Journal of Aging and Health

http://jah.sagepub.com

Comorbid Substance Use and HIV Risk in Older African American Drug Users

Sharon D. Johnson, Catherine Striley and Linda B. Cottler

J Aging Health 2007; 19; 646
DOI: 10.1177/0898264307301169

The online version of this article can be found at:
http://jah.sagepub.com/cgi/content/abstract/19/4/646

Published by:
SAGE
http://www.sagepublications.com

Journal of Aging and Health
Volume 19 Number 4
August 2007 646-658

10.1177/0898264307301169
http://jah.sagepub.com
hosted at
http://online.sagepub.com

Comorbid Substance Use and HIV Risk in Older African American Drug Users

Sharon D. Johnson, PhD
University of Missouri–St. Louis
Catherine Striley, PhD
Linda B. Cottler, PhD
Washington University School of Medicine, St. Louis, Missouri

Objectives: This analysis examines substance abuse/dependence and related HIV risk behaviors among older drug users in comparison to their younger counterparts. **Methods:** Data related to substance use disorders and HIV-related behaviors were collected from 1,079 African American drug users recruited using a street outreach method. **Results:** Older users were less likely to have engaged in recent sexual activity, but those who did engage did not vary significantly in their sexual risk behaviors than did drug users aged 25 to 44. Older users were more likely to abuse cocaine and be opiate dependent than younger users were, and this abuse and dependence, along with alcohol abuse, were associated with older users' perception of their risk for HIV/AIDS. **Discussion:** Although the years 25 to 44 are considered a critical age for HIV risk, older substance users have similar levels of risk for HIV/AIDS. However, older users may not understand how some behaviors contribute to HIV risk.

Keywords: *HIV risk; substance use; age; African Americans*

Attention to HIV risk among individuals aged 25 to 44 is at a peak, given that statistics indicate that this age group makes up the largest proportion of those infected with AIDS (Centers for Disease Control and

Authors' Note: Address all correspondence to Dr. Sharon Johnson, University of Missouri–St. Louis, School of Social Work, 590 Lucas Hall, One University Blvd., St. Louis, MO 63121; e-mail: Sharon_Johnson@umsl.edu.

Prevention [CDC], 2004). Less attention, however, is given to those whose age is above this range, perhaps because of their perceived low risk for infection. Older individuals' risk for HIV may be slightly elevated because of general misconceptions regarding their engagement in high-risk behaviors and their lack of education regarding risk (Strombeck & Levy, 1998; Williams & Donnelly, 2002). Increased stigma and a lack of prevention messages targeting high-risk behaviors among older individuals may also heighten vulnerability to exposure to HIV. Few older individuals perceive that they are at high risk for HIV/AIDS (Radda, Schensul, Disch, Levy, & Reyes, 2003), and fewer receive HIV testing (Stall & Catania, 1994). Individuals aged 50 and older have distinct characteristics that enhance their level of vulnerability, in comparison to younger individuals who are at risk for HIV. For instance, physical changes in the aging body can increase older individuals' vulnerability to HIV (Levy, 1998). Upon infection, symptoms of HIV may be missed because older individuals may mistake these symptoms with those of natural aging, making diagnosis of HIV infection less expeditious (CDC, 1998; National Institute on Aging, 2004). Death resulting from AIDS is more likely to occur immediately after diagnosis in individuals 50 and older than it is in any other age group (CDC, 1998; Inungu, Mokotoff, & Kent, 2001).

Substance use increases risk for HIV infection (CDC, 2002), yet few drug users of any age acknowledge the risks associated with their drug use (Silbersiepe & Hardy, 1997). The role of injection drug use in HIV infection is clear. The CDC estimates that one third of the AIDS cases in the United States are attributable to injection drug use (CDC, 2002). Use of other substances, such as crack cocaine, is known to have an indirect association with HIV risk because of the risky sexual behaviors that users tend to engage in when using substances (CDC, 2002; Johnson & Sterk, 2003). Additionally, substance use and abuse among older individuals create challenges for identifying risk in this age group because symptoms of use may present differently than do symptoms among younger populations (Widlitz & Marin, 2002). This lack of identification of substance use symptoms, coupled with issues associated with perceptions of HIV risk, indicates that prevention and treatment of HIV among older users are less likely to occur.

Few studies have examined the nature of HIV risk among older substance users, and even fewer have examined this risk among African American or other ethnic minority populations. Similar to older persons, African Americans have characteristics that increase their chances for HIV infection and elevated negative outcomes. African Americans have an increased rate of AIDS-related deaths, as compared to the rate for Whites and other ethnic groups (CDC,

2003). To better understand HIV risk among older African American drug users, these analyses examine the high-risk behaviors of older drug users, as compared to younger and seemingly more at-risk users, to determine differences in prevalence of substance abuse and dependence, level of sexual risk taking, factors that lead to self-perception of risk for HIV/AIDS, and prevention efforts. We hypothesized that substance use becomes a neutralizing factor in the association of age and HIV risk such that there are few observed differences in HIV risk behaviors among older versus younger drug users.

Methods

Sample

These analyses use data collected from the St. Louis EachOneTeachOne project, a National Institute on Drug Abuse–funded study aimed at examining HIV risk behaviors and HIV risk-reduction interventions among out-of-treatment users of injection drugs and crack cocaine and heroin (Cottler et al., 1998). Participants were interviewed between January 1994 and June 1998. Of the 1,220 respondents who completed baseline interviews, 90% ($n = 1{,}098$) were African American. Of the African Americans, 75% ($n = 821$) were aged 25 to 44, 16% ($n = 171$) were aged 45 to 49, and 8% ($n = 87$) were aged 50 to 71. The 1,079 African Americans who were 25 and older compose the sample for these analyses. Because preliminary analyses revealed no significant differences in those aged 45 to 49 from those 50 and older, the two categories were combined for the analyses presented herein.

Data Collection

Using street outreach, a team of Community Health Outreach Workers recruited current injection drug users, heroin smokers, or crack cocaine users at least 18 years of age (Cunningham, Cottler, & Compton, 1996; Cunningham-Williams et al., 1999). Drug use was confirmed with track marks for injectors and urine tests for noninjectors. After the Washington University School of Medicine Human Subjects Committee approved the study, informed consent was obtained and interviewing began. Two weeks after the interviews, participants received post–HIV test counseling and were randomly assigned to either a standard or an enhanced intervention group. Both intervention groups received general information about HIV/AIDS infection. The enhanced intervention comprised a group that received an additional four educational sessions conducted by peers covering issues relating to HIV/AIDS prevention,

including substance abuse and stress management. All participants were then reinterviewed 3 months postbaseline to assess reported change in HIV-related behaviors. Baseline data are used for these analyses.

Measures

Demographics and sexual risk behaviors. The structured National Institute on Drug Abuse Risk Behavior Assessment (Needle et al., 1995) queries demographic and health-related factors (e.g., history of sexually transmitted diseases and perceptions of risk for HIV). History of sexually transmitted diseases includes whether those surveyed had ever been diagnosed as having hepatitis B, gonorrhea, syphilis, genital warts, chlamydia, or genital herpes. Respondents were asked whether they had engaged in any anal, oral, or vaginal sex within the last 30 days. Those having sex were then asked about their high-risk sexual behaviors occurring in the past 30 days, which included exchanging sex for money or drugs; having sex after or while using alcohol, marijuana, or cocaine; having multiple sexual partners; and knowledge of an intimate sexual partner's injection drug use. Each question was measured as a dichotomous item (*yes*/*no*).

Drug use. Drug use was a required criterion for inclusion in the study; thus, all participants met criteria for this factor. In addition, questions regarding type of substance used (categorical), frequency of use (continuous), onset and recency of use (categorical), and behaviors specific to drug use (dichotomous) were queried with the Risk Behavior Assessment.

The National Institute of Mental Health's Diagnostic Interview Schedule (Robins, Helzer, Cottler, & Goldring, 1989) elicits data on psychopathology based on criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., revised; 1987).

Posttraumatic stress disorder. Posttraumatic stress disorder was determined by asking the respondents whether they had ever experienced a terrible event in their lifetime (*yes*/*no*). The events were as follows: being threatened, narrowly escaping danger, being in a disaster, being in combat, being suddenly injured or involved in an accident, seeing someone badly injured or killed, receiving news of a sudden death or injury, and being the victim of a physical assault or rape. Those who answered *yes* to a traumatic event were then asked follow-up questions to assess whether they met criteria for posttraumatic stress disorder for that particular event.

Major depressive disorder. Major depressive disorder was also determined using the Diagnostic Interview Schedule. Respondents were asked about lifetime occurrences of feelings and behaviors within nine *DSM–III–R* criterion groups (*yes/no*). These included depressed mood, diminished interest, altered eating habits, disturbed sleep patterns, impaired psychomotor functioning, impaired cognitive functioning, fatigue, thoughts of worthlessness, and suicidal thoughts and ideations.

Sexual dysfunction. Sexual dysfunction, the diagnostic category that features inhibition in sexual desire or psychophysiological changes that interfere with a complete sexual response cycle, was measured with the following dichotomous Diagnostic Interview Schedule questions: Has there ever been a period of months when you were bothered by being unable to experience an orgasm? Has having sexual relations ever been physically painful for you? Have you had any other kind of sexual difficulties? Has there been a period of several months in your life when having sex was not pleasurable (even if it was not painful)? There was an exclusion probe to determine if the dysfunction was exclusively due to a medical condition or a medication. Only those who met clinical severity for at least one of these criterion items were included in these analyses as having psychosexual dysfunction.

Antisocial personality disorder. Antisocial personality disorder required that three criteria be met: age 18 or older, onset of three or more positive conduct disorder groups before age 15 (e.g., starting fires, physical cruelty to animals, frequent lying), and four or more positive adult behavior problem groups (e.g., irritable and aggressive behavior, impulsive behavior, failure to conform to social norms of lawful behavior). The presence or absence of antisocial personality disorder was measured as a dichotomous item.

Data Analysis

Logistic regression analyses were used to estimate group differences between younger and older drug users, including demographic factors, current levels of drug use, and recent sexual risk behaviors. Logistic regression analyses were also conducted to determine the within-group risk factors that increased perception of HIV risk. To determine if age of onset (continuous variables) for each substance differed significantly by age group, *t*-test analyses were conducted. All analyses were conducted in the SAS 8.2 statistical program.

Table 1
Select Demographic Characteristics of African American Drug Users Aged 25–44 Compared to Participants 45 and Older ($N = 1,079$)

	Aged 25–44 ($n = 821$)	Aged 45 and over ($n = 258$)	OR[a] (95% CI)
Demographics			
Male	56%	80%	3.15 (2.25–4.41)
No GED/diploma	36	29	0.73 (0.54–0.99)
Employed	18	18	1.01 (0.70–1.44)
Never married	47	24	0.36 (0.26–0.49)
Psychopathology			
Depression	13	9	0.63 (0.38–10.03)
Antisocial personality disorder	31	31	1.00 (0.73–1.37)
Posttraumatic stress disorder	18	19	1.07 (0.75–1.52)
Sexual dysfunction	31	25	0.74 (0.54–1.03)
Alcohol abuse	20	24	1.27 (0.91–1.77)
Alcohol dependence	32	29	0.90 (0.66–1.22)
Cocaine abuse	7	11	1.76 (1.10–2.83)
Cocaine dependence	84	66	0.38 (0.27–0.52)
Opiate abuse	2	4	1.91 (0.86–4.22)
Opiate dependence	23	69	7.41 (5.44–10.09)
Sex-related behaviors			
No recent sexual activity	15	30	2.41 (1.74–3.35)
Sex trading[b]	15	7	1.09 (0.45–2.64)
Two or more sex partners[b]	38	34	0.85 (0.60–1.20)
Injection-drug-using partner[b]	11	14	1.27 (0.78–2.06)
Sex/drug mixing[b]	84	77	0.62 (0.41–0.92)
STD history (lifetime)	55	69	1.78 (1.32–2.39)

Note: OR = odds ratio; CI = confidence interval.
a. Probability modeled is 45 and older.
b. Only among those having recent sex (last 30 days).

Results

The 1,079 African American drug users were majority male (62%, $n = 669$). Older respondents were 3 times (odds ratio [OR] = 3.15, 95% confidence interval [CI] = 2.25–4.41) more likely than younger respondents to be male (see Table 1). The mean age of the sample was 39.29 years ($SD = 7.27$). Over one third of the respondents had no high school diploma or GED, and, surprisingly, this was less likely among the older users (OR = 0.73, 95% CI = 0.54–0.99). Only 18% ($n = 196$) of the entire sample was employed. Older

drug users were less likely than younger users to have never married (OR = 0.36, 95% CI = 0.26–0.49).

Although 12% (n = 123) of the sample reported a lifetime diagnosis of depression, antisocial personality disorder (31%, n = 315), posttraumatic stress disorder (19%, n = 201), and a sexual dysfunction (30%, n = 298) were more common. Younger and older respondents did not differ in the lifetime prevalence of any of the psychopathologies examined.

Drug use. Assessment of substance use disorders revealed that 53% (n = 138) of older users endorsed alcohol abuse or dependence, 77% (n = 199) endorsed cocaine abuse or dependence, and 72% (n = 187) endorsed opiate abuse or dependence. Although neither alcohol abuse nor dependence varied by age, older users were more likely than younger users to abuse cocaine (OR = 1.76, 95% CI = 1.10–2.83) and be opiate dependent (OR = 7.41, 95% CI = 5.44–10.09) but were less likely to be cocaine dependent (OR = 0.38, 95% CI = 0.27–0.52) than were younger users. To further differentiate substance use among this active drug-using sample, respondents were asked about age of onset for substance use. The entire sample had a relative early onset for alcohol (M = 14.51 years, SD = 3.35), which did not differ among older and younger users. Younger drug users had significantly earlier onsets of marijuana use (M = 15.67, SD = 3.48 versus M = 16.51, SD = 3.97; t = –3.21, df = 1,026, p = .0014), cocaine use (M = 23.04, SD = 5.81 versus M = 26.83, SD = 8.73; t = –6.76, df = 700, $p < .0001$), and crack cocaine use (M = 27.44, SD = 6.25 versus M = 39.71, SD = 6.25; t = –24.46, df = 1,007, $p < .0001$) than did older users. Older users had a significantly earlier onset of heroin use than did younger users (M = 20.97, SD = 6.41 versus M = 23.23, SD = 6.58; t = 3.97, df = 551, $p \leq .0001$).

Recent sexual risk behaviors. Older drug users were 2 times (OR = 2.41, 95% CI = 1.74–3.35) more likely to report the lack of recent sexual activity than were younger users. The sexual risk behaviors among those having sex within the last 30 days were substantial within both age groups. Sex trading was reported by 13% (n = 139) of the sample and did not vary by age cohort. Frequency of sex partners and having a sex partner who was an injection drug user also did not differ across the age groups. Older drug users were less likely (OR = 0.62, 95% CI = 0.41–0.92) than younger users to report having sex within 1 hr before or after using drugs or alcohol. In addition, a history of a least one sexually transmitted disease was reported by 58% (n = 630) of the entire sample, whereas older users were over 1.5 times (OR = 1.78, 95% CI = 1.32–2.39) more likely than younger users to report such a history.

In determining differential influence of substance abuse or dependence on risky sexual behaviors, logistic regression analyses revealed that older drug users were 2 times (OR = 2.11, 95% CI = 1.04–4.29) more likely to intermingle substances with sexual activity and that older users with cocaine abuse or dependence were 3 times (OR = 3.05, 95% CI = 1.26–7.38) more likely to have two or more recent sex partners. No other high-risk sexual behavior was associated with alcohol, cocaine, or opiate abuse or dependence.

Perception of risk. To determine factors contributing to greater perception of risk within each age group, bivariate logistic regressions were used to compare those individuals who believed that they had at least a 50% chance of contracting HIV/AIDS to those who believed that they had less than a 50% chance of contracting HIV/AIDS (see Table 2). Differing factors were associated with older and younger drug users' perception of risk of HIV/AIDS. Among younger drug users, depression disorder, antisocial personality disorder, sexual dysfunction, a history of a sexually transmitted disease, two or more recent sex partners, a recent injection-drug-using sex partner, and mixing the use of drugs with sexual activity were each associated with greater perception of risk. Employment and cocaine abuse were associated with less perceived risk among younger users.

Fewer factors influenced older users' perception of risk. Older males were more likely than older females to perceive a greater risk for HIV/AIDS. Older users with a sexual dysfunction were 2 times (OR = 2.09, 95% CI = 1.11–3.94) more likely to perceive greater risk for HIV/AIDS than those without a sexual dysfunction. Alcohol abuse, cocaine abuse, and opiate dependence each enhanced perceptions of risk among older users. Among the sex-related factors, only a history of a sexually transmitted disease and having two or more recent sex partners enhanced perception of risk for HIV/AIDS among older drug users.

HIV prevention. Overall, 38% ($n = 410$) of the sample had never received a blood test for HIV, and 63% ($n = 674$) had never received any information or risk-reduction supplies for AIDS prevention. This did not vary across older and younger users. Of those who had ever received information ($n = 405$), 47% ($n = 189$) had received recent (last 30 days) information about AIDS, only 1% ($n = 4$) had received a clean needle, and 36% ($n = 145$) had received condoms. Older respondents were almost 4 times more likely to have received bleach for cleaning needles than were the younger users (OR = 3.77, 95% CI = 1.89–7.52).

Table 2
Logistic Regression Analysis of Factors Influencing African American Drug Users' Perception of Having a 50% Chance or Greater of Contracting HIV/AIDS (N = 1,079)

	Aged 25–44 (n = 821)	Age 45 and over (n = 258)
Demographics		
Male	1.20 (0.86–1.68)	2.45 (1.04–5.74)
No GED/diploma	1.13 (0.81–1.59)	0.65 (0.34–1.25)
Employed	0.58 (0.36–0.94)	1.33 (0.66–2.68)
Never married	1.03 (0.74–1.43)	0.83 (0.42–1.63)
Psychopathology		
Depression	1.79 (1.13–2.84)	0.91 (0.32–2.60)
Antisocial personality disorder	1.80 (1.26–2.56)	1.63 (0.89–2.99)
Posttraumatic stress disorder	1.27 (0.84–1.90)	1.20 (0.60–2.40)
Sexual dysfunction	1.71 (1.20–2.44)	2.09 (1.11–3.94)
Alcohol abuse	0.70 (0.45–1.08)	1.96 (1.05–3.64)
Alcohol dependence	1.91 (1.36–2.68)	0.89 (0.48–1.66)
Cocaine abuse	0.33 (0.13–0.84)	2.34 (1.05–5.22)
Cocaine dependence	2.05 (1.21–3.47)	1.35 (0.73–2.48)
Opiate abuse	1.92 (0.70–5.27)	0.32 (0.04–2.57)
Opiate dependence	2.56 (1.79–3.68)	2.79 (1.37–5.69)
Sex-related behaviors		
STD history (lifetime)	2.04 (1.44–2.89)	2.18 (1.11–4.28)
No recent sexual activity	0.85 (0.53–1.36)	0.62 (0.32–1.19)
Sex trading[a]	2.38 (1.16–4.89)	0.58 (0.11–3.10)
Two or more sex partners[a]	3.27 (2.26–4.71)	3.19 (1.62–6.28)
Injection-drug-using partner[a]	4.27 (2.62–6.97)	1.63 (0.67–3.99)
Sex/drug mixing[a]	2.23 (1.23–4.02)	1.86 (0.79–4.36)

Note: Odds ratio (95% confidence interval). Probability modeled is greater perceived risk.
a. Among those who report recent sexual activity (within last 30 days).

When respondents were asked if they had changed specific behaviors in the last 30 days to reduce their chance of contracting HIV/AIDS, 27% (n = 87) of those with IV drug use reported that they had cut back on intravenous drug use. Of those who shared needles, 36% (n = 66) reported that they had cut back on needle sharing. Of those sexually active, 26% (n = 234) cut back on the number of sex partners, and 20% (n = 134) used a condom or latex protection more often. These risk-reduction behaviors did not vary across older and younger users.

Discussion

These analyses address whether older African American drug users have increased or similar risk for HIV when compared to African American drug users who are within the critically defined age range of 25 to 44. In comparison of the two age groups, some interesting findings emerge. Older users were more likely to report lifetime histories of sexually transmitted diseases. This can be a reflection of having more years for the possibility of infection or more years of a lack of prevention or intervention for high-risk sexual behaviors. The sexual risk behaviors of older users who reported recent sexual activity did not vary drastically from those of their younger counterparts. Younger users were more likely to mix sexual encounters with the use of alcohol and drugs than were older users. Although it is commonly assumed that sex-trading behavior decreases with age, we found no difference in sex trading by age. Similarly, having two or more recent sex partners and an injection-drug-using sex partner might be assumed to be behavior of the young, yet we found no age-related difference. For older users, alcohol abuse or dependence was associated with their mixing of substance use with sexual activity, and cocaine abuse or dependence was associated with having more sexual partners. The latter is similar to Johnson and Sterk's findings (2003) that late-onset crack cocaine users engage in high-risk behaviors in high-risk contexts. Our findings may not be unique to older African American drug users, even though Stall and Catania (1994) found that HIV risk behaviors were more prevalent among older African American than among older White or Hispanic users. Our knowledge of the HIV risk among other older drug-using ethnic minorities is limited, and additional research in this area is needed.

Reinforcing other research, this study shows that the risk for HIV was substantial for this particular sample of urban-dwelling drug users; yet, the perception of risk and efforts to reduce risk were limited. Over half of the individuals, despite their age grouping, had engaged in recent high-risk sexual behaviors, such as having sex within 1 hr of using alcohol or drugs. Yet, not even a quarter of the sample believed that they had greater than a 50–50 chance of contracting HIV/AIDS. Involvement in high-risk activities such as sex trading was not significantly related to either group's perception of its risk for HIV/AIDS. Although both age groups may recognize the significance of having two or more recent sex partners, older users may not perceive that behaviors such as having an injection-drug-using sex partner and intermingling sex and drug use are significant to their HIV risk.

Unique to this research was an examination of differential factors that contribute to younger and older users' perceptions of their risk for HIV. Findings suggest that risk perception is enhanced in the presence of depression and antisocial personality disorder in younger users but not in older users. It could be that depressed persons have a gloomier general outlook on life, one that in this case gives them a more realistic fear of risky behavior than that of their peers. Alternatively, depressed persons are known to receive more medical care and may thus be better informed of risk factors. Only sexual dysfunction predicted perceived risk for older users. It is not clear why those with sexual dysfunction may more accurately perceive the risk for HIV. Those with a sexual dysfunction may attribute it to their risky sexual behaviors. Clearly, additional research is warranted in this area.

Though our sample is unique in a number of ways—for instance, it is a large nonclinical sample of active drug users who were out of treatment—we offer the following caveats, potentially affecting the implications of our findings. The data presented are self-reported, thus resulting in some potential bias. Further, because of the retrospective nature of these data, causal paths could not be ascertained. We recognize that these data are limited in their ability to test non-study-specific hypotheses because these data were collected to examine HIV risk behaviors in response to an intervention. In addition, the data did not allow for the assessment of additive effects of drug use, age, and race on HIV risk behaviors and perceptions. The implications derived from the study, despite these limitations, are significant—especially for intervention efforts among older African American drug users.

Prevention is a critical area of focus for older substance-using African American populations. The lack of prevention messages and increased awareness of the nature and transmission of HIV/AIDS within older individuals unnecessarily places them at greater risk for contracting HIV. Recent attempts within varying fields of study have emerged to provide guidelines for practice with older individuals who have HIV/AIDS or are at risk for HIV/AIDS (Linsk, Fowler, & Klein, 2003; Williams & Donnelly, 2002). The problem of identification for prevention efforts is hindered twofold among drug-using populations. First is the issue of ageism, and second is the lack of awareness that substance use is a problem among older individuals (Levin & Kruger, 2002). Service providers and family members may lack the insight that specific behaviors are associated with substance use and thus may attribute such behaviors to the natural aging process. Proper identification of substance abuse within older populations could be the first step in formulating appropriate HIV prevention efforts among older drug users.

Coon, Lipman, and Ory (2003) advocate a multilevel intervention approach to HIV prevention with older adults, based on the range of potential influence on individuals and behaviors. Given the additional negative influence of substance use among older adults, such a multilevel approach should include substance use awareness for older persons and providers of services to the population. Within this sample of active drug users, some prevention efforts appear to be matched with behavior—for instance, older drug users were more likely than younger users to have received bleach. This may be due to the significantly higher prevalence of heroin use among older users. Other prevention efforts did not vary across the age groups, and neither did individual efforts to reduce chances of contracting HIV. This study found that some behaviors were substantially different across the age groups, whereas there were some behaviors that were highly prevalent in older and younger users. Yet, because of the enhanced detrimental outcomes associated with HIV postinfection among older populations, there should be a mandate for enhanced prevention and intervention efforts.

References

American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., revised). Washington, DC: Author.

Centers for Disease Control and Prevention. (1998). AIDS among persons aged greater than or equal to 50 years—United States, 1991–1996. *Morbidity and Mortality Weekly Report, 47*(2), 21-27.

Centers for Disease Control and Prevention. (2002). *Fact sheet: Drug-associated HIV transmission continues in the United States*. Atlanta, GA: Author.

Centers for Disease Control and Prevention. (2003). *Fact sheet: HIV/AIDS among African Americans*. Atlanta, GA: Author.

Centers for Disease Control and Prevention. (2004). *Basic statistics*. Retrieved September 12, 2005, from http://www.cdc.gov/hiv/stats.htm#cumaids

Coon, D. W., Lipman, P. D., & Ory, M. G. (2003). Designing effective HIV/AIDS social ad behavioral interventions for the population of those age 50 and older. *Journal of Acquired Immune Deficiency Syndromes, 33*, S194-S205.

Cottler, L. B., Compton, W. M., Abdallah, A. B., Cunningham-Williams, R., Abram, F., Fichtenbaum, C., et al. (1998). Peer-delivered interventions reduce HIV risk behaviors among out-of-treatment drug abusers. *Public Health Report, 113*(Suppl. 1), 31-41.

Cunningham, R., Cottler, L. B., & Compton, W. M. (1996). Are we reaching and enrolling at-risk drug users for prevention studies? *Journal of Drug Issues, 26*, 541-560.

Cunningham-Williams, R. M., Cottler, L. B., Compton. W. M., Desmond, D. P., Wechsberg, W., Zule, W. A., et al. (1999). Reaching and enrolling drug users for HIV prevention: A multi-site analysis. *Drug and Alcohol Dependence, 54*, 1-10.

Inungu, J. N., Mokotoff, E. D., & Kent, J. B. (2001). Characteristics of HIV infection in patients fifty years or older in Michigan. *AIDS Patient Care and STDs, 15*, 567-573.

Johnson, W. A., & Sterk, C. (2003). Late-onset crack users: An emergent HIV risk group. *Journal of Acquired Immune Deficiency Syndromes, 33*, S229-S232.

Levin, S. M., & Kruger, J. (2002). *Substance abuse among older adults: A guide for social service providers. Treatment Improvement Protocol 26*. Rockville, MD: Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment.

Levy, J. A. (1998). AIDS and injecting drug use in later life. *Research on Aging, 20*(6), 776-797.

Linsk, N. L., Fowler, J. P., & Klein, S. J. (2003). HIV/AIDS prevention and care services and services for the aging: Bridging the gap between service systems to assist older people. *Journal of Acquired Immune Deficiency Syndromes, 33*, S243-S250.

National Institute on Aging. (2004). *HIV, AIDS, and older people*. Retrieved September 12, 2005, from http://www.niapublications.org/engagepages/aids.asp

Needle, R., Fisher, D. G., Weatherby, N., Chitwood, D., Brown, B., Cesari, H., et al. (1995). Reliability of self-reported HIV risk behaviors of drug users. *Psychology of Addictive Behavior, 9,* 242-250.

Radda, K. E., Schensul, J. J., Disch, W. B., Levy, J. A., & Reyes, C. Y. (2003). Assessing human immunodeficiency virus (HIV) risk among older urban adults: A model for community-based research partnership. *Family Community Health, 26*(3), 203-213.

Robins, L. N., Helzer, J. E., Cottler, L. B., & Goldring, E. (1989). *Diagnostic Interview Schedule, Version 3 (Revised)*. St. Louis, MO: Washington University Press.

Silbersiepe, K. A., & Hardy, A. M. (1997). AIDS knowledge and risk perception of cocaine and crack users in a national household survey. *AIDS Education and Prevention, 9*(5), 460-471.

Stall, R., & Catania, J. (1994). AIDS risk behaviors among late middle-aged and elderly Americans. *Archives of Internal Medicine, 154*, 57-63.

Strombeck, R., & Levy, J. A. (1998). Educational strategies and interventions targeting adults age 50 and older for HIV/AIDS prevention. *Research on Aging, 20*(6), 912-936.

Widlitz, M., & Marin, D. B. (2002). Substance abuse in older adults: An overview. *Geriatrics, 57*(12), 29-34.

Williams, E., & Donnelly, J. (2002). Older Americans and AIDS: Some guidelines for prevention. *Social Work, 47*(2), 105-107.