Smoking Among Lesbians, Gays, and Bisexuals
A Review of the Literature
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Objectives
To collect estimates of smoking prevalence among lesbian, gay, and bisexual people from the published literature and to compare with general population estimates.

Methods
Databases were searched for all studies published in English on tobacco use among lesbians, gays, and bisexuals. From 1987 through 2000, twelve studies were identified (four youth, eight adult): seven were based on convenience samples; one on a population-based probability sample; one involved random sampling within selected census tracts; one was based on a large multi-center clinical trial; and two were representative school-based samples. Study findings were compared to national survey data from the corresponding time period.

Results
Estimated smoking rates for lesbians, gays, and bisexuals ranged from 38% to 59% among youth and from 11% to 50% among adults. National smoking rates during comparable periods ranged from 28% to 35% for adolescents and were approximately 28% for adults.

Conclusions
While information in the published literature is limited, it appears that smoking rates are higher among adolescent and adult lesbians, gays, and bisexuals than in the general population. Steps should be taken to ensure representation of lesbians, gays, and bisexuals in tobacco-use surveillance and to collect data in order to understand the apparent high smoking rates in these groups. Attempts should be made to target prevention and cessation interventions to lesbians, gays, and bisexuals.

Medical Subject Headings (MeSH): bisexuality; homosexuality, female; homosexuality, male; prevalence; review literature; smoking; tobacco (Am J Prev Med 2001 ;21 (2) :142-149) @ 2001 American Journal of Preventive Medicine

Introduction
Numerous factors suggest that lesbians, gays, and bisexuals may be at risk for high smoking prevalence. First, like other economically and socially marginalized communities, lesbians, gays, and bisexuals may face a disproportionate amount of daily stress due to homophobia and discrimination. Smoking has been found to be more prevalent among groups that experience high levels of stress. 1, 2 Second, places where smoking is prevalent, such as bars, have historically been an important social focus for lesbians, gays, and bisexuals possibly because of a history of exclusion or discrimination in other social settings, 3 and may continue to play an important role, at least for some segment of this population. Third, behaviors associated with
smoking, such as alcohol and drug use, may be higher among lesbians, gays, and bisexuals than among their heterosexual counterparts. Finally, evidence suggests that since the 1980s, the tobacco industry has targeted the gay market through direct advertisement, sponsorship, and promotional events. The factors that influence smoking among lesbian, gay, and bisexual adolescents may be more complex than the factors influencing adults. Smoking among youth in general is related to the effects of modeling, social desirability, ready access to cigarettes, risk taking and rebelliousness, feelings of being unsupported, low self-esteem, negative mood states, and other mental health factors. Research suggests that lesbian, gay, and bisexual youth are more likely to be depressed or lonely, to attempt suicide, and to be physically and verbally victimized than heterosexual youth, factors that likely contribute to increased substance use. Although the role played by other factors has yet to be documented, additional reasons why smoking prevalence may be higher for lesbian, gay, and bisexual youth than youth in general include the possible and unique role that smoking may play during identity formation among lesbian, gay, and bisexual adolescents (e.g., assumption of masculinity for males, assertion of independence and power for females); the stresses of "coming out", the potential lack of support from parents, other family members, and peers; feelings of isolation and loneliness; and anti-gay harassment or victimization.

Several recent studies have collected information on smoking in gays and lesbians, generally as a part of a broader examination of health-related issues and often based on convenience samples. The objective of this report is to critically review and summarize the published literature on smoking among adolescent and adult lesbians, gays, and bisexuals; to describe smoking prevalence among these groups; and to compare these estimates with national survey estimates.

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**Methods**

Searches were carried out for articles published in English pertaining to tobacco use and lesbian, gay, and bisexual people. Databases that were searched included the Office on Smoking and Health database (1960-mid-2000), MEDLINE (1966-mid-2000), Psych Info (1967-mid-2000), Current Contents/Life Sciences (1999-mid-2000), Current Contents/Social and Behavioral Science (1999-mid-2000), ERIC (1966-mid-2000), and EMBASE (1974-mid-2000). In addition, we reviewed the references of all articles identified and sent annually to the Internet list serve of the Society for Research on Nicotine and Tobacco to solicit additional information. Key words used to search were gay, lesbian, homosexual, bisexual, transgender, and sexual orientation in combination with smokeless, tobacco, cigarette, cigar, smoking, habit, prevalence, epidemiology, and addiction. Of major interest were prevalence studies that provided information on tobacco use in the target groups. Eighteen articles on the relationship between tobacco use and progression of HIV / AIDS and 17 articles on tobacco advertising in the lesbian, gay, and bisexual communities were found but not included.
No articles addressing tobacco use by transgender people were found. Thirteen articles published between 1987 and 2000 were found that provided at a minimum a measure of any aspect of tobacco use among lesbians, gays, and bisexuals. Two of these articles were based on the same study and are presented together. Therefore, a total of 12 studies are reviewed here.

Information from the articles was entered into two separate tables: (1) adolescents and young adults aged 13 to 21 and (2) adults. The tables include author and year, design and sample size, demographics of surveyed population, results regarding tobacco use, and comparison data from general population surveys for the corresponding period. None of these studies focused solely on tobacco use; all addressed multiple health topics.

**Results**

**Adolescents / Young Adults**

Four studies examining smoking among lesbian, gay, and bisexual adolescents and young adults aged 13 to 21 were conducted between the early 1980s and 1995 (Table 1). Two of the studies were statewide school-based surveys conducted in Massachusetts, and two recruited adolescents through advertisements or community-based agencies. All included bisexual youth, but none reported separately on them. Two studies used standard definitions of smoking for adolescents (smoked on >1 day in the 30 days preceding the survey).

The school-based data were from the Youth Risk Behavior Survey, a two-stage cluster sample design that produces representative samples of students in grades nine to twelve in their jurisdictions; the questionnaire is self-administered, voluntary, and anonymous. Participating states and cities have the ability to add questions of local interest. Massachusetts was the first state to add a question on same-gender sexual behavior in 1993; questions on sexual orientation were added in 1995. The prevalence of current smoking (smoked cigarettes on >1 of the 30 days preceding the survey) was 38% for students with same-gender sexual experience and 59% for students who self-identified as lesbian, gay, and bisexual youth. When students with same-gender sexual experience were compared with those who reported exclusively heterosexual sexual experience (i.e., sexually inexperienced students were excluded), the prevalence of current tobacco use was approximately the same (38.2% and 41.5%, respectively) and higher than among all students nationally (30.5%). When students who self-identified as lesbian, gay, or bisexual were compared with students who self-identified as heterosexual (regardless of whether they were sexually experienced), the prevalence of current smoking was higher among the lesbian, gay, and bisexual students (59.3%) than among the heterosexual students in Massachusetts (35.2%) and students nationally (34.3%). Neither study considered self-identification and sexual behavior together. Garofalo et al. also examined smokeless tobacco use and found that it was higher among lesbian, gay, and bisexual youth (33.7%) compared with students who self-identified as heterosexual (7.7%)

The two remaining studies were based on small convenience samples, the first of which measured current daily smoking and the second measured ever smoking, but not current smoking. In the former, the prevalence of current daily smoking among
young gay and bisexual males was higher than daily smoking among males aged 17 to 18 years in the general population during the same time period; in the latter, the prevalence of ever smoking was slightly, higher for lesbian and bisexual females compared with female students nationally, but not for gay and bisexual males. Unlike the school-based studies, neither of these studies had built-in comparison groups.

Table 1. Studies with information on smoking prevalence in lesbian, gay, and bisexual (LGB) adolescents/young adults

<table>
<thead>
<tr>
<th>Author comparison</th>
<th>Study design</th>
<th>Sample demographics</th>
<th>Findings</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remafedi (16)</td>
<td>Interview study; recruitment through study advertisements</td>
<td>Age: 15-19 yr, “white, middle class,” Twin defined: 48%</td>
<td>Current smokers (not defined): 48%</td>
<td>1980</td>
</tr>
<tr>
<td>Monitoring the Future (22) students aged 17-18 yr in the early 1980s (year not specified) N =29 self-identified smokers*. 26.8% smokers: 19% young gay and bisexual men (79% gay, 21% bisexual); response rate not provided</td>
<td>Cities, MN</td>
<td>All smoked daily</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td>Rosario et al. (17) Youth Risk Behavior</td>
<td>Interview study;</td>
<td>Age: 16-21 yr</td>
<td>Ever smoked:</td>
<td>1993</td>
</tr>
<tr>
<td>Study</td>
<td>Design</td>
<td>Participants</td>
<td>Smoking Status</td>
<td>Characteristics</td>
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<tr>
<td>Faulkner et al. (20)</td>
<td>Cross-sectional, randomized public school-based survey (1993 Massachusetts Youth Risk Behavior Survey)</td>
<td>N = 154 self-identified LGB youth (76 female, 78 male, 31% bisexual, 66% lesbian and gay)</td>
<td>Current smokers (a)</td>
<td>Females: 13.1 yr, Males: 13.4 yr</td>
</tr>
<tr>
<td>Garofalo et al. (21)</td>
<td>Cross-sectional, randomized public school-based survey (1995 Massachusetts Youth Risk Behavior Survey)</td>
<td>N = 105 students who reported same-sex contact (45% female, 55% male), 1563 with exclusive heterosexual contact; response rate 70%</td>
<td>Initiation of smoking before age 13</td>
<td>47.9% of LGB students; 23.4% of heterosexual students</td>
</tr>
</tbody>
</table>

a Smoked on 2:1 day in the 30 days preceding the survey.
b More than six times ever.
c Daily in the past 30 days.
d Used on 2:1 day in the 30 days preceding the survey.
*p Smoked/used on 2:1 day in the 30 days preceding the survey.

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Adults

Eight studies based on surveys conducted between 1984 and 1998 examined smoking among adults: two among gay men, five among lesbians, and one in both groups (Table 2). Study respondents were classified as gay or lesbian on the basis of self-identification in seven of the eight studies and on the basis of reported behavior in one study. Although the majority of studies included bisexual people, only two studies presented results separately for this group. Current smoking was not defined in four of the eight studies, and three of the remaining four used definitions different from the standard definition for adults. Overall, the respondents surveyed tended to be white, in their 30s, and college educated. In most cases, the demographic characteristics of the samples surveyed were markedly different from those of the general population and even of built-in comparison groups when available, especially with respect to educational attainment (a strong predictor of smoking). The prevalence of smoking ranged from 25% to 50% in gay and bisexual men, and from 11% to 50% in lesbian and bisexual women. The rates were higher than those seen in the general adult population during the same time period in all but one study, which involved a survey of lesbians attending a health conference and responding to a community newsletter survey. Diamant et al. analyzed data from a population-based sample obtained using random-digit-dialing techniques in Los Angeles County. The purpose of the study was to examine key indicators of health and included a question about sexual orientation. Of the 4697 women included in the analysis, 51 (1%) self-identified as lesbian and 36 (0.8%) as bisexual. Women who self-identified as lesbian (37%) or bisexual (50%) smoked at higher rates than the heterosexual women (14%) in the survey and women in the general population (22%). Stall et al. utilized a modified population-based approach, conducting a phone survey of 696 randomly selected gay and bisexual men residing in predetermined census tracts in Portland and Tucson.

This study presented smoking rates within racial/ethnic groups and education categories. Smoking in gay and bisexual men decreased as educational attainment increased, as it does in the general population, but gay and bisexual men smoked at significantly higher rates across all education categories; college graduates smoked at levels comparable to those of high school graduates in the general population (36.8% and 33.5%, respectively).

Among the studies based on convenience samples, respondents included readership of gay and lesbian magazines and newsletters, people on mailing lists of gay and lesbian organizations, users of an Internet bulletin board, men attending gay bars, and women attending a lesbian healthcare conference. The number of people surveyed ranged from 204 to 6935. None of these studies presented rates for demographic subgroup; however, reported smoking prevalence was generally close to general population smoking rates for high school graduates even though the samples disproportionately included college graduates.

Finally, participants in the Women's Health Initiative, a large multi-center study of postmenopausal women (over 90,000 participants), were asked about the gender of their sexual partners in the questionnaire.
administered prior to enrollment into the clinical trials or the observational cohort. A total of 573 (0.6%) were classified lesbian, and 740 (0.8%) as bisexual. The prevalence of smoking was higher among lesbians (10% to 14.4%) than among the heterosexual women (7.2%) in the study and in the general population (6.5%), even though almost two thirds of the study sample were college graduates.

**Discussion**

The amount of information available in the published literature on smoking among gays, lesbians, and bisexuals is limited. The definitions used to determine sexual orientation and tobacco use vary among studies. In addition, trend information is not available and information on transgender people is absent. Because the studies reviewed here were typically designed to collect information across a broad range of health and social issues, information on smoking was generally limited to prevalence and did not address some of the standard issues, such as initiation, smoking patterns, and quitting behaviors. Moreover, seven of twelve were based solely on convenience samples; of the remainder, only three represent population-based samples. Considered together, however, these studies strongly suggest that the prevalence of smoking may be higher among adolescent and adult lesbians and gay males than in the general population. Prevalence was consistently higher than in the general population comparison data, even though samples surveyed tended to have a higher educational attainment, a strong predictor of low smoking rates in the general population.

Sexual orientation has not been defined in a consistent manner across studies and is sometimes used interchangeably with sexual behavior, limiting comparability across studies. The discrepant results observed between the two school-based Massachusetts surveys may be attributed in part to differences between students who self-identify as lesbian, gay, or bisexual and those who report same-gender sexual activity. In addition, they may be attributed to differences between students who are sexually experienced and those who are not (the latter were included in Garofalo et al.’s (19) analysis, but excluded in Faulkner’s). These results suggest that sexually experienced students (regardless of partner’s gender) may share some risk-taking characteristics and that students who self-identify as lesbian, gay, or bisexual are to some extent a different sub-group, with the highest rate of smoking. Further analysis of these data, including both sexual orientation and sexual behavior, might allow us to better tease out the characteristics of these different groups of youth. Similarly, studies among adults should collect information on both behavior and self-identification, as such information is important for identifying those groups with the highest rates of smoking and may be important for the targeting of messages and interventions.

One of the main challenges to conducting research on lesbians, gays, and bisexuals is the difficulty in obtaining a population-based sample to survey. Only three of the twelve studies were based on population samples; in these studies, the number of respondents reporting same-gender sexual activity or self-identifying as lesbian, gay, or bisexual was too small for in-depth analysis. Most studies were based on convenience samples, such as people recruited from lesbian and gay community groups or gay or lesbian magazine readership. Although these findings may be generalizable to lesbians, gays, and bisexuals who attend community events or subscribe to gay newspapers or magazines, they may not be generalizable to the entire population of lesbians, gays, and bisexuals. The random survey of households in census tracts with high proportions of gay and bisexual men provides a stronger
methodology than convenience samples, although the degree to which findings can be
generalized beyond gay men who live in areas with a dense population of gay men is
unknown.26 Importantly, this approach yields with less effort, larger numbers of
participants than population-based surveys. Such a methodology may be less useful to
study lesbians, however, as they tend to be more geographically dispersed than gay
men.35

Obtaining reliable and valid information on smoking and other health indicators in this
population and on the interrelationships among health behaviors is an important goal
for future studies. The identification of lesbians, gays, and bisexuals as one of six
populations experiencing health disparities in Healthy People 2010 36 and the inclusion
of several objectives specific to sexual orientation are acknowledgments that such
data are needed. Several steps can be taken to begin addressing these data needs.
First, adding questions on sexual orientation to large, national health-related surveys
already in use would provide information on a population-based sample, particularly
in surveys that assure anonymity. Given the low percentage of people who are gay,
lesbian, or bisexual, and the fact that some may not disclose their sexual orientation,
large-scale surveys are needed to obtain samples with meaningful numbers of lesbian,
gay, and bisexual respondents. Including such questions in the National Health
Interview Survey, for example, would yield a relatively large number of people self-
identifying as lesbian, gay, or bisexual, especially over the course of a few years (an
estimated 650 per year if 2% of respondents self-identify as lesbian, gay, or bisexual).
Questions about gender of sexual partner (but not sexual orientation) have already
been included in at least one national population-based survey: the 1996 National
Household Survey on Drug Abuse.37 In addition, several states and cities have recently
added questions on sexual orientation or sexual behavior to the Youth Risk Behavior
Survey or the Behavioral Risk Factor Surveillance System (including Maine,
Philadelphia, San Francisco, and Vermont). Second, these questions need to be
standardized to ensure comparability of data across surveys and should address both
self-identity and sexual behavior to capture people who may not identify themselves
as lesbian, gay, or bisexual. Third, because even large-scale national surveys may not
yield sufficient numbers of lesbian, gay, and bisexual respondents for detailed
analysis, alternative survey methods need to be developed and implemented that
allow the collection of valid and reliable information from the largest number of
lesbian, gay, and bisexual people as possible. Assessing the feasibility of over sampling
through screening and understanding how populations surveyed through geographically
targeted studies are different from population-based samples are some important
areas for further investigation.

Although targeted advertisement to the gay market and tobacco sponsorship of
community events is ongoing, 10-12,38 only limited funding for smoking prevention and
treatment efforts is directed toward the lesbian, gay, and bisexual community, and
virtually no research has focused specifically on prevention or treatment for this
population. Research is needed to better understand the factors that contribute to
these rates and on how these can be intervened. As with interventions directed at
other minority populations, 39,40 programs that are culturally appropriate for lesbian,
gay, and bisexual people must be designed, implemented, and evaluated and the
information disseminated. Similarly, antismoking campaigns specifically targeting this
population are necessary. Finally, finding ways to accurately monitor tobacco use in
lesbians, gays, and bisexuals in an ongoing manner, to collect the in-depth
information needed to understand patterns of tobacco use, and to evaluate the impact of prevention and treatment efforts is critical.
Table 2. Studies with information on smoking prevalence in lesbian, gay, and bisexual (LGB) adults

<table>
<thead>
<tr>
<th>Author</th>
<th>Study design</th>
<th>Sample demographics</th>
<th>Findings</th>
<th>National Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bradford et al.</td>
<td>Self-administered mail survey, recruitment by mail and through unpublished data</td>
<td>80% aged 25-44 yr</td>
<td>Current smokers (not defined): 41%</td>
<td>Women</td>
</tr>
<tr>
<td>(23) 1985 National Health Survey (CDC, Survey who were current 33.5% educational level: high school: 39.6% school: 37.5%; college: 34.6%; college rate 42%</td>
<td>88% white</td>
<td>Daily smokers: 30%</td>
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</tr>
<tr>
<td>Nieto (24)</td>
<td>Internet-based survey of users of a computerized gay bulletin board system, 1993</td>
<td>Majority 31-40 yr</td>
<td>Current smokers (not defined): 25%</td>
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<tr>
<td>National Health Survey (30)</td>
<td></td>
<td></td>
<td>Men who reported &quot;light&quot; frequency of use (not defined)</td>
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<tr>
<td>were current 27.7% educational level: high school: 42.1%; school: 32.0%; college: 28.4%; college rate 49%</td>
<td>73% &gt;college</td>
<td>69% reported &quot;light&quot; smokers:</td>
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<tr>
<td>Skinner and Otis (15)</td>
<td>Self-administered mail survey, recruitment from mailing lists of lesbian and gay organizations, late 1980s (year not specified) (Men Women specified) (Analysis of N=1067 self-identified subsample in lesbians and gay men 47% lesbian and 53% gay men)</td>
<td>Mean age: 34.4 yr</td>
<td>Ever smoked: 77.4% of lesbians and 66.8% of men and women</td>
<td>Interview</td>
</tr>
<tr>
<td>Self-administered mail survey, recruitment from mailing lists of lesbian and gay organizations, late 1980s (year not specified) (Men Women specified) (Analysis of N=1067 self-identified subsample in lesbians and gay men 47% lesbian and 53% gay men)</td>
<td>93% white gay men</td>
<td>Mean education: 15.2 yr Smoked in the past year: Current lesbians: 47.8%; gay men: 39.7%</td>
<td>Interview</td>
<td></td>
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<tr>
<td>Skinner (14)</td>
<td>Mean urban or suburban</td>
<td>The two largest cities located in a southern state (not specified) month:</td>
<td>High school</td>
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<tr>
<td>Otis (15)</td>
<td>80% urban or suburban</td>
<td>The two largest cities located in a southern state (not specified) month:</td>
<td>High school</td>
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<tr>
<td>1988 National Health Survey (31)</td>
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<td>Smoked in the past: Current</td>
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<td>smoking by gender</td>
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<tr>
<td>education:</td>
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<td>14.8%</td>
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<td>39.9</td>
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<td>35.4</td>
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<td>16.9</td>
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<td>30.8</td>
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White and Dull (25)
National Health Survey (32)
who were current
28.2%
conference and mail
survey of readership
of lesbian Oregon
Community Project newsletter, 1994
education:
N=324 self-identified cigarettes/ day
lesbian and bisexual
years: 32.1%
school: 27.3%
rate 50% for
College: 23.3%
conference
participants, 27% for
mail-survey respondents
Stall et al.(26)
National Health survey (32)
recruitment at gay
bars, and telephone
sample of gay and
were current
bisexual men, in
census tracts with
education:
concentration of
9-11 years: 40.3%
High School: 33.5%
men, 1992
Some college: 26.4%
>College: 17.1%
N=2593 self-identified gay and bisexual men college
(897 bar sample and 696 household sample)
"Cooperation rate" estimated at 59%-75%
Tucson AZ, Portland OR
Valanis et al. (27)
National Health Survey (CDC unpublished data)
Survey of postmeno-
pausal women partic-
ipping in the observa-
tional cohort and
clinical trials of the
smokers:
Women's Health Initiative in clinical centers throughout
the U.S., enrolled 1993-1998
N =264 lifetime
45-64: 47.8%
lesbians(sex only with women ever),
>65: 38.4%
309 adult lesbians
(sx only with women after age 45), 740
White and Self-administered
Mean age: 41 yr
Current smokers (not defined): 11%
Women
17% of current smokers tried to quit in past year
Ever smokers (c)
L B H
Mean age 58 60 62
Lifetime lesbian: 63.5%
Adult lesbian: 70.0%
Bisexual: 68.0%
Heterosexual: 50%
Current smokers (d)
Women
Lifetime lesbian: 10.0%
Adult lesbian: 14.4%
Bisexual women (sex with both men and women), and 90,578 heterosexual women (sex only with men)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Bisexual: 1.2%</th>
<th>Heterosexual: 7.2%</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-64</td>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>&gt;65</td>
<td>Women</td>
<td></td>
</tr>
</tbody>
</table>

Diamant et al. (28) Telephone survey of population based on random digit dialing of women in Los Angeles County, CA; 1997

<table>
<thead>
<tr>
<th>Education</th>
<th>Lesbian: 37%</th>
<th>Bisexual: 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;HS</td>
<td>Women</td>
<td></td>
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<tr>
<td>HS</td>
<td>Women</td>
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<td>&gt;8 yr.</td>
<td>Women</td>
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</tbody>
</table>

Diamant et al. (29) Respondents to questionnaire printed in national magazine, 1995

<table>
<thead>
<tr>
<th>Education</th>
<th>Lesbian (bisexual women excluded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;8 yr.</td>
<td>Women</td>
</tr>
<tr>
<td>9-11 yr.</td>
<td>Some</td>
</tr>
</tbody>
</table>

References
37. Cochr an SD, Mavs \M. Relation between psychiatric syndromes and behaviorally defined sexual orientation in a sample of the U.S. population Am] Epidemiol2000;151:516-23
38 Gules and Associates. Exploratory qualitative research: Benson and Hedges in the gay market. Available at: www.pmdocs.com [search criteria: market and gay and report]. Accessed April 28, 2000