self-reported experiencing significant events in their romantic, family, or friendship relationships (e.g. starting a new relationship, ending a relationship, relationship conflict) in the past 12 months. Participants who self-reported increases in illicit drug or alcohol use, attempting to become sober, overdosing, and/or entering detoxification treatment or other substance use related programs in the past 12 months were coded as having substance use issues. To supplement the qualitative data we additionally identified behavioral variables in the quantitative dataset that we hypothesized would likely increase stress in participant’s lives. These included current homelessness (yes/no) and history of incarceration (yes/no). Homelessness was defined as self-reporting being homeless or having a non-permanent residence. History of incarceration was defined as self-reporting ever having spent a night in jail.

A count variable was created to represent the overall level of stressors experienced in a participant life, with a 0 corresponding to not having experienced any of the hypothesized stressors and a 6 corresponding to having experienced all of the hypothesized stressors. Participants were considered to have encountered significant stressors in their lives if they experienced 2 or more of the proposed stressors. Fisher’s Exact Tests were used to compare delayed and non-delayed testers with respect to the individual stressors and the overall stressor variable (0-1, 2+).

Overall patterns, case examples, and illustrative quotes were extracted from the qualitative data to enrich our understanding of the relation between the level of stressors and delayed status. We established four case examples: a HIV-seropositive participant who was delayed and reported 2 or more stressors, a HIV-seropositive participant who was non-delayed and reported 2 or more stressors, a HIV-seropositive participant who was delayed and reported 0-1 stressor, and a HIV-seropositive participant who was non-delayed and reported 0-1 stressor.

Results

Sample

Among the 77 HIV-positive MSM enrolled in SAMS, 75 had coded qualitative interview data, including 38 (51%) delayed and 37 (49%) non-delayed testers. As reported previously (Nelson et al., 2010), delayed testers were more likely to be older (18-29 yrs old: 21% vs. 30%, 30-39 yrs old: 29% vs. 54%, and 40+ yrs old: 50% vs. 16%, $p < .01$), black/African American (26% vs. 3%, $p < .01$), and “out” to 50% or less of the people they knew about having male-male sex (45% vs. 14%, $p < .01$) compared to non-delayed testers (Table 1).

Proposed stressors and their relation with delayed diagnosis

An analysis of the proposed stressors in the qualitative and quantitative data revealed that delayed testers were no more likely to report having experienced violence (26% vs. 19%, $p = 0.58$), relationship issues (53% vs. 51%, $p = 1.0$), or substance use issues (34% vs. 30%, $p = 0.81$) in the past twelve months; a history of hospitalization for mental illness (21% vs. 14%, $p = 0.54$); or a history of incarceration (50% vs. 30%, $p = 0.10$) compared to non-delayed testers (Table 2). Delayed testers were more likely to be homeless (32% vs. 5%, $p = 0.01$). Interestingly, while the majority of the proposed stressors were not significantly different between delayed and non-delayed testers, delayed testers were significantly more likely to have experienced two or more of the stressors (68% vs. 38%, $p = 0.01$) compared to non-delayed testers.

Upon further exploration of the narratives provided by the participants multiple patterns arose. Specifically, delayed testers with two or more life stressors often described a long history of substance use and untreated or only sporadically treated mental illness. Further they reported feeling that they felt a lack of agency of control over their own behaviors. Lastly, they reported a lack of social support and accurate appraisal of their HIV risk. In contrast, non-delayed testers with two or more life stressors described similar issues with substance use, mental health, and mental health treatment, though, non-delayed testers tended to report a sense of control and agency over their own behaviors as well as an accurate appraisal of their HIV risk.

Delayed testers with fewer than two life stressors often described no or few substance use issues; overall good mental health and/or a stable mental health treatment history; having a sense of agency over their own behaviors; and having a steady social support system. Similar to delayed testers with two or more life stressors, delayed testers with fewer than two life stressors also appeared to have an inaccurate appraisal of their own HIV risk,

often due to a false sense of security in the context of a long-term relationship. Non-delayed testers with less than two life stressors on the other hand, also reported having little-to-no substance use issues, stable mental health or mental health treatment history, a stable social support system, and a sense of agency over their own behaviors, but, in contrast to the delayed testers with less than two life stressors, they tended to be accurately aware of their own HIV risk.

Case Examples

One HIV-seropositive *delayed tester who experienced 2 or more stressors* in his life was black/African American, homeless, 30-39 year old, had a high school diploma or lower level of education, and did not have health insurance. He described himself as experiencing a lifetime of suffering from substantial alcohol use and mental health issues, including being hospitalized on multiple occasions. Further he reported having emotional and financial problems related to his alcohol use. He described spending all of his money on alcohol and being unable to afford things like housing or food. Further, he said that his drinking isolates him from his family as they do not want to be around him when he is drinking because he gets “obnoxious and smart” when he drinks.

In the year prior to testing he reported moving to the Seattle area to seek work, but remained unemployed. He described himself as sad about being away from family and overall feeling socially isolated and lonely; “I don’t have too many friends.” He reported that he has sex with men not because he wants sex, but instead as a means of having someone to talk to and be physically close with. He described meeting most of his sexual partners in bars or public parks and that he is incapable of meeting, conversing, or having sex with people without being drunk. He reported feeling used by men and that the men he has sex with are only having sex with him to get something from him (e.g., place to stay, money). He stated that they “are not my friends.”

A HIV-seropositive non-delayed tester who reported 2 or more stressors was white, homeless, 30-39 years old, who had a high school diploma or lower level of education, and no health insurance. He reported a long history of mental health issues that he had attempted, without much success, to get treated through the public health system. He reported significant drug use through his lifetime, including pot, speed, alcohol, and heroin and that most people would describe him as a – “junkie, thief, liar, hypocrite, careless, liar, scared, immature...”

He reported testing because his primary partner had recently tested HIV-seropositive. He reported feeling that it is “the destiny of the gay population to go out with AIDS” and that gay people deserve AIDS because “it is unnatural, unhealthy for the gay community to identify itself with their sexual practices...” He further reported that in the past he had reduced his risk of contracting HIV by only letting “love affair” partners ejaculate inside him. He didn’t ask his sex partners about their HIV statuses, and said “I don’t want to know.” He feels that even if he asked them, they could be lying, so he assumes all his partners are positive. He was a prostitute for a long time, and felt “invincible” from HIV because he did not pick it up while hustling. However, at this point in his life, he felt very “used up” and described having to “work to make sex a positive experience.”

A HIV-seropositive *delayed tester who reported 0-1 stressors* was a Hispanic, 40+ year old, who lived with a spouse/partner, is a college graduate, and has health insurance. In the past, he reported being treated for depression after breaking up with a partner of 11 years. He stopped seeking services (therapy & medication) once he recovered, and had not had problems with depression since then. He described himself as “sincere, honest, warm, generous...”

He described liking monogamous, long term relationships, having four 3+ year relationships/sex partners since he came out as gay. He reported that he did not like to do drugs or party. He noted that he and his most recent partner did not have sex until they had been dating for three months. After two years, they stopped using condoms because his partner told him, the “last time I tested, I tested negative” before they started having sex and he felt “like he was my soul mate – that this was pretty much it for me.” He reported not feeling at risk because of this. He did not identify anything stressful happening to him in the year prior to testing HIV-seropositive.

A HIV-seropositive *non-delayed tester who reported 0-1 stressors* was white, under 25 years old, living with roommates or friends, and was a college graduate with no health insurance. He reported ongoing medication management for an anxiety disorder and a history of depression that resolved three years ago. He related his depression to the stress experienced after coming out. He said that all the mental energy it was taking to appear straight was suddenly available for other things – “I came out –and I think it was like the first time that I was using my whole brain! So it was a little overwhelming.”

He reported routinely testing for HIV and that he met the man he believes infected him at a bathhouse. He described not normally meeting men in that kind of venue, but was feeling curious and it was available. He was about to leave the area after graduating college and wanted to experience that element of gay culture. “Why am I faced with this issue and it doesn’t seem to be there for anybody else. The immediacy of if you’re horny and want to have sex, if you’re gay – it’s so easy... for straight guys it’s just totally not.” He described that the existence of bathhouses is wrong and dirty, and he has to be tipsy to go to them. He did not identify anything stressful happening to him in the year prior to testing HIV-seropositive.

Discussion

HIV testing is one of the primary HIV prevention strategies supported by the U.S. government. With the accessibility of HIV testing as well as the significant personal benefits of timely HIV diagnosis, it is remarkable that a substantial proportion of MSM delay HIV testing and remain unaware of their HIV infection (Chen et al., 2012). While previous research in this area has attempted to understand the sociodemographic factors that are related to delayed HIV diagnosis, limited work has attended to personal and contextual factors (Kozak et al., 2013; MacKellar et al., 2005; Mukolo et al., 2013; Nelson et al., 2010). Our study sought to provide a preliminary view of the complicated interactions between personal and contextual factors that may lead to delayed testing among MSM.

In line with Social Action Theory, in our sample, getting tested for HIV appears to be influenced by a confluence of personal characteristics (e.g., self-efficacy to engage in protective health behaviors), as well as the social, physical, and affective context in which the testing occurs (e.g., social support, housing, mental health status). Specifically, we found that the majority of the personal and contextual factors we hypothesized would increase the level of stressors in a participant's life may not be individually associated with delayed HIV diagnosis. However, participants who indicated that they experienced two or more stressors in the past year were significantly more likely to have delayed testing.

Additionally, in our further exploration of the participants' narratives we identified some prominent patterns related to the stressor-delayed diagnosis relation. Specifically, it appears that there may be a few factors that differentiate those who are able to cope with multiple stressors and continue to engage in timely health care seeking behaviors versus those who are not. Our data indicates that men with stable social support and mental health as well as self-efficacy to engage in protective health behaviors may be more equipped to cope with multiple stressors and continue to engage in timely health care seeking behaviors. Whereas, men who are experiencing multiple stressors but are lacking in these supportive factors may not have the coping skills necessary to engage in timely health care seeking behaviors. Interventions attempting to address delayed diagnosis among MSM should specifically attempt to target social support, mental health, and self-efficacy to engage in protective health behaviors as well as integrate techniques to address coping skill deficits.

Additionally, it is possible that MSM who are experiencing multiple life stressors without the scaffolding of social support, stable mental health, and self-efficacy to engage in protective health behaviors are unable to prioritize HIV testing over more salient and pressing issues. It is likely that MSM who are experiencing multiple stressors, such as being homeless and experiencing violence, feel a need to address their physiological and safety concerns before they are able to prioritize HIV testing. If this is true, it indicates the further need for structural interventions addressing these issues in addition to interventions to increase social support, mental health treatment, and self-efficacy to engage in protective health behaviors.

Lastly, it appears that recognition of HIV risk is an important factor in delayed diagnosis. Delayed testers, regardless of level of stressors, predominantly indicated that they were unaware of their HIV risk. This result is in line with previous research which found that the majority of MSM either with late diagnosis or undiagnosed HIV infection perceived themselves to be at low risk for acquiring the virus (MacKellar et al., 2005; Schwarcz et al., 2011). While obsessing about HIV risk is likely to be maladaptive, averting attention from it may lead to delayed testing and increased risk-taking. As we found in our previous work (Nelson et al., 2010), many of the delayed testers reported that they did not frequent MSM-specific venues or identify strongly with the MSM community. As such, effective messaging and interventions hoping to increase recognition of HIV risk among MSM who delay testing may need to target men generally instead of MSM specifically and be distributed more widely to locations that are non-MSM specific.

To our knowledge there has only been one previous study exploring personal and contextual factors related to delaying testing for HIV (Schwarcz et al., 2011). In a recent qualitative and quantitative study of 41 persons who developed AIDS within 12 months of their HIV diagnosis (i.e., late testers), Schwarcz et al. (2011) found that the barriers to testing were multiple and often interwoven. Barriers in this study included fear of receiving an HIV diagnosis, concerns about ability to pay for treatment, inaccurate knowledge about treatment, inaccurate assessment of HIV risk, and the presence of mental health issues. Because late testers are a subset of delayed testers, it is likely that many of the same personal and contextual factors associated with late testing may also be associated with delayed testing; these patterns were partially supported by our previous findings (Nelson et al., 2010) and in this current investigation.

As with any study there are limitations that should be kept in mind when considering these results. First, due to our limited sample size, and thus limited power, it is possible that some of the individual characteristics that were assessed (e.g., history of incarceration, history of hospitalization for mental illness) may in fact be individually associated with delayed diagnosis. As such, we consider this a preliminary assessment of these factors and encourage further research with a larger sample size to fully explore the influence of these characteristics on delayed diagnosis. Second, we recognize that our data is now approximately ten years old and awareness of HIV risk as well as HIV testing patterns may have changed since we collected our data. While this is the case, we feel that these personal and contextual factors are likely to continue to have an influence the timeliness of HIV testing and should be further explored. Third, the use of self-reported behaviors and in-person qualitative interviews may be prone to social desirability and recall bias. Fourth, due to the demographic make-up and the recruitment locations (Thiede et al., 2009), the study population may not be representative of all MSM in the broader community who are recently diagnosed with HIV. Finally, there are potential limitations in our use of a cross-sectional design and the associated classification of delayed and non-delayed testers. Given the window period for the Vironostika-LS HIV-1 test using STARHS (145–200 days) it is possible that while a person was reactive on the LS HIV-1 test they in fact seroconverted within the past six months (Kothe et al., 2003). Additionally, as not all participants were evaluated using STARHS, there were some cases where we relied on self-reported HIV testing history to establish whether a person seroconverted within six months of testing or not. Thus, it is also possible that while a person did not test within the past six months, he, in fact, seroconverted within the past six months. While this may be the case, as reported previously (Nelson et al., 2010), the majority of participants classified as delayed testers identified an illness associated with HIV or an illness that persisted much longer than what would normally be expected in an immunocompetent person as their reason for testing, in addition to the majority having not tested within the past two years, it seems likely that most delayed testers seroconverted longer than six months prior to their HIV-seropositive test.

Overall our findings indicate that personal and contextual factors likely work in concert to influence delayed HIV diagnosis among MSM. Specifically, MSM who experience multiple life stressors, whether they are personal or contextual, have an increased likelihood of delaying HIV diagnosis. Additionally, factors such as social support, mental health, and self-efficacy to engage in protective health behaviors as well as an accurate recognition of HIV

risk appear to be of particular importance, making them ideal targets for intervention. As early HIV diagnosis is important on both a personal and community level, interventions targeting the enhancement of coping skills, self-efficacy to engage in protective health behaviors, social support, and mental health treatment as well as structural interventions targeting physiological and safety concerns will likely help MSM handle their life stressors in a more effective manner and engage in more positive health behaviors, including seeking HIV testing in a more timely manner.

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Table 1

Sociodemographic and disclosure characteristics of the 75 HIV-infected Seattle Area MSM Study participants by delayed testing status, Seattle, WA, 2002-2005.

	Total	Delayed Testers	Non-Delayed Testers	P
	N=75 n (%)	N=38 n (%)	N=37 n (%)	
Recruitment site				0.12
HAP clinic, outreach, and other sites	51 (68.0)	29 (76.3)	22 (59.5)	
STD clinic	24 (32.0)	9 (23.7)	15 (40.5)	
Age in years				<0.01
18-29	19 (25.3)	8 (21.0)	11 (29.7)	
30-39	31 (41.3)	11 (29.0)	20 (54.1)	
40+	25 (33.3)	19 (50.0)	6 (16.2)	
Race/Ethnicity				<0.01
White	44 (58.7)	19 (50.0)	25 (67.6)	
Black/African American	11 (14.7)	10 (26.3)	1 (2.7)	
Hispanic	11 (14.7)	7 (18.4)	4 (10.8)	
Other	9 (12.0)	2 (5.3)	7 (18.9)	
High school or less education	20 (26.7)	13 (34.2)	7 (18.9)	0.13
Gay sexual orientation	63 (88.7)	32 (84.2)	31 (93.9)	0.27
Out to 50% about male-male sex	22 (29.3)	17 (44.7)	5 (13.5)	<0.01
Health insurance	24 (32.9)	13 (36.1)	11 (29.7)	0.56

Note. Participants were recruited from the Public Health-Seattle & King County (PHSKC) sexually transmitted diseases (STD) and HIV/AIDS Program (HAP) clinics, HAP community outreach testing sites, and two university HIV clinics

Table 2

Variables hypothesized to increase participants' stressors among the 75 HIV-infected Seattle Area MSM Study participants by delayed testing status, Seattle, WA, 2002-2005.

	Total		Delayed		Non-Delayed		P
	N=75		n=38		n=37		
	n	%	n	%	n	%	
Experienced violence in past 12 months	17	22.7	10	26.3	7	18.9	0.58
Experienced relationship issues in past 12 months	39	52.0	20	52.6	19	51.4	1.00
Experienced substance use issues in past 12 months	24	32.0	13	34.2	11	29.7	0.81
History of hospitalization for mental illness	13	17.3	8	21.1	5	13.5	0.54
Homeless	14	18.7	12	31.6	2	5.4	0.01
History of incarceration	30	40.0	19	50.0	11	29.7	0.10
2+ of the above stress variables	40	53.3	26	68.4	14	37.8	0.01

Note. Violence = 1) doing something violent, acting out, or being malicious; 2) being physically abused or hurt; 3) being sexually abused, molested, or raped; or 4) being verbally or emotionally abused or hurt; Relationship issues = significant events in their romantic, family, or friendship relationships; Substance use issues = illicit drug or alcohol use, attempting to become sober, overdosing, and/or entering detoxification treatment or other substance use related programs; Homelessness = being homeless or having a non-permanent residence; History of incarceration = having spent a night in jail.