

## Minority Women Can Benefit from Ethnically Tailored Programs to Reduce Sexually Transmitted Disease Risk

Black and Mexican American women who participated in ethnically tailored behavioral interventions to prevent sexually transmitted disease (STD) had lower risks of subsequently acquiring gonorrhea or chlamydia than those receiving usual counseling in a randomized study in Texas.<sup>1</sup> Although the interventions lasted no more than months, participants sustained a 50% reduction in the odds of infection over two years. Women in the intervention groups also were less likely than their counterparts in the control group to have multiple partners or to have unprotected intercourse with an untreated or incompletely treated partner—two risky behaviors that were related to higher rates of infection.

Minority women visiting public health clinics in San Antonio were eligible for the study if they had a nonviral STD (gonorrhea, chlamydia, syphilis or trichomoniasis), spoke English and were 15–45 years old. Women were enrolled in the study between March 1996 and June 1998, within one month of treatment. All received 15–20 minutes of individual STD counseling. They were then assigned to a control group (no intervention), a group given a behavioral intervention (three weekly small-group sessions tailored according to ethnographic data and conducted by female facilitators of the same ethnicity, each lasting three hours) or a group given an enhanced behavioral intervention (the standard intervention plus five optional monthly support group sessions, each lasting 90 minutes). The interventions emphasized assessing one's own risk of acquiring STDs, adopting healthy behavior and seeking care for suspected infections. Six months, one year and two years after starting the study, the women were interviewed and had a physical examination with screening for infections; screenings and diagnoses at other clinics were also ascertained.

Analyses were based on 775 women. Most (80%) were younger than 25. Three-fourths were Mexican American, and one-fourth were black. Fewer than 10% were married, and roughly two-thirds had had more than one sexual partner in the past year. On average, the

women had had 11 years of education, and monthly per capita income was about \$300. The control group differed from the intervention groups on a number of STD risk factors. Notably, significantly smaller proportions of women in the control group than of those receiving an intervention were teenagers (46% vs. 55–58%), had chlamydia infection (73% vs. 79–82%) and had at least two STD screenings beyond those routinely provided in the study (22% vs. 35–37%). According to women's reports of their alcohol and drug use, roughly one-third had a high or ultrahigh risk of substance abuse; women in the control group were the most likely to have a low or moderate risk, and the least likely to have an ultrahigh risk.

An initial analysis revealed that the two-year cumulative rate of infection with gonorrhea or chlamydia increased steadily from 29% among women with a low or moderate risk of substance abuse to 74% among those with an ultrahigh risk. Thus, the researchers conducted an analysis of STD infection stratified by substance abuse risk. In this analysis, the interventions were associated with reduced odds of infection only for women with a low or moderate risk of substance abuse (odds ratio, 0.4 for each intervention).

In the study group overall, cumulative two-year rates of gonorrhea or chlamydia infection, adjusted for substance abuse risk and other risk factors, were 40% in the control group and 24–26% in the intervention groups. The differences corresponded to a 50% reduction in odds among women in the intervention groups (odds ratio, 0.5 for each). Similar reductions in odds occurred during the first year (0.5 for each) and during the second year (0.6 for each) individually.

Within the enhanced intervention group, 37% of women attended at least one of the optional support group sessions. The two-year rate of infection was 22% among support group attendees and 25% among nonattendees; corresponding reductions in the likelihood of infection relative to women in the control group amounted to 50% or more (odds

ratios, 0.4 and 0.5, respectively). Among attendees, the benefit decreased somewhat between the first and second years.

In the control group, 17% of women had an infection diagnosed at least once during the two-year period; by contrast, the proportion was only 8% in the standard intervention group and 7% among women receiving the enhanced intervention. The odds of this outcome were reduced in the intervention groups (odds ratios, 0.5 and 0.4, respectively). Within the enhanced intervention group, the rate of repeat infections was 6% among support group attendees and 8% among nonattendees; again, odds were reduced by at least half when compared with odds for the control group (0.4 and 0.5).

Women who engaged in unprotected sex with a partner who was untreated or incompletely treated were more likely to become infected than women who did not (38% vs. 22%). This risky behavior was less prevalent in the intervention groups (8–10%) than in the control group (18%). Similarly, women who had more than one sexual partner during the study were more likely to become infected than those who had one or none (47% vs. 16%). This risky behavior was likewise less prevalent in the intervention groups (63–69%) than in the control group (76%). Within the enhanced intervention group, rates of both risky behaviors were somewhat lower among support group attendees than among nonattendees.

Overall, the two interventions were similarly effective for preventing gonorrhea and chlamydia, the researchers assert. They note that the added benefit of support group attendance lessened over time, underscoring the importance of both removing barriers to attendance and offering “continuing or booster meetings.” The researchers conclude that although changes in rates of HIV infection could not be reliably assessed in the study, and evidence directly linking STD and HIV prevention is lacking, “behavioral risk reduction that disrupts heterosexual transmission of bacterial pathogens could also prevent heterosexual transmission of HIV.”—S. London

## REFERENCE

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## Venous Thromboembolism Risk Is Sharply Elevated For Users of Combined Pills

Women who use oral contraceptives containing progestin and a low dose of estrogen have an increased risk of venous thromboembolism—a blood clot that forms in the veins of the legs and may detach and travel to the lungs.<sup>1</sup> In a population-based case-control study conducted in California, women who currently used this type of pill had odds of venous thromboembolism that were four times those of women who did not; their odds were three times those of women who had never used such pills. The risk of disease was elevated among current users, regardless of the progestin type (odds ratios, 3.4–5.1).

To investigate the link between combined pills containing fewer than 50 mcg of estrogen and the risk of venous thromboembolic disease, researchers identified women aged 18–44 who were members of the Kaiser Permanente Medical Care Program and, according to medical records and claims data, had been treated for a possible episode of venous thromboembolism between March 1998 and June 2000. The researchers held interviews with the women to collect information on pill use, demographic characteristics, height and weight, medical history, family history of venous thromboembolism, any prolonged periods of immobilization in the previous six months (e.g., overnight hospitalization or an airplane ride lasting four hours or longer), smoking, and use of alcohol, aspirin and vitamins. The study also included randomly selected women from the same medical program as controls.

In all, 196 interviewees in the study group had had a probable and first-time case of venous thromboembolism, were not pregnant, were fecund and were not using an oral contraceptive containing 50 mcg or more of estrogen. Some 44% of these women and 18% of the 746 controls were currently using combined pills that contained a low dose of estrogen. The average duration of pill use was roughly five years for both groups of women. Some 51% of women in the study group were obese (body mass index of more than 30

kg/m<sup>2</sup>), compared with 28% of controls.

After adjustment for age, multivariate logistic regression analysis revealed that the higher a woman's body mass index, the higher her risk of venous thromboembolism: Women with a body mass index of at least 25 kg/m<sup>2</sup> were more likely than others to have had a venous thromboembolism (odds ratios, 1.8–3.5); in general, odds were elevated by 8% per kg/m<sup>2</sup>. Odds of venous thromboembolism also were positively associated with current use of pills and having a family history of the disorder, as well as having experienced prolonged immobilization and having had a possible predisposing health problem (e.g., stroke, heart attack or a clotting disorder) in the previous six weeks (1.7–5.9). In contrast, the odds of venous thromboembolism decreased by 2% per year of age and 6% per year of pill use. Odds also were negatively associated with being a current smoker, regular physical activity, vigorous physical activity at least once a week, being Hispanic or Asian, being or having been married, having an annual income of at least \$20,000, having used aspirin in the previous week and having had at least one child (0.2–0.7).

After adjustment for age, race and ethnicity, income and body mass index, women who currently used the pill were significantly more likely than those who did not to have had a venous thromboembolism (odds ratio, 4.1). Current users were also more likely to have had this condition than were women who had never used the pill (3.2). The odds of venous thromboembolism were elevated regardless of the duration of current pill use: The odds ratio was 5.4 for women who had used the pill for fewer than 12 months, 5.7 for those who had used it for 12–59 months and 3.1 for those who had used it for 60 months or more. However, women who had ever used the pill were as likely as those who had never done so to have developed a venous thromboembolism.

In additional adjusted analyses, the increase in odds of venous thromboembolism associated with current pill use was significantly higher among women with a body mass index of more than 30 kg/m<sup>2</sup> than among others (odds ratios, 6.0 vs. 3.3), and among women who did not have a predisposing medical condition than among those who did (7.8 vs. 1.9)—a somewhat surprising finding, according to the analysts. However, the increase in the risk of venous thromboembolism associated with current pill use among women who used pills containing norethindrone was similar to that

among women who used pills containing levonorgestrel (3.4 and 5.1).

The researchers comment that their findings are consistent with those of other studies showing a 300–400% increase in the risk of venous thromboembolism among current users of pills with a low estrogen concentration, especially in the first year of use. Furthermore, noting that roughly half of the women who had had a venous thromboembolism were obese, the analysts conclude that the interaction between obesity and pill use is particularly “noteworthy” in light of the current epidemic of obesity in the United States.

—T. Lane

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## Disease Risk Is Increased For Those with Wrong Ideas About Partner's Behavior

Young adults often have misconceptions about whether a new sexual partner has other partners, and those with such misconceptions may be at increased risk of being infected with a sexually transmitted disease (STD).<sup>1</sup> In a clinic-based sample of 18–30-year-olds in California, 74% of men and women whose partner had had another partner at some time during their relationship were not aware of this; the odds of being infected with trichomonas or chlamydia were 4.5 times as high in this group as among individuals who correctly believed that their partner had been monogamous. The odds of infection were similarly elevated among the 14% of men and women who incorrectly believed that their partner had had sex outside their relationship.

The sample consisted of 96 heterosexual couples attending STD and family planning clinics in San Diego in 2000–2001, who had begun a sexual relationship within the previous three months. In a one-hour computer-assisted interview, participants provided information about their demographic characteristics, sexual behavior (including whether they had had other partners since the beginning of the current relationship) and perception of whether their partner had had other partners during their relationship; members of each couple were interviewed simultaneously but separately. All participants were tested for chla-

mydia, gonorrhea and trichomonas infection.

Nearly half of the sample were white; the median age was 22, and the median number of years of education was 13. On average, both men and women had begun having intercourse at age 16, had had 4.3 partners during the previous year and had had 1.4 partners during the previous month. Men had had a lifetime average of 20.2 partners, and women had had 13.9; the difference, when adjusted for age, was not statistically significant. One-quarter of participants reported consistent condom use in the month before the interview, and three in 10 reported no use. None were infected with gonorrhea, but 12% tested positive for chlamydia or trichomonas.

Thirty-two percent of participants said that they had had another partner since beginning the current relationship; 16% believed that their partner had done so. Thirty-one percent were wrong about their partner: Seventy-four percent of those whose partner reported sexual activity outside their relationship believed that their partner had been monogamous, and 14% of those whose partner reported no concurrent partnerships thought that he or she had had sex outside their relationship.

Results of univariate analyses using chi-square and t-tests suggested that the likelihood of STD infection was not elevated among men and women who had had concurrent partners, but it was increased among the partners of such individuals. Furthermore, the odds appeared to be elevated for participants who were unaware that their partner had been non-monogamous and for those who said that the sexual relationship had begun within one week after the couple met. Other sexual risk factors, recent condom use and demographic characteristics (except residence in south San Diego) were not related to the likelihood of having an STD.

Each of three multivariate logistic regression models included a different measure of concurrent partnerships: whether the respondent had had sex outside the relationship, whether the respondent thought his or her partner had done so and the accuracy of the respondent's perception of his or her partner's behavior. The first model confirmed that individuals who had been nonmonogamous did not have an increased likelihood of being infected with chlamydia or trichomonas. The second showed that men and women whose partner had had another partner had significantly elevated odds of infection (odds ratio, 3.6). The third indicated that for those who incorrectly thought

either that their partner had been monogamous or that their partner had had a concurrent partner, the likelihood of infection was increased (4.5 and 4.7, respectively). In all three models, those who reported having begun the sexual relationship within a week after meeting their partner were at increased risk (6.6–9.1), as were residents of south San Diego (3.8–5.1); commitment to continuing the relationship was associated with an increased likelihood of infection in the second and third models.

The researchers conclude that although their study could be limited by reporting biases and the small sample, it demonstrates that young people's "poor ability to assess a partner's behavior is associated with increased risk" of STD infection. They note the need for larger studies, which should involve couples and be designed to permit detailed examination of condom use by motivations for concurrent partnerships or by which partner has had sex outside the relationship.—*D. Hollander*

#### REFERENCE

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## Subgroups of Homeless In San Francisco Have Different HIV Risk Factors

Members of San Francisco's indigent population have many sexual and other risk factors that put them at particularly high risk of HIV infection.<sup>1</sup> Among a sample of the city's homeless and marginally housed population, the overall HIV prevalence was 11%; for the subgroup of men who have sex with men, the prevalence was 30%. Sexual risk factors including being a man who has sex with men, having ever had syphilis, having ever traded sex for drugs or money, and having had receptive anal sex within the previous year were significantly associated with HIV infection among the overall sample (odds ratios, 1.6–4.6). Certain sexual risk factors were also significant among men who have sex with men and injection drug users.

To examine the prevalence of and risk factors associated with HIV infection among homeless and marginally housed adults in the San Francisco area, researchers interviewed a

sample of clients at overnight shelters, mid-day free-meal programs and low-cost residential hotels throughout the city and county. Between April 1996 and December 1997, participants answered questions about their social and demographic backgrounds; their sexual behavior and substance use histories; and their current, chronic and lifetime homelessness status. In addition, participants provided a blood sample for HIV testing. The final sample consisted of 2,508 individuals. The researchers used bivariable and logistic regression analyses to examine the independent associations between respondents' characteristics and HIV status for the overall sample and for three subgroups: men who have sex with men, injection drug users (excluding men who have sex with men) and those not included in either of the other subgroups (referred to as the residual subgroup).

Three-quarters of the sample were male, and six in 10 were nonwhite. The vast majority were aged 30 or older and had been living in the San Francisco area for a year or more; most were heterosexual and had at least a high school education. Twenty-four percent had ever been in prison, and 14% had had a blood transfusion between 1978 and 1985. Seventy-eight percent of the sample had been homeless as adults, 43% had been homeless the night before the survey and 48% had spent the previous night in a single-room occupancy hotel. The median monthly income was \$585.

A history of drug use was common among the sample; for example, 45% of respondents reported having ever injected drugs, and 63% had used crack. Current drug use was also common: Forty-four percent reported having used crack, other cocaine, heroin or stimulants within the last 30 days, and 35% reported having injected drugs during that time. Twenty-seven percent had ever shared a needle or syringe, 26% had ever taken part in a needle exchange program and 13% had ever used a shooting gallery.

Although less prevalent than drug-related risk factors, sexual risk factors were somewhat common among the homeless and marginally housed. Nineteen percent were men who have sex with men, 18% had had five or more sexual partners in the past year, 11% had had receptive anal sex in the past year and 9% had ever had syphilis. Nearly one-third had ever traded sex for money or drugs.

Overall, the prevalence of HIV infection among the sample was 11%. In bivariable analysis, HIV infection was significantly asso-

ciated with being male, white, 18–29, bisexual, a gay male and having lived in San Francisco for at least one year. In addition, HIV infection was associated with all sexual and drug use risk factors, except injection of cocaine. Of the three subgroups, men who have sex with men had the highest prevalence of HIV (30%); the prevalence of infection was 8% among injection drug users and 5% in the residual subgroup. The bivariable results suggest that each subgroup has different risk factors for HIV infection.

As in the bivariable analyses, the factors found to be significant in the multivariable analyses differed by group; however, for all groups, sexual risk factors seemed to be more important than other factors. In the overall sample, men who have sex with men were more likely than others to be infected with HIV (odds ratio, 4.6). Other factors associated with HIV infection included ever having had syphilis, being a white injection drug user, having had a blood transfusion, being nonwhite, having ever traded sex for money or drugs, and having had receptive anal sex in the last year (1.6–2.2). Among men who have sex with men, those who were white and traded sex were more likely than others to be infected with HIV (5.9); other significant risk factors for this subgroup were being nonwhite, having had receptive anal sex in the last year and ever hav-

ing had syphilis (2.0–3.4). Having ever had syphilis was also significantly associated with increased risk of HIV infection among the injection drug use group (3.3), along with having less than a 12th-grade education (2.6), ever having been in prison and having had a blood transfusion (2.1 for each). Finally, among the residual subgroup, HIV infection was associated with having had five or more sexual partners in the last year and being a female crack cocaine user who traded sex (2.9 and 6.1, respectively).

The researchers comment that the high HIV prevalence among the indigent of San Francisco, which is five times that of the general public, is “striking.” They conclude that although the homeless and marginally housed have “numerous complex problems such as extreme poverty, social marginalization and drug abuse,” sex is the most important factor in regard to HIV infection among this population. The researchers suggest that HIV intervention programs for men who have sex with men—the subgroup with the highest prevalence of infection—should “reinforce the focus on sexual risk.”—*J. Rosenberg*

#### REFERENCE

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databases. Analyses were adjusted for age.

During the study period, 15,823 women aged 15–49 died; 3% were pregnant or had been pregnant in the previous year. The pregnancy-associated death rate (37 per 100,000 pregnancies) was lower than the death rate among nonpregnant women (57 per 100,000 person-years). The difference corresponded to an almost 40% reduction in the risk of dying from any cause during pregnancy and the following year (relative risk, 0.6). Women’s risk of death from any cause was also reduced after a birth (0.5), but it was elevated after an induced abortion (1.5) and was essentially unchanged after a spontaneous abortion or ectopic pregnancy.

Overall, 18 deaths per 100,000 pregnancies, or slightly fewer than half of pregnancy-associated deaths, were attributable to natural causes; more than three-fourths of these deaths (14 per 100,000 pregnancies) were not related to pregnancy, either directly or indirectly. Like the overall mortality risk, the risk of death from natural causes was about 40% lower among women who were pregnant or had been pregnant in the past year than among nonpregnant women (relative risk, 0.6). More specifically, compared with their nonpregnant counterparts, pregnant and recently pregnant women had reduced risks of death from cancer (relative risk, 0.4) and diseases of the circulatory system (0.7), but risks varied with age. Women aged 25–34 and 35–49 had reduced risks of pregnancy-associated death due to cancer (0.3 for each) and natural causes overall (0.5 and 0.4), and women in the latter age-group also had a reduced risk of death from diseases of the circulatory system (0.3). However, women aged 15–24 had an increased risk of pregnancy-associated death due to diseases of the circulatory system (2.0), reflecting their elevated risk of death from cerebrovascular disease—primarily intracerebral hemorrhage and hemorrhagic stroke—after giving birth (4.1).

Improved care and monitoring during pregnancy and childbirth and after pregnancy could prevent many pregnancy-associated deaths from natural causes, the researchers contend; furthermore, prevention of pregnancy-associated deaths from injuries should not be neglected. “Because the majority of pregnancy-associated deaths were not related to pregnancy, it is important to focus also on [deaths] other than obstetric deaths,” they assert. Despite the sharp increase in the risk of death from cerebrovascular disease among pregnant and recently pregnant 15–24-year-

## For Finnish Women, Pregnancy-Associated Death Rate Is Lower Than Overall Rate, but Risks Vary by Age

Women who are pregnant or have been pregnant in the past year have a nearly 40% lower risk of dying from natural causes than their nonpregnant counterparts, according to a retrospective, population-based study in Finland.<sup>1</sup> Compared with nonpregnant women of the same age, pregnant and recently pregnant women aged 25–34 and 35–49 had reduced risks of death from cancer (relative risks, 0.3 for each), and those in the latter age-group had a reduced risk of death from diseases of the circulatory system (0.3). However, pregnant and recently pregnant women aged 15–24 had an increased risk of death from diseases of the circulatory system (2.0), which was due mainly to a sharply increased risk of death from cerebrovascular disease after giving birth (4.1). Of note, the majority of deaths from natural causes that occurred during pregnancy and the next year were not related to pregnancy.

To test the hypothesis of a “healthy pregnant woman effect,” which proposes that women have a reduced likelihood of dying from medical conditions while pregnant and in the following year, researchers compared the pregnancy-associated death rate (the rate of deaths during pregnancy and the year after its end) among 15–49-year-old women with the death rate among nonpregnant women of the same age. All deaths of women these ages during a 14-year period (1987–2000) in Finland were ascertained from a national death register; deaths were classified as those from natural causes (medical conditions) and those from violent causes (accidents and injuries). Information on births (both live births and stillbirths), induced abortions and the majority of ectopic pregnancies and spontaneous abortions in the study population was obtained by linking mortality data to three other national

olds, the absolute rate of this outcome is low, and its cause remains uncertain, the researchers note; targeting measures to prevent these pregnancy-associated deaths may therefore be difficult.—S. London

#### REFERENCE

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## Common-Law Unions Tied To Infant Death and Other Negative Birth Outcomes

Despite the growing prevalence and acceptability of common-law marriages in Quebec, women in this type of union continue to be at greater risk for negative birth outcomes than those in traditional marriages.<sup>1</sup> According to a study of births registered in the province in 1990–1997, infants born to women in cohabiting relationships are significantly more likely than those born to legally married women to be preterm, small for gestational age or low-birth-weight, or to die within 28–364 days. The odds of these outcomes are even higher among infants born to single women, particularly if the father's age and birthplace are not recorded on the birth registration form.

Data were drawn from birth registration files and linked vital records for 714,748 live births, including information on mothers' demographic characteristics and relationship status, and fathers' age and birthplace. Available data permitted the researchers to assess the prevalence of a number of birth outcomes, including preterm delivery (before 37 weeks' gestation), small size for gestational age (less than the 10th percentile, based on national standards for 1994–1996), low birth weight (less than 2,500 g), neonatal death (0–27 days) and postneonatal death (28–364 days). The researchers used chi-square tests to identify sig-

nificant differences among infants born to four groups of women: those who were legally married, those who were in cohabiting relationships, those who were single and provided any paternal information, and those who were single and provided no paternal information. Multilevel logistic regressions were constructed to examine associations between mothers' relationship status and various birth outcomes.

Throughout the study period, 53% of births were to women who were legally married, 35% were to women in common-law unions, 8% were to single mothers with paternal information and 4% were to single mothers with no paternal information. Between 1990 and 1997, the proportion of births to women in cohabiting relationships increased from 20% to 44%, whereas the proportion of births to legally married women decreased from 62% to 46%.

Overall, 36–59% of births were to women who had no other children, 1–22% were to teenagers and 10–43% were to women who had had less than 11 years of schooling. Proportions increased significantly across study groups, as mothers' relationship status went from legally married to cohabiting to single with paternal information to single with no paternal information. The proportion of infants born to native French speakers was significantly higher among children of women in common-law unions than among those of women in other groups (93% vs. 71–83%), as was the proportion of infants born to women who lived in communities of fewer than 10,000 people (25% vs. 19–20%).

Among the four study groups, 6–11% of infants were preterm, 9–17% were small for gestational age and 5–10% were low-birth-weight; the rate of neonatal death was 3–6 per 1,000 live births, and the rate of postneonatal death was 1–3 per 1,000 neonatal survivors. The likelihood of these outcomes increased significantly as mothers' relationship to fathers became less formal.

Results of the regression analysis, which

controlled for mothers' demographic characteristics and infants' gender, showed significant associations between marital status and a number of negative birth outcomes: Infants born to women in cohabiting partnerships were more likely than those with mothers in traditional marriages to be preterm (odds ratio, 1.1), small for gestational age (1.2) or low-birth-weight (1.2), or to die in the postneonatal period (1.2). These findings remained consistent when the researchers compared results for 1990–1993 with those for 1994–1997.

Relative to infants whose mothers were legally married, infants born to single mothers with paternal information had significantly elevated odds of preterm delivery (odds ratio, 1.3), small size for gestational age (1.3), low birth weight (1.5), neonatal death (1.3) or postneonatal death (1.4). Infants born to single mothers with no paternal information were significantly more likely than those born to legally married women to be preterm (1.4), small for gestational age (1.5) or low-birth-weight (1.6), or to die during the neonatal or postneonatal period (1.3 and 1.7).

The researchers acknowledge that their ability to explain the study findings is limited by the absence of information on a number of clinical and lifestyle factors, such as smoking and income level. They note that more research is needed to investigate the “causal mechanisms underlying the observed persistent disparities in pregnancy outcomes among common-law versus legally married mothers,” especially in light of the increasing popularity of common-law unions. These disparities, they suggest, “may well be related to differences among women who enter varying personal and cohabitation relationships, or to the quality of the relationships themselves, rather than to a beneficial effect of the legal act of marriage.”

—R. MacLean

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