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Changes in Sexual Behavior and STD Prevalence Among Heterosexual STD Clinic Attendees: 1993–1995 Versus 1999–2000

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Objective: **To examine trends in sex behaviors and STD prevalence over time among heterosexual STD clinic populations from 3 urban STD clinics in the United States.**

Study Design: **Cross-sectional analysis comparing baseline data on risk (self-reported) and STDs (laboratory defined) from 2 randomized controlled trials evaluating counseling efficacy conducted about 5 years apart, Project RESPECT (1993–1995) and RESPECT-2 (1999–2000).**

Results: **The participants from RESPECT (n = 2457) and RESPECT-2 (n = 3080) were demographically similar. However, the proportion of participants reporting any unprotected anal sex was much higher in RESPECT-2 (women: 7% vs. 18%; men: 7% vs. 17%). Also, substantially more participants reported a new sex partner in RESPECT-2 (women: 43% vs. 61%; men: 54% vs. 72%). In addition, more women reported 2 or more partners (37% vs. 48%) and a partner with another concurrent sex partner (19% vs. 32%). Slightly more women and men in RESPECT-2 reported 2 protective behaviors, having an HIV test and any condom use; however, consistent condom use did not differ. Conversely, the proportion of participants with bacterial STDs (chlamydia, gonorrhea, or syphilis) was much lower in RESPECT-2 (women: 24% vs. 18%; men: 38% vs. 24%).**

Conclusions: **Despite substantial promotion of safer sex behaviors over the past decade, many risk behaviors were stable over time, and some behaviors, such as unprotected anal sex, appeared substantially higher. Even in the absence of widespread behavior change, the prevalence of common bacterial STDs appeared to have decreased appreciably.**

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STD PREVENTION INTERVENTIONS stress the importance of changing risky behaviors in order to reduce disease prevalence. Since the first patients with HIV/AIDS were identified over 25 years ago, prevention messages addressing safer sex have become increasingly sophisticated and widespread. In particular, the past decade has seen promotion of generalized community approaches such as abstinence, be faithful, use condoms (ABC). Although prevention efforts expanded, improvements in HIV/AIDS treatment were also made during this time. Highly active antiretroviral therapy (HAART) was introduced in the late 1990s, changing the face of HIV. Although HAART has saved many lives, one possible negative result of HAART availability is behavioral disinhibition or "risk compensation" (i.e., individuals at high risk for HIV are more willing to practice risky behaviors in the face of decreasing fear about HIV and its consequences).[1]

Evaluating trends in sexual risk behaviors can help quantify behavioral disinhibition, assess the effectiveness of recent prevention messages, or identify new prevention strategies that should be considered. Some behavioral data are available from repeated national surveys, such as the Behavioral Risk Factor Surveillance System, the National Health and Nutrition Examination Survey, and the National Survey of Family Growth.[2–4] However, such surveys tend to avoid highly sensitive sexual risk behavior data and their broad scope usually allows only a few questions in any single area. No large-scale, ongoing national surveys on sexual risk behaviors have been conducted in the United States. In Great Britain, the National Survey of Sexual Attitudes and Lifestyles (NATSAL), conducted in 1990–1991 and 1999–2000, has provided detailed data at 2 different time points on sexual behavior in the overall population. An extensive comparison was possible and yielded valuable information on changes in sexual risk behaviors between the 2 surveys.[5]

Another approach to examining trends is to conduct secondary analyses assessing specific sexual risk factors using existing data from research studies conducted in similar populations. Research studies are better able to address a larger number of specific behaviors, including more highly sensitive behaviors. However, these types of studies are generally conducted at a single time point or over a short duration of time (e.g., 1–2 years), and trend analyses across studies are difficult when study populations are different.

We had access to data from 2 prevention trials conducted about 5 years apart among patients attending 3 large STD clinics in the United States. The first trial enrolled STD clinic patients from 1993 to 1995, whereas the second enrolled patients from 1999 to 2000. Substantial, similar data on specific sexual risk behaviors, clinical history and examination, and STD laboratory testing were collected in the 2 trials, allowing us to compare similar high-risk populations at 2 different time points to assess how behaviors and STD rates may have changed

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over time, in the era of HAART and with widespread promotion of sexual behavior prevention messages.

Materials and Methods

Data used in this analysis were collected during the baseline visits of 2 prevention trials evaluating HIV counseling among STD clinic patients. The first trial, Project RESPECT, enrolled heterosexual patients from 1993 to 1995; the second, RESPECT-2, enrolled patients from 1999 to 2000.[6,7]

The 2 trials had many similarities. Project RESPECT was conducted in 5 urban US STD clinics. RESPECT-2 was conducted in 3 of the clinics: Newark, NJ; Denver, CO; and Long Beach, CA. The 2 trials also had similar eligibility criteria. Participants must have come to the STD clinic for a full exam and speak and understand English well enough to participate in the interventions and questionnaires. The first trial enrolled patients aged 15 years or older who reported having had vaginal sex in the past 30 days, while the later trial enrolled participants aged 15–39 years who reported having had vaginal or anal sex in the past three months. Men reporting sex with another man (MSM) during the previous 12 months were not eligible for enrollment into Project RESPECT, while RESPECT-2 did not make this exclusion. Participation rates were similar (Project RESPECT: 43%; RESPECT-2: 44%). For both trials, structured behavioral questionnaires were administered to participants at baseline, 3, 6, 9, and 12 months after study enrollment. Project RESPECT utilized trained interviewers who conducted face-to-face questionnaires while RESPECT-2 used audio computer-assisted self-interviews (ACASI).

The behavioral and biologic data collected in the 2 trials were also similar. In Project RESPECT, chlamydial infection was identified through the use of a polymerase chain reaction (PCR) test on a clinician-collected cervical swab (women) or first urine specimen (men). All PCR testing was done at 1 of 2 public health research laboratories. A local chlamydia test [either culture or enzyme immunoassay (EIA)] was also obtained to allow quick provision of results. Discrepant results were determined based on a repeat PCR using a discrepant protocol. In RESPECT-2, chlamydial infection was diagnosed using a locally performed DNA probe [either PCR, ligase chain reaction (LCR), or strand displacement amplification (SDA)] based on a urine sample for both men and women. In the first trial, gonorrhea infection was diagnosed locally using a standard culture from a clinician-collected cervical (women) or urethral swab (men), or a positive Gram stain from a urethral swab in men. In the second trial, gonorrhea infection was diagnosed using a local DNA probe (either PCR, LCR, or SDA) based on a urine sample for both men and women. In Project RESPECT, trichomonas infection in women was diagnosed by either observation of trichomonads on a wet mount or a positive culture using Diamond's media from a clinician-collected cervical sample. In RESPECT-2, trichomonas infection was based on culture from a clinician-collected vaginal sample. For both studies, syphilis infection was based on a positive nontreponemal test of appropriate titer in the context of a compatible clinical history. Because the routine collection of rectal specimens was not the standard of care in the clinics at the time of either trial, routine testing for rectal STDs was not performed.

The wording used in the questions was also similar for most behavioral factors. Significant exceptions were questions regarding injection drug use, sex for money or drugs, and anal sex frequency. In the first trial, these behaviors were assessed first by an introductory "Have you ever . . ." question, followed by a question determining quantity ("How many times have you . . . in the past 3 months?") asked only to people who responded yes to the lead-in question. In the second trial, participants were only asked a direct question to determine quantity ("How many times have you . . . in the past 3 months?") without a lead-in question. In addition, in Project RESPECT, risk behaviors referred to all sex partners with whom the participant had had sex during the past 3 months, while in RESPECT-2, participants were asked to consider each of their 3 most recent partners during the past 3 months, as well as all other partners (grouped together).

To ensure compatible comparisons in the 2 studies, this analysis included only baseline data obtained from participants aged 15–39 years from the 3 common sites (Denver, Baltimore, and Newark). Only heterosexual participants were included in our analysis (for men in RESPECT-2, heterosexual was defined as reporting at least 1 partner of the opposite sex in the past 3 months and no sex partners of the same sex in the past 3 months). We also excluded participants who did not have baseline behavioral data in either trial (<1% of data for both trials). We stratified participants based on sex and age, then compared demographics, behaviors, and STD prevalence in the 2 time periods using χ^2 tests in SAS[8]; comparisons between proportions were determined to be significantly different where $P < 0.05$. We found no important difference by age; therefore, we present data stratified only by sex.

Results

Our final sample size for this analysis included 2457 participants from Project RESPECT (1993–1995) and 3080 from RESPECT-2 (1999–2000). Participants from the 2 studies were similar in sex and age, and the distribution of participants across the 3 STD clinics was comparable. Participant race and ethnicity were also similar in the 2 studies, except among participants identifying as "Other" (4% in the first trial and 9% in the second) and participants identifying as "black" (58% in the first trial and 53% in the second). Participants in RESPECT-2 were also slightly more likely to be employed (73% vs. 60% in Project RESPECT) and more likely to have at least some education beyond high school (34% vs. 26% in Project RESPECT).

Several risk factors categorized as risk-increasing behaviors were similar across the 2 time periods, notably, the lifetime number of sex partners, the proportion of participants reporting a main partner in the past 3 months, the frequency of vaginal sex, and the frequency of unprotected vaginal sex (Table 1). Although the proportion of men with 2 or more sex partners in the past 3 months remained about the same, the proportion of women reporting 2 or more partners increased from 37% to 48%. The proportion of women and men reporting a new sex partner in the previous 3 months also increased significantly (for women, 43% to 61%; for men, 54% to 72%). In addition, fewer women in RESPECT-2 reported that they believed their partners had had other concurrent sex partners in the previous 3 months (19% vs. 32% in Project RESPECT). Slightly more women reported injection drug use in the past 3 months in RESPECT-2 (3.1% vs. 1.5% in Project RESPECT).

The most striking change in risk-increasing behaviors over the 2 time periods was in reported anal sex practices. The proportion of participants reporting any anal sex in the previous 3 months was 2 times higher in RESPECT-2 than in Project RESPECT, increasing from 9% to 22% among women and 9% to 21% among men. In a parallel trend, report of any unprotected anal sex in the previous 3 months was also significantly higher in the later trial. These findings of more frequent anal sex and more unprotected anal sex were observed regardless of sex or study site and were consistent across racial and ethnic groups (Table 2). The increase in reported anal sex also occurred across age groups, suggesting no cohort effect related to age.

TABLE 1. STD Risk Behaviors and Baseline Prevalence, by Gender: 1993–1995 Compared to 1999–2000

	Women		Men	
	1993–1995 (n = 1150)	1999–2000 (n = 1491)	1993–1995 (n = 1307)	1999–2000 (n = 1589)
Risk-increasing behaviors				
Number of lifetime sex partners (mean/median)	34/9	26/9	43/20	45/15
Number of sex partners in the past 3 mo				
Mean/median	2/1	2/1	2/2	2/2
% with 2 or more partners	37	48*	55	58
Had main partner in the past 3 mo (%)	89	86	76	76
Had new partner in the past 3 mo (%)	43	61*	54	72*
Thought partner had other concurrent partner(s) in the past 3 mo (%)	32	19*	16	15
Had sex while high on alcohol or drugs in the past 3 mo (%)	43	38	51	48
Sex for money or drugs in the past 3 mo (%)	6	7	7	7
IDU in the past three months (%)	1.5	3.1*	1.4	1.5
Frequency of vaginal sex in the past 3 mo				
Mean/median number of episodes	26/12	22/12	25/12	22/11
Unprotected vaginal sex episodes in the past 3 mo				
Mean/median number of episodes	21/7	17/8	18/6	17/6
% with any unprotected vaginal sex	89	90	85	86
Frequency of anal sex in the past 3 mo				
% with any anal sex	9	22*	9	21*
Mean/median number of episodes†	3/1	4/2	4/1	4/2
Unprotected anal sex episodes in the past 3 mo				
% with any unprotected anal sex	7	18*	7	17*
Mean/median number of episodes†	2/1	4/1	2/1	3/1
Protective behaviors				
Used condom during vaginal sex in the past 3 mo (%)	59	64*	63	68*
Always use condoms during vaginal sex in the past 3 mo (%)	11	10	15	14
Ever had prior HIV test (%)	72	80*	67	73*
STD prevalence				
% With:				
Gonorrhea	10	7*	22	12*
Chlamydia	17	12*	20	14*
Syphilis	1	2	2	1*
Any of the above	24	18*	38	24*
Trichomoniasis	11	12		
Any of the above	31	26*		

Proportions may not add up to 100 due to rounding.
*P value <0.05.
†Among participants reporting any anal sex.

Three protective behaviors could be evaluated and statistically significant changes were observed for 2 of them. Slightly more women and men in RESPECT-2 reported using a condom at least once during vaginal sex in the previous 3 months (64% of women vs. 59% in the first trial; 68% of men vs. 63% in the first trial). Also, the proportion of women and men reporting having had a prior HIV test was slightly higher in the later trial (80% of women vs. 72% in the first trial; 73% of men vs. 67% of men in the first trial). Consistent condom use (100%) during vaginal sex remained the same between the 2 time periods; 10% of women and 14% of men reported consistent condom use in the second study.

Prevalence rates of bacterial STDs at the baseline exam were uniformly lower for both men and women in the second trial, with some variation in the magnitude of the STD reduction by gender (Table 1). Gonorrhea prevalence in RESPECT-2 participants was about 30% lower among women (7% vs. 10% in Project RESPECT) and about 45% lower among men (12% vs. 22% in Project RESPECT). Despite the larger reduction in men, the overall prevalence of gonorrhea in the RESPECT-2 study was still higher in men compared with women. Baseline chlamydia prevalence was also lower in the second trial, about 29% lower among women (12% vs. 17% in Project RESPECT) and 30% lower among men (14% vs. 20% in Project RESPECT). Very few participants had syphilis in either trial. Rates of trichomoniasis, a curable STD caused by a parasite, were similar among women in the 2 trials. Overall, the proportion of men and women who had at least 1 STD (chlamydia, gonorrhea, or syphilis) was lower in RESPECT-2, and this was true for each of the 3 sites.

Discussion

In the era of HIV/AIDS, considerable efforts have been directed toward generalized safer sex prevention messages, including partner reduction, monogamy, condom usage, and STD/HIV testing and treatment. These data assessing STD risk behaviors over time in 3 STD clinic populations found no evidence of partner reduction, and, in fact, suggest that having multiple partners was more common in women in 1999–2000 than in 1993–1995. Our data also show a rise in the proportion of STD clinic attendees reporting a new partner in the past 3 months. In addition, there was no appreciable increase in consistent condom use over time, with most women and men reporting substantial unprotected sex in both trials. Perhaps most notably, the practice of unprotected anal sex seems to have increased markedly in patients attending STD

TABLE 2. Anal Sex Frequency: 1993–1995 Compared to 1999–2000

	1993–1995 (n = 2457)		1999–2000 (n = 3080)
	Have You Ever Had Anal Sex? (% Yes)	How Many Times Have You Had Anal Sex in the Past 3 Months? (% With Any)	How Many Times Have You Had Anal Sex in the Past 3 Months? (% With Any)
Sex			
Men	30	9	21
Women	25	9	22
Site			
Denver	29	9	20
Long Beach	36	11	21
Newark	20	7	24
Age group			
15–19	13	5	16
20–24	24	8	21
25–29	36	11	24
30–39	38	12	24
Race/ethnicity			
Black	23	7	21
White	39	13	22
Hispanic	31	11	23
Other	24	8	21
Overall	28	9	22

clinics over the time interval studied. The only safer sex behavior that seemed to have at least modestly improved was the proportion of participants reporting an HIV test: 80% of women and 73% of men in RESPECT-2 reported having a previous HIV test. Despite relatively little indication of safer sex practices, STD prevalence declined fairly substantially among both women and men.

Few studies have reported behavioral trend data. In Great Britain, a comparison of data from the 2 most recent national surveys yielded similar results as our study,[5] with no clear directional shift in behaviors toward riskier or safer. Between 1990 and 2000, they found that the median number of partners increased, as did reports of concurrent partnerships. Although we found only an increase in inconsistent condom use, an increase in both sporadic and consistent condom use was observed in Great Britain. Data suggesting an increase in overall condom use was also reported by Catania et al. in an analysis of 3 different national surveys conducted in the United States (National AIDS Behavioral Survey in 1990, National AIDS Behavioral Methods Survey in 1992, and National Sexual Health Survey in 1996) assessing condom usage among heterosexual adults.[9] Also similar to our results, a significant increase in reported heterosexual anal sex in the past year was observed in Great Britain: the proportion of women reporting recent anal sex rose from 6.5% in 1990 to 11.3% in 2000 among women and from 7.0% to 12.3% among men.[5] Reported anal sex was also compared using data from 2 surveys conducted in Seattle, WA, about 10 years apart: the proportion of respondents reporting anal sex in their most recent heterosexual partnership was 4.3% in 1995 but was 8.3% in 2004.[10]

Why might the practice of anal sex appear to rise so substantially among both men and women in these 2 trials? One possibility is that the norms around anal sex may have changed over the 5 years between these studies, and the data may reflect a true behavior change. This possibility is supported by similar findings over the same period in the Great Britain and Seattle studies. Another possibility is the difference in the interview technique, in-person interview versus ACASI, which may have affected participants' willingness to report anal sex. Although ACASIs were originally hypothesized to lead to more accurate reporting of sensitive behaviors, later evaluation studies have been less conclusive.[11–13] Differences in enrollment criteria between the 2 studies may also have contributed to differences in anal sex; to be eligible for enrollment into Project RESPECT, only vaginal sex was required, but enrollment into RESPECT-2 allowed for heterosexual participants to report either vaginal or anal sex. However, only 3 heterosexual participants in RESPECT-2 reported only anal sex. A fourth possibility is that asking questions specific to the last 3 partners in the second trial may have led to differential recall when compared with asking about all partners combined. Finally, although they both asked about the same behavior over the same time period, some of the observed differences may be a result of changing the question format from "Have you ever . . ." to "How many times did you . . ." Small changes in question wording have been noted to lead to large differences in interpretation and response.[14] The high-level introductory "Have you ever" question used in the first study may have carried a social acceptance connotation and made respondents less likely to answer honestly. Removing this trigger question in the second study and only asking "How many times" may have led to a lack of emphasis on any social desirability standpoint.

We did not ascertain the proportion of participants reporting having ever had anal sex in the second trial. In the first trial, 28% reported any lifetime anal sex, which is considerably higher than the proportion that had anal sex in the preceding 3 months (9%). This suggests that the differences in anal sex in the past 3 months might represent a change in frequency rather than an increase in the number of people who have ever had anal sex. In either case, the high number reporting recent anal sex suggests that clinicians should ask all patients about anal sex and consider testing women for rectal chlamydia and gonorrhea infection. Unfortunately, there are limited chlamydia and gonorrhea testing options for rectal specimens, so additional testing options are needed. In addition, unprotected anal sex increases the risk for other sexually transmitted infections, such as HIV and HPV.[15,16]

We also found a substantially lower prevalence of bacterial STD among participants in the second trial, RESPECT-2, compared with the initial Project RESPECT conducted 5 years earlier. Al-

though there were variations in the test types used to diagnose STDs between the 2 studies, the sensitivities of the tests were similar. Thus, the decreases we observed are likely to be real and not attributable to differences in measurement techniques. National trends in reported cases of gonorrhea and syphilis also declined over these time periods, although chlamydia prevalence did not appear to have declined nationally.[17] This suggests that other factors, besides the sexual risk behaviors we measured, are likely to be important factors in determining STD prevalence among STD clinic attendees. Alternatively, the changes in STD prevalence may represent a shift in the populations accessing care at the 3 clinics over the 5-year interval; the population captured by RESPECT-2 may have been at slightly lower risk for an STD than the RESPECT population, as possibly evidenced by their higher employment and education rates. Other population changes not evident in the demographic and risk factor comparisons may also have occurred.

Our study has some limitations. Behavioral data were based on self-report, and data collection methods varied between the 2 trials, in-person interview versus ACASI. Both the data collection method and the difference in question wording make interpreting reported anal sex difficult. In addition, although the populations appeared similar demographically, populations may have varied over time on characteristics not assessed. Also, more limited behavioral data were collected in the second study, and thus we were not able to look at possible differences in oral sex, specific drug use, or possible explanatory variables such as history of incarceration. Our population included only English-speaking, heterosexual patients who agreed to participate in a study and thus may not be generalizable to the larger STD clinic population. MSM, traditionally a high-risk group, were not included.

This analysis has 2 important public health implications. First, given the constraints of large, national behavioral surveys, monitoring STD risk behaviors in an STD clinic population is feasible and appropriate for measuring risk behaviors in a risky group. It is possible to collect behavioral data as a supplement to existing services and may be more acceptable to ask questions about sensitive behaviors in the context of clinical services rather than in national surveys. Second, despite intensified general prevention messages during the 1990s focusing on exclusive partnerships, condom use, and STD/HIV check-ups, we did not find evidence that specific safe sex behaviors improved appreciably in heterosexual STD clinic participants at these 3 large urban clinics. In particular, heterosexual men and women attending US STD clinics appear to be engaging in more anal sex than in the past; 17% of men and 18% of women in this analysis reported unprotected anal sex in the past 3 months. Health care providers should ask patients about anal sex, consider anal infections during the physical exam, and provide prevention messages about safer anal sex.

References

1. Crepaz N, Hart TA, Marks G. Highly active antiretroviral therapy and sexual risk behavior. JAMA 2004; 292:224–236.
2. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Available at: http://www.cdc.gov/brfss. Accessed September 15, 2006.
3. Centers for Disease Control and Prevention. National Health and Nutrition Examination Survey. Available at: http://www.cdc.gov/nchs/nhanes.htm. Accessed September 15, 2006.
4. Centers for Disease Control and Prevention. National Survey of Family Growth. Available at: http://www.cdc.gov/nchs/nsfg.htm. Accessed September 15, 2006.
5. Johnson AM, Mercer C, Erens B, et al. Sexual behavior in Britain: Partnerships, practices, and HIV risk behaviors. Lancet 2001; 358: 1835–1842.
6. Kamb M, Fishbein M, Douglas J Jr, et al. Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: A randomized controlled trial. JAMA 1998; 280:1161–1167.
7. Metcalf CA, Douglas JM Jr, Malotte K, et al. Relative efficacy of prevention counseling with rapid and standard HIV testing: A randomized, controlled trial (RESPECT-2). Sex Transm Dis 2005; 32:130–138.
8. SAS [computer program]. Version 9.1.3. Cary, NC: SAS Institute Inc., 2002–2003.
9. Catania JA, Canchola J, Binson D, et al. National trends in condom use among at-risk heterosexuals in the United States. J Acquir Immune Defic Syndr 2001; 27:176–182.
10. Aral SO, Patel DA, Holmes KK, et al. Temporal trends in sexual behaviors and sexually transmitted disease history among 18- to 39-year-old Seattle, Washington, residents: Results of random digit-dial surveys. Sex Transm Dis 2005; 32:710–717.
11. Kissinger P, Rice J, Farley T, et al. Application of computer-assisted interviews to sexual behavior research. Am J Epidemiol 1999; 149: 950–954.
12. Turner CF, Ku L, Rogers SM, et al. Adolescent sexual behavior, drug use, and violence: Increased reporting with computer survey technology. Science 1998; 280:867–873.
13. Johnson AM, Copas AJ, Erens B, et al. Effect of computer-assisted self-interviews on reporting of sexual HIV risk behaviors in a general population sample: A methodological experiment. AIDS 2001; 15:111–115.
14. Stevens-Simon C, Beach RK, Klerman L. To be rather than not to be—That is the problem with the questions we ask adolescents about their childbearing intentions. Arch Pediatr Adolesc Med 2001; 155: 1298–1300.
15. Varghese B, Maher JE, Peterman TA, et al. Reducing the risk of sexual HIV transmission: Quantifying the per-act risk for HIV on the basis of choice of partner, sex act, and condom use. Sex Transm Dis 2002; 29:38–43.
16. Sobhani I, Walker F, Roudot-Thoraval F, et al. Anal carcinoma: Incidence and effect of cumulative infections. AIDS 2004; 18:1561–1569.
17. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance, 2004. Atlanta, GA: U.S. Department of Health and Human Services, 2005.