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BACKGROUND INFORMATION ON THE

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Morbidity & Mortality Weekly Report: The Effectiveness of Condoms

UPDATE

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control
and Prevention (CDC)
Atlanta, Georgia 30333

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333

August 3, 1993

Dear Colleague:

On August 6, the Centers for Disease Control and Prevention (CDC) will be releasing a *Morbidity and Mortality Weekly Report* (*MMWR*) containing an article about condom effectiveness. This article is co-authored by CDC, the Food and Drug Administration (FDA), and the National Institutes of Health (NIH), and updates the 1988 *MMWR* article on the same subject.

There has been a great deal of media attention lately on the topic of condom effectiveness in preventing the transmission of HIV. For this reason, CDC is anticipating an increased level of interest in this particular *MMWR* article.

As advocates of public health, we have a responsibility to promote HIV prevention through factual disclosure of information using the best science available. The joint efforts of CDC, FDA, and NIH have provided compelling evidence that further substantiates our earlier findings and recommendations about condom effectiveness.

Enclosed is an information kit designed to update you about recent scientific findings on condom effectiveness. This material and information may help in your efforts to inform the public and prevent new sexually transmitted diseases and human immunodeficiency virus infections in your state and local communities.

A referral list is included in the information kit. If you need additional information or clarification, please do not hesitate to contact the CDC programs listed.

Sincerely yours,

James W. Curran, M.D., M.P.H.
Assistant Surgeon General
Associate Director for HIV/AIDS

Enclosure

CDC HIV/AIDS PREVENTION

CENTERS FOR DISEASE CONTROL AND PREVENTION

Facts about

Condoms and Their Use in Preventing HIV Infection and Other STDs

With more than 1 million Americans infected with HIV, most of them through sexual transmission, and an estimated 12 million other sexually transmitted diseases occuring each year in the United States, effective strategies for preventing these diseases are critical.

The proper and consistent use of latex condoms when engaging in sexual intercourse—vaginal, anal, or oral—can greatly reduce a person's risk of acquiring or transmitting STDs, including HIV infection. In fact, *recent studies provide compelling evidence that latex condoms are highly effective in protecting against HIV infection when used properly for every act of intercourse.*

Latex condoms are highly effective when used consistently and correctly—new studies provide additional evidence that condoms work

The protection that proper use of latex condoms provides against HIV transmission is most evident from studies of couples in which one member is infected with HIV and the other is not, i.e., "discordant couples." In a study of discordant couples in Europe, among 123 couples who reported *consistent* condom use, *none* of the uninfected partners became infected. In contrast, among the 122 couples who used condoms *inconsistently*, 12 of the uninfected partners became infected.

As these studies indicate, condoms must be used *consistently* and *correctly* to provide maximum protection. *Consistent use* means using a condom from start to finish with each act of intercourse. *Correct condom use* should include the following steps:

- Use a new condom for each act of intercourse.
- Put on the condom as soon as erection occurs and before any sexual contact (vaginal, anal, or oral).
- Hold the tip of the condom and unroll it onto the erect penis, leaving space at the tip of the condom, yet ensuring that no air is trapped in the condom's tip.
- Adequate lubrication is important, but use only water-based lubricants, such as glycerine or lubricating jellies (which can be purchased at any pharmacy). Oil-based lubricants, such as petroleum jelly, cold cream, hand lotion, or baby oil, can weaken the condom.
- Withdraw from the partner immediately after ejaculation, holding the condom firmly to keep it from slipping off.

Myths About Condoms

There continues to be misinformation and misunderstanding about condom effectiveness. The Centers for Disease Control and Prevention (CDC) provides the following updated information to address some common myths about condoms. This information is based on findings from recent epidemiologic, laboratory, and clinical studies.

▶ *Myth #1: Condoms don't work*

Some persons have expressed concern about studies that report failure rates among couples using condoms for pregnancy prevention. Analysis of these studies indicates that the large range of efficacy rates is related to incorrect or inconsistent use. The fact is: latex condoms are highly effective for pregnancy prevention, but only when they are used properly. Research indicates that only 30 to 60 percent of men who claim to use condoms for contraception actually use them for every act of intercourse. Further, even people who use condoms every time may not use them correctly. Incorrect use contributes to the possibility that the condom could leak from the base or break.

▶ *Myth #2: HIV can pass through condoms*

A commonly held misperception is that latex condoms contain "holes" that allow passage of HIV. Although this may be true for natural membrane condoms, laboratory studies show that intact latex condoms provide a continuous barrier to microorganisms, including HIV, as well as sperm.

▶ *Myth #3: Condoms frequently break*

Another area of concern expressed by some is about the quality of latex condoms. Condoms are classified as medical devices and are regulated by the FDA. Every latex condom manufactured in the United States is tested for defects before it is packaged. During the manufacturing process, condoms are double-dipped in latex and undergo stringent quality control procedures. Several studies clearly show that condom breakage rates in this country are less than 2 percent. Most of the breakage is due to incorrect usage rather than poor condom quality. Using oil-based lubricants can weaken latex, causing the condom to break. In addition, condoms can be weakened by exposure to heat or sunlight or by age, or they can be torn by teeth or fingernails.

Preventing HIV Infection and Other STDs

Recommended Prevention Strategies

Abstaining from sexual activity is the most effective HIV prevention strategy. However, for individuals who choose to be sexually active, the following are highly effective:

- Engaging in sexual activities that do not involve vaginal, anal, or oral intercourse
- Having intercourse only with one uninfected partner
- Using latex condoms correctly from start to finish with each act of intercourse

Other HIV Prevention Strategies

▶ *Condoms for Women*

The FDA recently approved a female condom, which will soon be available in the United States. A limited study of this condom as a contraceptive indicates a failure rate of about 26 percent in 1 year. Although laboratory studies indicate that the device serves as a mechanical barrier to viruses, further clinical research is necessary to determine its effectiveness in preventing transmission of HIV.

▶ *Spermicides*

The role of spermicides in preventing HIV infection is uncertain. Condoms lubricated with spermicides are not likely to be more effective than condoms used with other water-based lubricants. Spermicides added to the tip of the condom are also not likely to add protection against HIV.

Making Responsible Choices

In summary, sexually transmitted diseases, including HIV infection, are preventable, and individuals have several responsible prevention strategies to choose from. But the effectiveness of each one depends largely on the individual. Those who practice abstinence as a prevention strategy will find it effective only if they always abstain. Similarly, those who choose any of the other recommended prevention strategies, including condoms, will find them highly effective if used correctly and consistently.

For further information, contact:

CDC National AIDS Hotline: ***1-800-342-AIDS***
Spanish: ***1-800-344-7432***
Deaf: ***1-800-243-7889***

CDC National AIDS Clearinghouse
P.O. Box 6003
Rockville, MD 20849-6003

Commentary: Condoms and HIV/STD Prevention—Clarifying the Message

ABSTRACT

In the United States and throughout the world, the majority of human immunodeficiency virus (HIV) infections are sexually transmitted. An estimated 12 million other sexually transmitted diseases occur annually in the United States. Avoiding sexual intercourse altogether or restricting sex to partners known to be uninfected will prevent infection; this needs to be promoted as the most effective strategy. Studies show that correct and consistent use of latex condoms is highly effective in preventing sexually transmitted HIV infection and other sexually transmitted diseases. The effectiveness of condoms depends on individual behavior leading to correct and consistent use. Further studies are needed to maximize the use and effectiveness of condoms for those who choose to be sexually active as well as to develop and evaluate other methods, particularly those more under the control of women. In the interim, our prevention message should be clear: When used correctly and consistently, condoms are highly effective; when used otherwise, they are not. (*Am J Public Health.* 1993;83:501–503)

William L. Roper, MD, MPH, Herbert B. Peterson, MD, and James W. Curran, MD, MPH

More than 1 million Americans have been infected with the human immunodeficiency virus (HIV), and more than 250 000 have already been reported with acquired immunodeficiency syndrome (AIDS). In the United States and throughout the world, the majority of HIV infections are sexually transmitted. Furthermore, an estimated 12 million other sexually transmitted diseases occur each year in the United States, resulting in mortality and serious morbidity for many thousands of adults and children.

How can we reduce the sexual transmission of HIV and other diseases? Avoiding sexual intercourse altogether or restricting sex to partners known to be uninfected will prevent infection, and this needs to be widely and consistently promoted as the most effective strategy. However, many people at risk for HIV infection and other sexually transmitted diseases do not adopt these behaviors. Studies of sexually active persons show that correct and consistent use of latex condoms is highly effective in preventing HIV infection and other sexually transmitted diseases, including gonorrhea, chlamydia, genital ulcers, and herpes simplex virus infection.[1]

Two issues generally surface in the debate over advocating condom use in the prevention of HIV infection: One concerns the concepts of efficacy and effectiveness, the other the fear that making condoms available will encourage early sexual activity among adolescents and extramarital sex among adults. We deal with each argument in turn.

Condoms are not 100% efficacious and a high degree of individual compliance is required for condoms to be effective in use. Critics of the role of condoms in prevention cite worst-case-scenario estimates of condom efficacy and focus on results from studies that include persons who are inconsistent condom users. The problems associated with insisting on providing information only about perfectly effective prevention techniques have been recently reviewed.[2] Assertions that minimize the potential efficacy of condoms may be self-fulfilling prophecies, because condoms may be used less consistently by those who do not believe them to be effective. However, Fineberg has developed a mathematical model that predicts that consistent condom use could prevent nearly half of the sexually transmitted HIV infections in persons with one sexual partner and over half of HIV infections in persons with multiple partners.[3] Such a reduction could help interrupt the propagation of the epidemic. Therefore, promoting more widespread understanding of condoms' efficacy and advocating their consistent use by those who choose to be sexually active is crucial to protecting people from HIV infection and to slowing the spread of the HIV and sexually transmitted disease epidemics.

The effectiveness of consistent condom use is evident from recent epidemiologic studies of couples in which one partner has HIV infection. In three such prospective studies, consistent condom use provided a 70% to 100% reduction in the risk of transmitting HIV infection.[4–6] One of these studies[6] makes the critical distinction between the benefits of consistent and inconsistent condom use. In that study, from the European Study Group on Heterosexual Transmission of HIV, 563 couples from nine European Community countries were evaluated. Overall, 12% of the male partners and 20% of the female partners of HIV-infected persons became infected. However, among the 24 couples who consistently used condoms, none of the partners became infected. By contrast, among the 44 couples who reported inconsistent use of condoms, six female partners became infected. For condoms to provide a high degree of protection against HIV infection, they must be used correctly and consistently; inconsistent condom use provides an unacceptably low rate of protection.

The importance of compliance is illuminated by an analogy with pregnancy

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Editor's Note. See related editorial by Hein (p 492) in this issue.

prevention programs. Although typical pregnancy rates for couples who use condoms are as high as 10% to 15%,[7,8] rates are estimated to be as low as 2% for couples who use condoms correctly and consistently.[7] This discrepancy makes clear that any condom strategy must rely on the continuing behavior of the condom user. It is necessary, therefore, to integrate consistent condom use into our HIV prevention strategies.

Despite the widespread understanding that HIV infection is transmitted sexually, most sexually active Americans at risk for acquiring HIV infection have intercourse without using condoms. For example, in San Francisco, only 6% of heterosexual males with multiple sex partners reported always using condoms; a much higher proportion (48%) of gay and bisexual men reported always using condoms.[9] In another study, only about 20% of sexually active American women reported that their male partners used condoms.[10] But even among these couples, condom use was inconsistent; only one in five who reported condom use said that they were used at last intercourse.[10]

The factors that contribute to the low use of condoms and the ready acceptance of risk of HIV infection or other sexually transmitted diseases are complex and not completely understood. Among heterosexual men and women and gay and bisexual men in San Francisco,[9] sexual communication between partners and enjoyment of intercourse with condoms were the only statistically significant correlates of condom use. Although in that study Black and Hispanic women were less likely to report condom use by their partners than were White women,[9] national data suggest that there are no significant differences in reports of condom use by partners of Black women, non-Hispanic White women, and Hispanic women once social and demographic variables are accounted for.[10] This suggests that poverty and culture are important determinants of condom use.

After social and demographic factors are controlled for, women with multiple partners are less likely than those with one partner to report consistent condom use, perhaps because of the burden of negotiating condom use with many partners.[10] Also, decisions regarding condom use may be complicated by strategies for pregnancy prevention. In Philadelphia[11] and Baltimore,[12] women who had undergone surgical sterilization were less likely than nonsterilized women to report condom use. It is possible that if the woman is protected against pregnancy, the motivation of the woman or the man to use a condom may be reduced.

We turn now to the second issue often raised against advocacy of the condom. Many persons assert that those who promote condom use to prevent HIV infection appear to be condoning sexual intercourse outside of marriage among adolescents as well as among adults. Some information relevant to this possibility is now at hand. For example, recent data from Switzerland suggest that a public education campaign promoting condom use can be effective without increasing the proportion of adolescents who are sexually active.[13,14] From January 1987 to October 1991, self-reported consistent condom use among persons aged 17 to 30 years increased from 8% to 52% in association with the campaign.[13] By contrast, the proportion of adolescents (aged 16 to 19 years) who had sexual intercourse did not increase over that 3-year period.[14]

A clear message about condoms may in fact have been obscured by controversy over providing condoms for adolescents in schools while at the same time trying to discourage these same young people from initiating sexual activity. Sexual activity among adolescent women and men in the United States has increased steadily since the 1970s.[15–17] The AIDS epidemic has brought new dimensions of complexity and urgency to the debate over adolescent sexual activity. Some have urged abstinence as the only solution; others champion condom use as the most practical public health approach.

There must be a common ground. We should all be able to agree that premature initiation of sexual activity carries health risks. Therefore, we must exercise leadership in encouraging young people to postpone sexual activity. Adolescents are bombarded with messages encouraging them to "do it." We need to strive for a climate supportive of young people who are not having sex and so help to create a new health-oriented social norm for adolescents and teenagers about sexuality.

As we proceed toward this objective, we must be mindful that many will continue to engage in sexual activity. It is essential that these youngsters receive the message that they must practice safer sex and use condoms. The message that those who initiate or continue sexual activity must reduce their risk through correct and consistent condom use needs to be delivered as strongly and persuasively as the message "Don't do it." Protection of the individual and the public health will depend on our ability to effectively combine these messages.

Scientific studies are urgently needed to further understanding of how to maximize the use and effectiveness of condoms, to clarify the effectiveness of other barrier methods, and to develop and evaluate other preventive methods. In particular, studies should address the male, female, and couple determinants of consistent condom use, including the crucial role of peers and the need for a better understanding of economic and cultural variables. Because the male condom must be used by the man, a woman at risk must, in part, rely on her male partner(s) to protect her. Therefore, to enhance the ability of women to reduce their risks, further evaluation of mechanical and chemical barriers—including female condoms—is needed, as is the development of new methods over which women have greater control.[18–21] Finally, studies should evaluate how condom use is related to the use of other methods to prevent unintended pregnancy so as to address the overall reproductive health needs of both partners.

For adolescents and adults alike who have multiple sex partners, partners who engage in high-risk behaviors, or partners whose infection status is unknown, the risk of HIV infection or other sexually transmitted diseases can be dramatically reduced by correct and consistent condom use. Our prevention message should be clear on this point: When used correctly and consistently, condoms are highly effective; when used otherwise, they are not. □

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Man-To-Woman Sexual Transmission of HIV: Longitudinal Study of 343 Steady Partners of Infected Men

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Summary: To study incidence and risk factors of heterosexually transmitted HIV infection, we followed a cohort of 343 seronegative women, stable, monogamous partners of infected men whose only risk of acquiring HIV was sexual exposure to the infected partner. Nineteen seroconversions occurred in 529.6 person years (py) of observation, yielding an incidence rate of 3.6 per 100 py. The incidence rate was 7.2 per 100 py among women who did not always use or never used condoms and 1.1 among those who always used them [relative risk (RR) 6.6, 95% confidence interval (CI) 1.9–21.9]. Anal sex was associated with a risk increase in only those women not always using condoms (RR 1.4, 95% CI 0.4–4.8). No seroconversions were observed among 22 women using oral contraceptives. One of the women using intrauterine devices seroconverted. In couples who did not always use condoms, seroconversions occurred more frequently in partners of men with symptomatic diseases, with a low CD4+ cell number (<400 per mm^3) or with a detectable p24 antigen. In couples not always using condoms and where the man had a low CD4+ cell count, the joint presence of blood viral antigens and AIDS symptoms conditioned a fivefold increased risk of seroconversion of the woman (RR 5.4, CI 1.4–20.3). At multivariate analysis, women with longer relationships (≥1 year) showed a lower risk of seroconversion (RR 0.3, CI 0.1–0.8), and those partners of men positive for p24 antigen in serum had an increased risk of seroconversion (RR = 4.0, CI 0.1–0.8). **Key Words:** Heterosexually transmitted HIV—Seroconversion—Risk factors.

Several cross-sectional studies on heterosexual HIV transmission have been conducted on steady partners of infected men (1–11) and on prostitutes or women with multiple partners (12–18). These surveys consistently showed a protective role of condom use (9,11–15) and a risk associated with anal sex (11,19), but they also reported different prevalence rates (15–50%) and inconsistencies in other potential risk factors. Most studies failed to show any relationship between infection and duration or frequency of sexual exposure (9,11,20). It

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remained unclear whether sexually transmitted diseases (STDs) or genital infections, signs of HIV infection or factors that enhance the transmission of the virus, are indicators of high-risk sexual behavior (11,16,21,22). Different results were reported on the infectiousness of the infected partner, since only few studies found a direct relationship between stage of HIV disease and risk of transmission (3,23).

In cross-sectional studies it is generally impossible to quantify the duration of exposure of the unaffected partner. In fact, the duration of infectivity of the index case is generally unknown, and the date of transmission from the index case to his/her partner cannot be retrospectively assessed. The risk of transmission and the role of potential cofactors can be better detected by longitudinal studies on stable, monogamous couples discordant for HIV. In these couples the duration of exposure is a controlled factor, and the possibility of biases related to the presence of multiple partners is lessened. However, these couples are expected to have a low rate of seroconversion because of personal and media counseling (24), and a large group must be followed up to provide reliable estimates.

We have previously reported the results of a cross-sectional study of 364 women whose only exposure to HIV was sexual intercourse with an HIV-infected man (25). We have continued to follow those couples who were discordant for HIV infection to determine the incidence and risk factors for man-to-woman sexual transmission.

METHODS

The couples were recruited in 16 participating centers: eight hospital departments of infectious diseases, five intravenous drug user outpatient clinics, and three centers for HIV surveillance. All of the HIV-infected subjects attending the centers (who were or had previously been intravenous drug users or recipients of blood or blood derivatives as well as men reporting homosexual contacts) were asked about their steady heterosexual partners. Each partner who was not already known to be HIV-infected was invited for an interview and screening tests. The presence of serum antibodies against HIV was assessed by immunoenzymatic methods using commercially available kits. Positive sera were tested again with a second immunoenzymatic test and confirmed by Western blot. Seroconversion was defined as the development of a positive ELISA test and Western blot according to international criteria. Information on intravenous drug use, sexual intercourse with other subjects at risk, blood transfusions or blood-derivative therapies, and prostitution was collected in order to exclude subjects with risk factors other than sexual exposure to their infected partner.

Between February 1, 1987, and May 30, 1991, 368 women seronegative at the first visit were asked to return to the center at least every 6 months for interview and to repeat the HIV antibody test. Of these women, 343 (98.2%) came for at least one follow-up visit and were included in this study.

At each visit a structured interview was administered to the woman by the attending physician. The questionnaire elicited information about history of STDs, frequency and type of sexual intercourse, and contraceptive methods used since the last follow-up visit. The last available questionnaire and the man's concurrent status were used for the analysis.

Ethical Considerations

Men and women were separately advised on risk and prevention of sexual HIV transmission by the same physician. The use of condoms was strongly and repeatedly recommended. Since the results of the cross-sectional study suggested an increased risk of HIV infection for women using intrauterine devices (IUDs), it was suggested that they have the device removed.

Analysis

Incidence of seroconversion was evaluated by the person-year method, and seroconversion rates were derived (26). The time of seroconversion was conventionally considered as the midpoint between the first seropositive and the last seronegative test. Relative risks (RR) were estimated as incidence rate ratios, and confidence intervals (CI) of the relative risks were calculated with Wolff's method (27,28).

For the study of risk factors, frequency of intercourse was divided into two categories: twice a week or less and more than twice a week. The type of sexual intercourse was dichotomized as ever or never anal. Condom use was grouped into three frequency categories: always, not always, and never. A history of STDs was never reported. The only reported genital disease was vaginitis (diagnosed by a physician or described as vaginal discharges). The last available information on the infected partner ($CD4^+$ cell count, disease stage, p24 antigen serum positivity) was collected from the standard medical records used by all centers. Men were classified according to disease stage into symptomatic (CDC group IV) and asymptomatic (CDC groups II and III).

Condom use prevents the contact of infected semen with genital mucosa and is expected to act as an effective modifier of other risk factors. For this reason two analyses were carried out, separately for woman always using seropositives (consistent use) and not always or never using condoms (not consistent use).

A multivariate analysis using Cox's proportional hazard model was carried out, including all the variables considered as potential risk factors for transmission, to estimate the independent contribution of each variable to the risk of infection.

RESULTS

The general and clinical characteristics of the 343 couples included in the study are shown in Table 1. The couples had a mean duration of their relationship of ~4 years, and the women were mainly between 20 and 30 years old (Table 1). Most men acquired the infection through intravenous drug use

TABLE 1. *General and clinical characteristics of the women and of the infected men*

Mean duration (months) of the relationship at enrollment (range)	44.3 (1–134)
Mean age (years) of the women (range)	25.5 (15–51)
Mean $CD4^+$ cell number per mm^3 of the men (range)	134 (10–1,346)
Men with AIDS	47 (13.7%)
Men treated with zidovudine	92 (26.8%)
Man's method of infection	
intravenous drug use	270 (78.7%)
other	73 (21.3%)
Mean follow-up time (months) to seroconversion of the women (range)	14.1 (2–36)

(78.7%). Forty-seven men (13.7%) had a symptomatic infection, four became symptomatic during follow-up, 92 (26.8%) were treated with zidovudine. Nineteen women seroconverted after a mean time from inclusion of 14.1 months. The first seroconversion was observed 2 months after inclusion and the last one after 3 years.

Risk of Seroconversion and Condom Use

The 343 women who had at least one follow-up visit made up a total of 529.6 person years (py) of observation. The median follow-up was 24 months (range 1–55). The incidence rate based on the 19 observed seroconversions was 3.6 per 100 py. Thirty-eight women, followed for a total of 41.7 py altogether suspended sexual intercourse with their infected partners at or just before the time of enrollment: no seroconversions occurred in this group, which was excluded from further analyses. Among the remaining 305 women, the yearly seroconversion rate was 3.9%.

Three seroconversions were noted among couples always using condoms (Table 2), and most seroconversions (16/19, 84%) occurred in couples never or not always using this device. The risk of infection was increased sixfold among women with nonconsistent use of condoms (never or not always) (RR 6.4, CI 1.9–21.9).

TABLE 2. *Incidence rates (IR) and relative risks (RR) of seroconversion by condom use*

Condom use	N	py[b]	HIV^+	IR	RR (95% CI)[a]
Never	79	139.3	8	5.7	1
Not always	55	82.5	8	9.7	1.7 (0.6–4.5)
Always	171	266.0	3	1.1	0.2 (0.1–0.7)

[a] 95% confidence interval.
[b] Person years at risk of acquiring the infection.

Relationship Length, Sexual Behavior, and Vaginitis

Women who had, at the time of inclusion, been in their relationships ≤1 year had a higher incidence of seroconversion when compared with women with longer relationships (Table 3). This finding was observed in both groups of condom use. In the group with nonconsistent condom use, a small and not statistically significant risk increase was seen for higher frequencies of sexual intercourse and for a history of vaginitis. In the same group, anal sex was associated with a 40% risk increase that did not reach statistical significance.

Twenty-two women used oral contraceptives (11 in association with condoms), and none of them seroconverted. Despite counseling two women continued to use intrauterine devices, and the one who did not use condoms seroconverted.

Man's Disease Stage, $CD4^+$ Cell Count, and p24 Antigen Positivity

Women in the group of nonconsistent condom use had incidence rates about three times higher when exposed to symptomatic partners or those with low $CD4^+$ cell count (Table 4). A detectable p24 antigen in the man was associated with increased risks both in condom users and nonusers.

Analysis of Couples with Inconsistent Use of Condoms and Where the Man Has a Low $CD4^+$ Cell Number

Since a low $CD4^+$ cell number and the presence of detectable HIV-1 antigens in blood are frequently associated with advanced stages of disease, we focused the analysis on 87 couples with nonconsistent use of condoms and where the infected man had a $CD4^+$ cell count <400. As shown in Table 4, this subgroup was 28.5% of the entire population but contributed to 14 of 19 (73.7%) of the observed seroconversions (incidence rate 9.3 per 100 py). Taking partners of men asymptomatic and negative to HIV antigen (incidence rate 4.7 per 100 py) as the reference category, the incidence was about three times higher among partners of symptomatic or antigen-positive men (12.4 and 13.3, respectively, per 100 py). The joint presence of the antigen and of symptoms of AIDS had an additive effect on the incidence rate of seroconversion of the woman (25.2 per 100 py).

TABLE 3. *Incidence rates (IR) and relative risks (RR) of seroconversion by relationship duration, sexual behavior, history of vaginitis, and oral contraceptive use*

Variables	Condom use									
	Not always–never					Always				
	N	py[a]	HIV$^+$	IR	RR (95% CI)[b]	N	py[a]	HIV$^+$	IR	RR (95% CI)[b]
Relationship length										
≤1 yr	33	39.2	4	10.2	1	26	40.5	3	7.4	1
>1 yr	101	181.8	12	6.6	0.7 (0.2–2.0)	145	225.4	0	0	0
Frequency of intercourse										
<2 weeks	74	129.3	9	6.7	1	100	159.4	1	0.6	1
>2 weeks	60	92.6	7	7.6	1.1 (0.4–2.9)	71	106.6	2	1.9	3.0 (0.3–32.9)
Anal intercourse										
No	113	189.8	13	6.9	1	159	246.1	3	1.2	1
Yes	21	32.1	3	9.3	1.4 (0.4–4.8)	12	20.0	0	0	0
Vaginitis										
No	123	200.2	14	7.0	1	162	246.5	3	1.2	1
Yes	11	21.6	2	9.2	1.3 (0.3–5.8)	9	19.6	0	0	0
Oral contraceptive use										
No	123	203.7	16	7.9	1	160	251.0	3	1.2	1
Yes	11	18.1	0	0	0	11	15.0	0	0	0

[a] Person years at risk of acquiring the infection.
[b] 95% confidence interval.

Multivariate Analysis

The use of condoms during all sexual intercourse was associated with a 90% risk reduction. Women with relationships lasting >1 year had a 70% statistically significant risk reduction. A low and nonsignificant risk increase was found for women reporting intercourse two or more times weekly and for those practicing anal sex. Among the indicators of a partner's infectiousness, the increased risk of infection in female partners of men positive for HIV p24 was higher than in univariate analysis (RR 4.0, CI 1.2–13.3). A borderline statistically significant risk increase remained for female partners of symptomatic men.

DISCUSSION

The results of this study confirm in a prospective setting the protective effect of condom use. The annual seroconversion rate was 5.7% and 9.7%, respectively, in couples never or not always using condoms and was reduced to 1.1% in those who always used this device. Inconsistent use of condoms, in this study, had no effect on the risk of acquiring the infection, since no significant difference was noted between those never or not always using condoms.

Condom use reduced so dramatically the number of seroconversions that the role of many reported risk factors was not recognizable in the group of

TABLE 4. *Incidence rates (IR) and relative risks (RR) of seroconversion by characteristics of the infected man*

Variables	Condom use									
	Not always–never					Always				
	N	py[a]	HIV$^+$	IR	RR (95% CI)[b]	N	py[a]	HIV$^+$	IR	RR (95% CI)[b]
Disease stage										
Asymptomatic	97	160.7	7	4.4	1	122	190.9	2	1.1	1
Symptomatic	37	61.1	9	14.7	3.4 (1.3–9.1)	39	75.2	1	1.3	1.2 (0.1–14.0)
Viral p24 antigen										
Negative	117	200.9	12	6.0	1	147	233.3	2	0.9	1
Positive	17	30.0	4	13.3	2.2 (0.7–6.9)	24	32.4	1	3.1	3.4 (0.4–40.0)
CD4$^+$ per mm^3										
>400	47	72.1	2	2.7	1	77	120.6	3	2.5	1
≤400	87	149.8	14	9.4	3.4 (0.8–14.8)	94	145.5	0	0	0

[a] Person years at risk of acquiring the infection.
[b] 95% confidence interval.

TABLE 5. *Incidence rates (IR) and relative risks (RR) of seroconversion of female sexual partners of men with CD4⁺ counts <400 per mm³ not using condoms*

Characteristics	N	py[a]	HIV⁺	IR	RR (95% CI)[b]
Asymptomatic, p24 antigen negative	47	84.6	4	4.7	1
Symptomatic, p24 antigen negative	6	8.1	1	12.4	2.6 (0.3–23.3)
Asymptomatic, p24 antigen positive	25	45.2	6	13.3	2.8 (0.8–10.0)
Symptomatic, p24 antigen positive	9	11.9	3	25.2	5.4 (1.2–23.8)

[a] Person years at risk of acquiring the infection.
[b] 95% confidence interval.

women who always used them. In couples with inconsistent use of condoms we have found a high infectiousness of partners with symptomatic disease or those positive to p24 antigen. Furthermore, when the man had a CD4⁺ cell count <400 cells per mm³, the concurrent presence of symptoms of disease and of p24 antigen in serum carried an additive effect on incidence. Based on the incidence estimates of this study, one-quarter of the women not using condoms who are partners of symptomatic men positive to p24 antigen and with a CD4⁺ cell count of ≤400 are expected to seroconvert in 1 year of sexual exposure. This result suggests that counseling must be an ongoing process. In fact, the reduction of CD4⁺ cells, symptoms of AIDS, and p24 antigenemia are signs of disease progression, and over time all infected subjects are expected to increase their infectiousness in parallel with the evolution of the disease.

Women seronegative at the time of inclusion after long-standing relationships (>1 year) with an infected man had 70% less risk of seroconversion. Some women might carry latent infections that do not express antibodies (29); in this case, an imbalance in their number between the two groups with shorter and longer relationships could explain the difference in the risk observed in this study. However, asymptomatic carriers have been described to be rare, and even their existence has been questioned (30–32). On the other hand, women still seronegative after long-standing relationships with infected men might represent a subpopulation with less susceptibility to infection. A lower susceptibility might be due to genetic factors, which have been hypothesized on the basis of variations in CD4⁺ receptor molecules on the surface of T cells (33). Molecular variations in HIV might influence its capacity to infect a new host (34), and women remaining seronegative after long-term relationships might be partners of men carrying viral strains with less of a sexual infectivity.

The practice of anal sex was associated with a risk increase only in women reporting that they never or rarely used condoms during sexual intercourse. This result confirms that this practice has to be discouraged in partners of seropositive men. However, it also suggests that the effect of high-risk practices can be lessened or completely prevented by the use of condoms.

Small and nonsignificant risk increases were observed among women reporting a higher frequency of sexual intercourse. This result does not agree with what we observed in the cross-sectional part of the study, where women reporting sexual intercourse more than two times weekly had a twofold risk increase (25). A lack of consistency of the risk of transmission per each single sexual act with an infected person (35,36) has been noted in other studies. The lack of association between seroconversion and frequency of intercourse in this study might stem from the small number of seroconversions, which prevents reliable estimates when the investigated variable is not strongly associated with the risk of seroconversion.

The results on oral contraceptives and IUDs, although somewhat anecdotal, agree with our previ-

TABLE 6. *Relative risks (RR) of seroconversion estimated by multivariate analysis (Cox's proportional hazard model)*

Variables	RR (95% CI)[a]
Relationship length	
≤1 year	1
>1 year	0.3 (0.1–0.8)
Condom use	
Not always–never	1
Always	0.1 (0.0–0.5)
Frequency of intercourse	
<2 weeks	1
≤2 weeks	1.3 (0.5–3.7)
Anal intercourse	
No	1
Yes	1.1 (0.3–4.4)
Vaginitis	
No	1
Yes	0.8 (0.2–3.57)
Partner's disease	
Asymptomatic	1
Symptomatic	2.6 (0.9–7.1)
Partner's p24 antigen	
Negative	
Positive	4.0 (1.2–13.3)
Partner's CD4⁺ count	
≥400	1
<400	1.2 (0.4–4.0)

[a] 95% confidence interval.

ous findings in the cross-sectional part of the study (25,37). No seroconversion was observed among the 22 women using oral contraceptives, whereas one of the two women who used IUDs seroconverted. As condoms are not completely successful in preventing unwanted pregnancies, it is advisable to use oral contraceptives and not IUDs in association with condoms when maximal contraceptive efficacy is required in women sexually exposed to HIV.

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From the Surgeon General, US Public Health Service

Condom Use for Prevention of Sexual Transmission of HIV Infection: In 1989, a Public Health Service committee including representatives from the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and the Food and Drug Administration (FDA) reviewed with the Surgeon General the scientific data based on which condoms were recommended as part of a national strategy to prevent transmission of the human immunodeficiency virus (HIV). Although the committee concluded that only sexual abstinence or mutual monogamy between uninfected partners completely eliminate the risk of sexual transmission of HIV, it also concluded that latex condoms are highly effective barriers and should be used consistently by all persons who have multiple partners or have a primary partner who is infected or whose serostatus is unknown.

Recently, members of the committee met again with the Surgeon General to review data from the epidemic, new studies on condom efficacy, and statistical studies projecting the impact of condom use on the epidemic. The following updated data support the 1989 recommendation and indicate that proper use of latex condoms provides a high degree of protection against the sexual transmission of HIV.

Status of the Epidemic

Infection with HIV continues to increase in the United States and heterosexual transmission plays an increasingly important role. The proportion of cases of the acquired immunodeficiency syndrome (AIDS) attributable to heterosexual transmission increased by 21% during 1991, making heterosexual transmission the category with the largest percentage increase in AIDS cases from 1990 through 1991.

In Vitro Studies of Latex Condoms

One NIH study that evaluated latex condoms using scanning electronic microscopy found no holes even on magnification at ×2000. Although the inability of this investigation to identify holes in latex condoms is reassuring, microscopic holes in latex condoms can occur. The FDA conducts periodic testing of condom lots using the water-leak test, which can identify holes as small as 10 μm. Recent FDA data indicate that the average batch of condoms has a water-leak rate of 0.3%.

Fortunately, there are obstacles to the passage of HIV through a microscopic hole. A free virus, which is nonmotile, would pass through a hole only if it were associated with a cell that moves or if it were moved by hydrostatic pressure through the hole. Monocytes and lymphocytes that may carry HIV are 10 to 15 μm in diameter, too large to pass through the microscopic holes detected by routine testing. An FDA study simulated free HIV in fluid under pressure and found that most condoms leaked no fluid at all, and that even the worst-performing condom reduced estimated viral exposure by 10 000-fold. This evaluation was reassuring, especially since several extreme assumptions were made; for example, the titer of HIV-sized particles used was 100 million times the titer of HIV in semen.

Epidemiologic and Statistical Studies

Although laboratory data now demonstrate the barrier effectiveness to HIV of condoms, one must go beyond the laboratory to look at effectiveness during actual use. Studies of people who use condoms for contraception report failure rates ranging from less than one per 100 to 16 per 100 users per year. The importance of proper condom use is evident from a recent report of Great Britain's Oxford Family Planning Cohort study, in which condom-user failure rates for pregnancy among married, more experienced users were predicted to be as low as six per 1000 users per year.

Since 1989, both statistical modeling and prospective observational studies have provided evidence that the relative risk of HIV infection among condom users is equivalent to that for pregnancy, but that the absolute risk of acquiring HIV infection from condom failure is lower than the comparable risk for pregnancy. The results of two recent observational studies from the highest-risk group (discordant couples, in which one partner is HIV-seropositive and one is not) have now demonstrated a relative risk reduction for HIV of 80% or better. Based on an underlying seroconversion rate of 20 in 100 discordant couples and an 80% risk reduction, four seroconversions in 100 discordant couples using condoms are expected per year.

Consistent with this projection, a recently published prospective study from Zaire identified an annualized condom-user HIV failure rate of 3.1 in 100 in discordant couples. Other studies in discordant couples have shown no seroconversions among consistent condom users, and condom-user HIV failure rates for the general population have been projected to be two to four seroconversions per 100 000 condom users. Not only are the failure rates for condom users low but, independent of the level of HIV in the general population, 20%, 40%, or 80% of all new HIV seroconversions in the United States will be avoided if 25%, 50%, or 100%, respectively, of persons use condoms consistently and correctly.

New Behavioral Studies

Because proper condom use is key to preventing the sexual transmission of HIV, it is imperative to better understand the determinants of correct condom use. Some studies are under way and more are planned. One early finding is that motivation plays a key role. It is unreasonable to expect that people at risk will be highly motivated to systematically use condoms unless they believe that condoms will be highly effective if they do so. We have a responsibility to let them know that a compelling case now exists for condom effectiveness—if condoms are used consistently and correctly.

Conclusion

Our message must be clear and simple. First, the only sure way to avoid the risk of sexual exposure to HIV is to have sex in a monogamous relationship with an uninfected partner or to abstain. Insertive sex with an infected partner or one of unknown serostatus is unsafe. If one engages in these unsafe practices, a latex condom should be used every time from start to finish. Doing so is a highly effective way to reduce the risk of sexual exposure to HIV. Instructions for proper condom use are contained in the FDA brochure *Condoms and Sexually Transmitted Diseases... Especially AIDS*, which is available through the National AIDS Hotline, (800) 342-AIDS.

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ABSTRACT

HETEROSEXUAL TRANSMISSION OF HIV IN EUROPEAN COHORT OF COUPLES

De Vincenzi Isabelle for the European Communities Study Group on heterosexual transmission of HIV. European Centre for the Epidemiological Monitoring of AIDS.
Paris, France.

Objective: To determine risk factors and rates of HIV transmission in serologically discordant couples receiving regular safe-sex counselling.

Methods: From 1987 to 1991, 563 couples were recruited from 9 countries in a cross-sectional study. 378 HIV(-) partners recruited in settings where follow-up was achievable were included in the prospective study. At each interview, partners were tested, interviewed and counselled. Only partners presenting no risk factors for HIV infection other than sexual contacts with the index (HIV(+) partner) were included.

Results: The follow-up rate was 80.4% (304/378). 128 couples (42%) stopped sexual contacts (less than 3 months after inclusion for 59). Mostly because of death or severe disease of the index. 245 couples still having sexual contacts 3 months after inclusion were followed for a median of 22 months. 123 (50.2%) couples used condoms for each episode of vaginal or anal intercourse. No seroconversions occured among these 123 partners (95% CI: 0-1.5/100 person-years). 12 seroconversions occured among the remaining 122 partners (seroconversion rate = 5/100 person-years (95% CI: 2.6-8.8), or 1.2 per 1000 unprotected contacts (95% CI: 0.6-2.1). Cumulative rates of seroconversion at 24 months (SR) were compared using Kaplan-Meier survival analysis. Among irregular condoms users, SR were similar whatever the frequency of condom use, and the sex of the partner (12.5% for females versus 11.0% for males). For partners of symptomatic (or with T4<200/mm3) index cases. SR was 36.7%, compared to 8.5% for partners of asymptomatic index cases with T4>200/mm3 ($p<0.01$). SR were different ($p=0.05$) between partners reporting 1) no STD(9.5%). 2) non-ulcerative STD (25.0%), and 3) ulcerative STD (40.0%) The SR for female partners were different ($p=0.02$) according to the frequency of sperm ejaculation by male index cases: no ejaculation (0%), ejaculation for about half of sexual contacts (6.7%) and nearly always ejaculation (29.7%).

Conclusion: 1. No seroconversion occured in regular condom users. 2. The observed transmission rate of 1.2/1000 unprotected contacts should be interpreted with caution since it may greatly vary according to the presence or absence of risk factors: Advanced stage of infection for the index and partner's STD were found to increase the risk, whilst avoidance of sperm ejaculation showed some protective effect.

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MORBIDITY AND MORTALITY WEEKLY REPORT

Update: Barrier Protection Against HIV Infection and Other Sexually Transmitted Diseases

Although refraining from intercourse with infected partners remains the most effective strategy for preventing human immunodeficiency virus (HIV) infection and other sexually transmitted diseases (STDs), the Public Health Service also has recommended condom use as part of its strategy. Since CDC summarized the effectiveness of condom use in preventing HIV infection and other STDs in 1988 (*1*), additional information has become available, and the Food and Drug Administration has approved a polyurethane "female condom." This report updates laboratory and epidemiologic information regarding the effectiveness of condoms in preventing HIV infection and other STDs and the role of spermicides used adjunctively with condoms.*

Two reviews summarizing the use of latex condoms among serodiscordant heterosexual couples (i.e., in which one partner is HIV positive and the other HIV negative) indicated that using latex condoms substantially reduces the risk for HIV transmission (*2,3*). In addition, two subsequent studies of serodiscordant couples confirmed this finding and emphasized the importance of consistent (i.e., use of a condom with each act of intercourse) and correct condom use (*4,5*). In one study of serodiscordant couples, none of 123 partners who used condoms consistently seroconverted; in comparison, 12 (10%) of 122 seronegative partners who used condoms inconsistently became infected (*4*). In another study of serodiscordant couples (with seronegative female partners of HIV-infected men), three (2%) of 171 consistent condom users seroconverted, compared with eight (15%) of 55 inconsistent condom users. When person-years at risk were considered, the rate for HIV transmission among couples reporting consistent condom use was 1.1 per 100 person-years of observation, compared with 9.7 among inconsistent users (*5*).

Condom use reduces the risk for gonorrhea, herpes simplex virus (HSV) infection, genital ulcers, and pelvic inflammatory disease (*2*). In addition, intact latex condoms provide a continuous mechanical barrier to HIV, HSV, hepatitis B virus (HBV), *Chlamydia trachomatis*, and *Neisseria gonorrhoeae* (*2*). A recent laboratory study (*6*) indicated that latex condoms are an effective mechanical barrier to fluid containing HIV-sized particles.

Three prospective studies in developed countries indicated that condoms are unlikely to break or slip during proper use. Reported breakage rates in the studies were 2% or less for vaginal or anal intercourse (*2*). One study reported complete slippage

*Single copies of this report will be available free until August 6, 1994, from the CDC National AIDS Clearinghouse, P.O. Box 6003, Rockville, MD 20849-6003; telephone (800) 458-5231.

Barrier Protection — Continued

off the penis during intercourse for one (0.4%) of 237 condoms and complete slippage off the penis during withdrawal for one (0.4%) of 237 condoms (*7*).

Laboratory studies indicate that the female condom (Reality™ †)—a lubricated polyurethane sheath with a ring on each end that is inserted into the vagina—is an effective mechanical barrier to viruses, including HIV. No clinical studies have been completed to define protection from HIV infection or other STDs. However, an evaluation of the female condom's effectiveness in pregnancy prevention was conducted during a 6-month period for 147 women in the United States. The estimated 12-month failure rate for pregnancy prevention among the 147 women was 26%. Of the 86 women who used this condom consistently and correctly, the estimated 12-month failure rate was 11%.

Laboratory studies indicate that nonoxynol-9, a nonionic surfactant used as a spermicide, inactivates HIV and other sexually transmitted pathogens. In a cohort study among women, vaginal use of nonoxynol-9 without condoms reduced risk for gonorrhea by 89%; in another cohort study among women, vaginal use of nonoxynol-9 without condoms reduced risk for gonorrhea by 24% and chlamydial infection by 22% (*2*). No reports indicate that nonoxynol-9 used alone without condoms is effective for preventing sexual transmission of HIV. Furthermore, one randomized controlled trial among prostitutes in Kenya found no protection against HIV infection with use of a vaginal sponge containing a high dose of nonoxynol-9 (*2*). No studies have shown that nonoxynol-9 used with a condom increases the protection provided by condom use alone against HIV infection.

Reported by: Food and Drug Administration. Center for Population Research, National Institute of Child Health and Human Development, National Institutes of Health. Office of the Associate Director for HIV/AIDS; Div of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion; Div of Sexually Transmitted Diseases and HIV Prevention, National Center for Prevention Svcs; Div of HIV/AIDS, National Center for Infectious Diseases, CDC.

Editorial Note: This report indicates that latex condoms are highly effective for preventing HIV infection and other STDs when used consistently and correctly. Condom availability is essential in assuring consistent use. Men and women relying on condoms for prevention of HIV infection or other STDs should carry condoms or have them readily available.

Correct use of a latex condom requires 1) using a new condom with each act of intercourse; 2) carefully handling the condom to avoid damaging it with fingernails, teeth, or other sharp objects; 3) putting on the condom after the penis is erect and before any genital contact with the partner; 4) ensuring no air is trapped in the tip of the condom; 5) ensuring adequate lubrication during intercourse, possibly requiring use of exogenous lubricants; 6) using only water-based lubricants (e.g., K-Y jelly™ or glycerine) with latex condoms (oil-based lubricants [e.g., petroleum jelly, shortening, mineral oil, massage oils, body lotions, or cooking oil] that can weaken latex should never be used); and 7) holding the condom firmly against the base of the penis during withdrawal and withdrawing while the penis is still erect to prevent slippage.

Condoms should be stored in a cool, dry place out of direct sunlight and should not be used after the expiration date. Condoms in damaged packages or condoms that show obvious signs of deterioration (e.g., brittleness, stickiness, or discoloration) should not be used regardless of their expiration date.

†Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Vancomycin-Resistant Enterococci — Continued

The observed differences in mortality for patients with vancomycin-resistant compared with vancomycin-susceptible nosocomial enterococcal bloodstream infections may be explained in part by differences in these risk factors.

Enterococci may also serve as a reservoir for resistance genes for other gram-positive organisms, including *Staphylococcus aureus*. Laboratory evidence suggests that transfer of the *vanA* gene from enterococci to *S. aureus* can occur and generate a vancomycin-resistant *S. aureus* (*3*). However, clinical strains of *S. aureus* that are vancomycin resistant have not been reported to CDC. Vancomycin resistance in coagulase-negative staphylococci has been reported rarely (*4*); none has been reported through the NNIS system.

Detection of vancomycin resistance using in vitro susceptibility testing methods remains difficult (*5*). In particular, isolates with the VanB phenotype often are not detected with automated methods. The NNIS data may represent both underreporting of resistance and a bias in favor of detecting only the VanA phenotype. The National Committee for Clinical Laboratory Standards has approved changes in the disk diffusion testing methodology to increase the accuracy of this test (*6*) and is assessing a vancomycin resistance agar screen test using 6 µg/mL of vancomycin in brain-heart infusion agar. These changes should enhance the ability of microbiology laboratories to detect resistant enterococci.

Control measures for vancomycin-resistant enterococci include more consistent application of infection-control precautions and control of indiscriminate vancomycin use (*7,8*). Vancomycin use is a risk factor for colonization with vancomycin-resistant enterococci (*9*); however, the transmission of the resistant organism can be controlled and eradicated in a hospital by intensive infection-control efforts.

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Vancomycin-Resistant Enterococci— Continued

384 nosocomial enterococci at hospitals with fewer than 200 beds, 105 (1.8%) of 5780 nosocomial enterococci at hospitals with 200–500 beds, and 173 (3.6%) of 4797 at hospitals with more than 500 beds. Vancomycin resistance did not vary substantially by method of susceptibility testing.

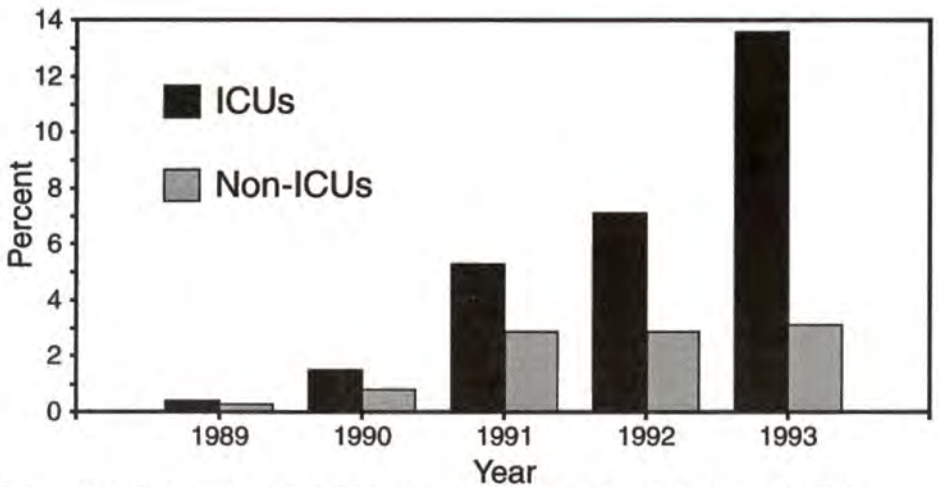
Since 1989, of 32 vancomycin-resistant nosocomial enterococci isolates from the NNIS system examined at CDC for confirmation of resistance, 20 demonstrated high-level vancomycin and teicoplanin resistance (the VanA phenotype) where the minimum inhibitory concentration (MIC) was >128 µg/mL for vancomycin and >8 µg/mL for teicoplanin; 12 isolates that were teicoplanin susceptible demonstrated moderate vancomycin resistance with a MIC 16–64 µg/mL (the VanB phenotype).

Reported by: National Nosocomial Infections Surveillance system participating hospitals. Hospital Infections Program, National Center for Infectious Diseases, CDC.

Editorial Note: Vancomycin resistance represents a serious challenge for physicians treating patients with bacterial infections, particularly because many hospital-acquired *E. faecium* strains also are resistant to ß-lactam and aminoglycoside antibiotics (*1*). Treatment options for patients with nosocomial infections associated with vancomycin-resistant enterococci are limited, often to unproven combinations of antimicrobials or experimental compounds (*2*). The data presented in this report suggest that vancomycin resistance among nosocomial enterococci is increasing dramatically, especially in ICUs, and that both the VanA and VanB phenotypes are present among these resistant nosocomial pathogens.

Because information on the myriad of risk factors that influence mortality (e.g., smoking status, age, and comorbidity) are not collected, NNIS data cannot be used to estimate the increased risk for death from a particular site of nosocomial infection.

FIGURE 1. Percentage of nosocomial enterococci reported as resistant to vancomycin isolated from infections in patients in intensive-care units (ICUs) and non-ICUs, by year* — National Nosocomial Infections Surveillance system, 1989–March 31, 1993†



*For 1989–1992, N>1000 isolates for each year; for first quarter 1993, N=291 isolates.
†p<0.0001, chi-square test for linear trend.

Barrier Protection — Continued

Natural-membrane condoms may not offer the same level of protection against sexually transmitted viruses as latex condoms. Unlike latex, natural-membrane condoms have naturally occurring pores that are small enough to prevent passage of sperm but large enough to allow passage of viruses in laboratory studies (*2*).

The effectiveness of spermicides in preventing HIV transmission is unknown. Spermicides used in the vagina may offer some protection against cervical gonorrhea and chlamydia. No data exist to indicate that condoms lubricated with spermicides are more effective than other lubricated condoms in protecting against the transmission of HIV infection and other STDs. Therefore, latex condoms with or without spermicides are recommended.

The most effective way to prevent sexual transmission of HIV infection and other STDs is to avoid sexual intercourse with an infected partner. If a person chooses to have sexual intercourse with a partner whose infection status is unknown or who is infected with HIV or other STDs, men should use a new latex condom with each act of intercourse. When a male condom cannot be used, couples should consider using a female condom.

Data from the 1988 National Survey of Family Growth underscore the importance of consistent and correct use of contraceptive methods in pregnancy prevention (*8*). For example, the typical failure rate during the first year of use was 8% for oral contraceptives, 15% for male condoms, and 26% for periodic abstinence. In comparison, persons who always abstain will have a zero failure rate, women who always use oral contraceptives will have a near-zero (0.1%) failure rate, and consistent male condom users will have a 2% failure rate (*9*). For prevention of HIV infection and STDs, as with pregnancy prevention, consistent and correct use is crucial.

The determinants of proper condom use are complex and incompletely understood. Better understanding of both individual and societal factors will contribute to prevention efforts that support persons in reducing their risks for infection. Prevention messages must highlight the importance of consistent and correct condom use (*10*).

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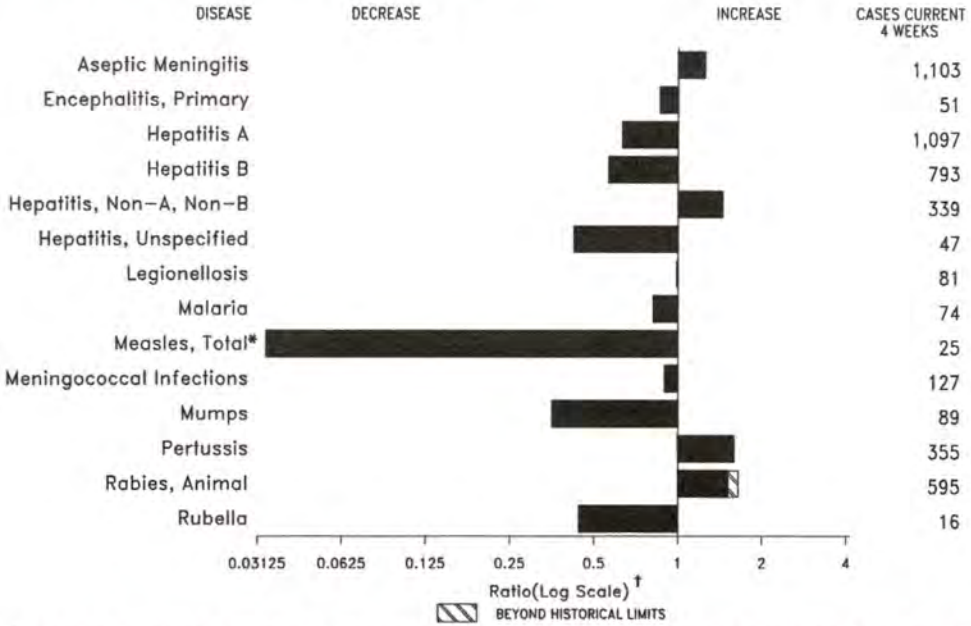
(Continued on page 597)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending July 31, 1993, with historical data — United States



*The large apparent decrease in reported cases of measles (total) reflects dramatic fluctuations in the historical baseline.

† Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending July 31, 1993 (30th Week)

	Cum. 1993		Cum. 1993
AIDS*	67,732	Measles: imported	24
Anthrax	-	indigenous	172
Botulism: Foodborne	8	Plague	3
Infant	14	Poliomyelitis, Paralytic§	-
Other	2	Psittacosis	30
Brucellosis	52	Rabies, human	-
Cholera	15	Syphilis, primary & secondary	15,081
Congenital rubella syndrome	6	Syphilis, congenital, age < 1 year¶	677
Diphtheria	-	Tetanus	18
Encephalitis, post-infectious	96	Toxic shock syndrome	134
Gonorrhea	217,499	Trichinosis	8
Haemophilus influenzae (invasive disease)†	732	Tuberculosis	11,282
Hansen Disease	96	Tularemia	71
Leptospirosis	19	Typhoid fever	180
Lyme Disease	2,934	Typhus fever, tickborne (RMSF)	164

*Updated monthly; last update July 31, 1993.
†Of 672 cases of known age, 219 (33%) were reported among children less than 5 years of age.
§No cases of suspected poliomyelitis have been reported in 1993; 10 cases of suspected poliomyelitis were reported in 1992; 6 of the 9 suspected cases with onset in 1991 were confirmed; the confirmed cases were vaccine associated.
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Barrier Protection — Continued

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Nosocomial Enterococci Resistant to Vancomycin — United States, 1989–1993

As part of continual surveillance for antibiotic resistance among pathogens associated with nosocomial infections, a recent analysis of data reported to CDC's National Nosocomial Infections Surveillance (NNIS) system demonstrated a 20-fold increase in the percentage of enterococci associated with nosocomial infections that are resistant to vancomycin from January 1, 1989, through March 31, 1993. Many of these strains are resistant to all available antimicrobial agents. This report summarizes that analysis.

The NNIS system began in 1970 when selected U.S. hospitals routinely reported nosocomial infection surveillance data for aggregation into a national data base; it is the only source of national data on the epidemiology of nosocomial infections in the United States. Isolates of *Enterococcus* sp. from nosocomial infections reported to the NNIS system from January 1, 1989, through March 31, 1993, were examined. Up to four pathogens could be reported for each episode of nosocomial infection. Multiple isolates of the same species from the same patient were not reported. Information on site of isolation (e.g., respiratory tract or urinary tract), place of acquisition of infection (intensive-care unit [ICU] or non-ICU), medical school affiliation of hospital (teaching or nonteaching), hospital size, and the hospital's susceptibility testing method was obtained for each infection and/or isolate.

Of 16,571 nosocomial *Enterococcus* isolates, 10,961 (66.2%) were tested for vancomycin susceptibility; 278 (2.5%) were resistant. The percentage of nosocomial enterococci resistant to vancomycin increased from 0.3% in 1989 to 7.9% in 1993 ($p<0.0001$, chi-square test). Among patients in ICUs with nosocomial infections, the percentage of enterococcal isolates resistant to vancomycin increased from 0.4% in 1989 to 13.6% in 1993 ($p<0.0001$) (Figure 1). Vancomycin resistance varied by site of infection: gastrointestinal (e.g., intraabdominal abscess), skin and soft tissue, and bloodstream sites had the highest percentage of resistant nosocomial enterococci (7.8%, 4.1%, and 3.8%, respectively).

Of the 10,961 nosocomial enterococcal isolates tested for vancomycin susceptibility and reported to the NNIS system, 1881 were from primary bloodstream infections; 323 (17.2%) patients died. Of the patients with primary bloodstream infection, mortality was significantly higher in those with vancomycin-resistant isolates compared with those with vancomycin-susceptible isolates (26 [36.6%] of 71 versus 297 [16.4%] of 1810; $p<0.0001$, chi-square test). Insufficient data on comorbidity were obtained to determine the relation of the bloodstream infection to death in these patients.

Vancomycin-resistant nosocomial enterococci have been reported from nine of 33 states with NNIS hospitals; the highest percentages were from NNIS hospitals in New York, Pennsylvania, and Maryland (8.9%, 5.6%, and 3.6%, respectively). Vancomycin resistance also varied by teaching affiliation of hospital: 14 (0.6%) of 2154 nosocomial enterococci at nonteaching hospitals were resistant versus 264 (3.0%) of 8807 at teaching hospitals ($p<0.0001$, chi-square test). The percentage of vancomycin resistance varied also by number of beds in the hospital: none of

TABLE III. Deaths in 121 U.S. cities,* week ending July 31, 1993 (30th Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	578	394	103	56	15	10	38
Boston, Mass.	181	110	40	22	4	5	21
Bridgeport, Conn.	33	28	2	2	1	-	2
Cambridge, Mass.	23	17	2	3	-	1	-
Fall River, Mass.	41	30	9	2	-	-	-
Hartford, Conn.	53	30	9	11	1	2	1
Lowell, Mass.	20	15	4	1	-	-	4
Lynn, Mass.	21	18	1	1	-	1	1
New Bedford, Mass.	16	10	2	4	-	-	-
New Haven, Conn.	36	22	9	3	2	-	1
Providence, R.I.	39	27	10	-	2	-	1
Somerville, Mass.	3	3	-	-	-	-	-
Springfield, Mass.	36	25	5	4	2	-	1
Waterbury, Conn.	28	19	6	2	1	-	2
Worcester, Mass.	48	40	4	1	2	1	4
MID. ATLANTIC	2,176	1,375	397	297	74	33	86
Albany, N.Y.	39	25	7	4	-	3	1
Allentown, Pa.	21	18	3	-	-	-	-
Buffalo, N.Y.	100	77	10	7	5	1	3
Camden, N.J.	31	18	4	6	2	1	2
Elizabeth, N.J.	20	16	3	1	-	-	2
Erie, Pa.§	38	30	5	3	-	-	2
Jersey City, N.J.	52	34	10	7	1	-	2
New York City, N.Y.	1,392	831	274	220	51	16	41
Newark, N.J.	38	14	11	8	3	2	4
Paterson, N.J.	21	12	2	2	1	4	-
Philadelphia, Pa.	U	U	U	U	U	U	U
Pittsburgh, Pa.§	85	58	14	8	2	3	8
Reading, Pa.	7	4	2	-	1	-	-
Rochester, N.Y.	126	89	18	14	4	1	12
Schenectady, N.Y.	20	14	6	-	-	-	-
Scranton, Pa.§	29	25	-	3	1	-	2
Syracuse, N.Y.	100	72	18	6	2	2	6
Trenton, N.J.	14	6	4	4	-	-	-
Utica, N.Y.	27	21	4	1	1	-	1
Yonkers, N.Y.	16	11	2	3	-	-	-
E.N. CENTRAL	1,993	1,258	390	182	95	68	86
Akron, Ohio	76	51	16	5	1	3	-
Canton, Ohio	29	22	4	-	2	1	4
Chicago, Ill.	240	106	43	48	37	6	12
Cincinnati, Ohio	125	97	19	4	2	3	9
Cleveland, Ohio	137	84	33	9	7	4	2
Columbus, Ohio	208	122	40	23	12	11	10
Dayton, Ohio	121	85	20	12	4	-	2
Detroit, Mich.	230	125	54	27	13	11	8
Evansville, Ind.	41	30	7	3	-	1	-
Fort Wayne, Ind.	62	41	12	8	-	1	1
Gary, Ind.	26	16	3	4	1	2	-
Grand Rapids, Mich.	44	26	11	3	4	-	8
Indianapolis, Ind.	207	127	50	14	6	10	9
Madison, Wis.	35	29	3	1	1	1	2
Milwaukee, Wis.	126	90	26	8	1	1	9
Peoria, Ill.	57	37	11	4	3	2	2
Rockford, Ill.	41	30	4	3	-	4	3
South Bend, Ind.	39	29	7	-	-	3	2
Toledo, Ohio	95	65	22	4	1	3	1
Youngstown, Ohio	54	46	5	2	-	1	2
W.N. CENTRAL	763	544	124	55	23	17	32
Des Moines, Iowa	94	72	15	5	2	-	6
Duluth, Minn.	23	18	5	-	-	-	1
Kansas City, Kans.	12	9	3	-	-	-	-
Kansas City, Mo.	97	72	13	9	2	1	5
Lincoln, Nebr.	36	29	4	2	1	-	1
Minneapolis, Minn.	160	111	28	13	4	4	5
Omaha, Nebr.	83	57	11	10	1	4	3
St. Louis, Mo.	130	86	21	8	9	6	7
St. Paul, Minn.	61	46	8	2	4	1	3
Wichita, Kans.	67	44	16	6	-	1	1

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,133	690	220	156	39	28	58
Atlanta, Ga.	U	U	U	U	U	U	U
Baltimore, Md.	246	151	47	41	5	2	25
Charlotte, N.C.	108	61	15	18	8	6	3
Jacksonville, Fla.	132	81	33	9	6	3	4
Miami, Fla.	110	70	23	15	1	1	-
Norfolk, Va.	46	24	11	9	2	-	1
Richmond, Va.	68	39	17	7	3	2	4
Savannah, Ga.	51	37	8	5	1	-	4
St. Petersburg, Fla.	47	35	6	2	1	3	5
Tampa, Fla.	142	101	20	17	2	2	11
Washington, D.C.	145	64	32	30	10	9	1
Wilmington, Del.	38	27	8	3	-	-	-
E.S. CENTRAL	740	480	139	55	37	28	47
Birmingham, Ala.	131	83	27	8	5	8	4
Chattanooga, Tenn.	80	53	20	5	2	-	3
Knoxville, Tenn.	61	40	12	6	2	-	5
Lexington, Ky.	81	54	13	4	2	8	10
Memphis, Tenn.	162	101	23	15	15	8	18
Mobile, Ala.	72	46	13	7	5	1	5
Montgomery, Ala.	33	24	7	2	-	-	-
Nashville, Tenn.	120	79	24	8	6	3	2
W.S. CENTRAL	1,438	914	255	170	58	41	82
Austin, Tex.	69	41	17	10	1	-	5
Baton Rouge, La.	20	16	1	2	-	1	-
Corpus Christi, Tex.	42	30	7	3	1	1	1
Dallas, Tex.	187	91	40	36	12	8	4
El Paso, Tex.	84	53	16	5	7	3	3
Ft. Worth, Tex.	81	58	8	10	2	3	4
Houston, Tex.	333	219	65	33	9	7	32
Little Rock, Ark.	83	53	13	12	5	-	5
New Orleans, La.	185	115	25	28	12	5	-
San Antonio, Tex.	195	136	33	16	6	4	15
Shreveport, La.	60	34	13	4	3	6	7
Tulsa, Okla.	99	68	17	11	-	3	6
MOUNTAIN	838	534	167	73	36	28	44
Albuquerque, N.M.	82	49	18	10	4	1	-
Colo. Springs, Colo.	45	24	9	5	2	5	1
Denver, Colo.	108	69	25	9	3	2	5
Las Vegas, Nev.	190	128	36	17	6	3	10
Ogden, Utah	33	22	4	3	3	1	2
Phoenix, Ariz.	169	92	39	15	12	11	6
Pueblo, Colo.	14	10	2	2	-	-	1
Salt Lake City, Utah	79	52	16	5	3	3	11
Tucson, Ariz.	118	88	18	7	3	2	8
PACIFIC	1,979	1,297	363	208	62	38	116
Berkeley, Calif.	20	14	4	2	-	-	4
Fresno, Calif.	26	11	8	3	1	3	1
Glendale, Calif.	31	28	2	1	-	-	2
Honolulu, Hawaii	65	41	14	5	2	3	10
Long Beach, Calif.	72	45	14	9	-	4	10
Los Angeles, Calif.	636	408	102	79	28	8	22
Pasadena, Calif.	24	18	2	1	1	2	2
Portland, Oreg.	137	97	21	12	3	4	4
Sacramento, Calif.	187	130	37	13	5	2	13
San Diego, Calif.	127	79	25	14	3	6	11
San Francisco, Calif.	162	85	41	32	4	-	2
San Jose, Calif.	208	149	33	20	4	2	15
Santa Cruz, Calif.	22	17	3	2	-	-	1
Seattle, Wash.	134	86	31	8	8	1	3
Spokane, Wash.	50	38	10	2	-	-	11
Tacoma, Wash.	78	51	16	5	3	3	5
TOTAL	11,638¶	7,486	2,158	1,252	439	291	589

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.
†Pneumonia and influenza.
§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.
¶Total includes unknown ages.
U: Unavailable.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending July 31, 1993, and July 25, 1992 (30th Week)

Reporting Area	AIDS*	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	67,732	4,737	334	96	217,499	279,888	12,010	6,831	2,624	352	635	2,934
NEW ENGLAND	3,232	74	6	4	4,421	5,822	174	197	272	6	17	661
Maine	94	13	1	-	52	56	8	9	-	-	4	4
N.H.	67	16	-	2	43	73	13	53	246	1	2	30
Vt.	14	17	3	-	15	15	3	5	2	-	-	3
Mass.	1,818	12	1	2	1,378	2,132	49	78	17	5	7	25
R.I.	219	16	1	-	219	422	52	16	7	-	4	108
Conn.	1,020	-	-	-	2,714	3,124	49	36	-	-	-	491
MID. ATLANTIC	15,598	354	25	6	24,907	30,283	634	811	181	4	124	1,661
Upstate N.Y.	2,373	154	18	3	4,490	6,429	202	225	104	1	36	1,000
N.Y. City	8,289	104	1	-	6,768	10,148	177	121	1	-	3	3
N.J.	2,991	-	-	-	4,237	4,256	172	230	53	-	17	300
Pa.	1,945	96	6	3	9,412	9,450	83	235	23	3	68	358
E.N. CENTRAL	5,419	628	88	19	42,369	50,893	1,328	823	402	9	177	25
Ohio	938	216	30	3	12,070	15,632	176	131	31	-	91	17
Ind.	634	85	9	8	4,411	4,732	448	132	8	1	35	4
Ill.	1,939	119	18	2	12,862	16,323	321	140	32	2	8	2
Mich.	1,379	197	26	6	9,831	11,748	127	254	303	6	36	2
Wis.	529	11	5	-	3,195	2,458	256	166	28	-	7	-
W.N. CENTRAL	2,428	282	16	-	11,597	14,729	1,478	372	88	10	43	65
Minn.	511	51	7	-	1,471	1,719	267	40	3	4	1	23
Iowa	141	51	1	-	602	985	24	14	5	1	6	6
Mo.	1,374	69	-	-	6,706	7,963	934	267	62	5	11	7
N. Dak.	1	8	3	-	29	52	54	-	-	-	1	2
S. Dak.	22	7	3	-	164	98	12	-	-	-	-	-
Nebr.	135	6	-	-	476	956	128	11	8	-	21	4
Kans.	244	90	2	-	2,149	2,956	59	40	10	-	3	23
S. ATLANTIC	14,279	1,118	62	40	58,736	87,159	740	1,291	338	47	114	418
Del.	253	29	3	-	795	989	8	99	72	-	9	204
Md.	1,630	102	14	-	9,229	8,539	101	167	8	5	23	68
D.C.	896	23	-	-	2,990	3,829	5	29	-	-	13	2
Va.	1,049	114	22	4	6,869	10,314	91	89	22	20	3	32
W. Va.	46	10	10	-	341	514	8	22	16	-	1	3
N.C.	790	90	12	-	14,418	14,463	39	178	36	-	15	57
S.C.	933	13	-	-	6,032	6,331	9	25	-	1	11	4
Ga.	1,854	69	1	-	4,660	26,750	63	107	41	-	23	26
Fla.	6,828	668	-	36	13,402	15,430	416	575	143	21	16	22
E.S. CENTRAL	1,796	316	16	5	25,176	26,906	147	722	507	1	29	13
Ky.	213	110	9	4	2,668	2,739	71	49	9	-	11	3
Tenn.	731	79	5	-	7,586	8,826	30	607	488	-	13	8
Ala.	531	85	1	-	9,130	8,805	32	63	4	1	2	2
Miss.	321	42	1	1	5,792	6,536	14	3	6	-	3	-
W.S. CENTRAL	6,957	561	26	2	25,961	30,494	1,168	935	151	106	18	22
Ark.	267	26	1	-	4,860	4,602	28	35	2	1	2	1
La.	921	39	1	-	6,726	8,586	46	122	58	2	2	-
Okla.	590	1	6	-	2,063	3,127	73	155	50	6	10	10
Tex.	5,179	495	18	2	12,312	14,179	1,021	623	41	97	4	11
MOUNTAIN	2,948	273	16	4	6,113	7,053	2,379	335	178	57	49	9
Mont.	22	-	-	1	35	60	57	4	2	-	5	-
Idaho	52	7	-	-	101	64	105	27	-	1	1	-
Wyo.	31	5	-	-	57	31	11	16	53	-	5	6
Colo.	985	70	6	-	1,856	2,582	592	47	30	37	5	-
N. Mex.	240	50	3	2	538	522	214	134	58	2	3	-
Ariz.	992	99	5	-	2,260	2,406	833	53	10	7	9	-
Utah	197	9	1	-	198	161	506	25	19	10	7	2
Nev.	429	33	1	1	1,068	1,227	81	29	6	-	14	1
PACIFIC	15,075	1,131	79	16	18,219	26,549	3,962	1,345	507	112	64	60
Wash.	1,008	-	1	-	2,246	2,367	451	122	113	7	9	1
Oreg.	575	-	-	-	1,016	920	58	22	9	-	-	1
Calif.	13,233	1,062	74	16	14,332	22,575	2,927	1,178	374	102	50	57
Alaska	47	9	3	-	294	408	475	6	9	-	-	-
Hawaii	212	60	1	-	331	279	51	17	2	3	5	1
Guam	-	2	-	-	38	48	2	2	-	1	-	-
P.R.	1,950	31	-	-	296	109	52	214	34	2	-	-
V.I.	34	-	-	-	66	61	-	2	-	-	-	-
Amer. Samoa	-	-	-	-	30	24	13	-	-	-	-	-
C.N.M.I.	-	2	-	-	50	49	-	1	-	1	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of Northern Mariana Islands
*Updated monthly; last update July 31, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending July 31, 1993, and July 25, 1992 (30th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	1993	Cum. 1993	Cum. 1992
UNITED STATES	562	5	172	4	24	2,056	1,490	33	1,030	104	1,803	1,121	-	130	121
NEW ENGLAND	29	-	42	-	3	54	60	-	6	10	355	90	-	1	6
Maine	1	-	-	-	-	2	5	-	-	-	8	4	-	1	1
N.H.	6	-	-	-	-	13	12	-	-	5	213	28	-	-	-
Vt.	1	-	30	-	1	-	4	-	-	1	48	3	-	-	-
Mass.	4	-	3	-	1	14	19	-	-	1	44	36	-	-	-
R.I.	2	-	-	-	1	21	1	-	2	-	3	-	-	-	4
Conn.	15	-	9	-	-	4	19	-	4	3	39	19	-	-	1
MID. ATLANTIC	94	-	7	-	3	193	187	3	78	6	232	59	-	36	10
Upstate N.Y.	34	-	-	-	1	109	86	3	27	4	90	28	-	6	7
N.Y. City	24	-	2	-	-	48	19	-	-	-	7	9	-	15	-
N.J.	26	-	5	-	2	36	27	-	8	-	26	22	-	11	3
Pa.	10	-	-	-	-	-	55	-	43	2	109	-	-	4	-
E.N. CENTRAL	29	4	12	1	1	42	236	1	146	11	293	116	-	2	8
Ohio	7	-	5	-	-	6	73	-	57	11	142	29	-	1	-
Ind.	3	-	-	-	-	20	38	-	3	-	35	15	-	-	-
Ill.	14	-	3	-	-	9	65	-	34	-	28	20	-	-	7
Mich.	5	4	4	1§	1	4	41	1	49	-	20	5	-	-	1
Wis.	-	-	-	-	-	3	19	-	3	-	68	47	-	1	-
W.N. CENTRAL	17	-	1	-	2	11	96	-	31	13	138	96	-	1	7
Minn.	3	-	-	-	-	10	6	-	1	13	64	30	-	-	-
Iowa	1	-	-	-	-	1	16	-	7	-	1	3	-	-	2
Mo.	5	-	1	-	-	-	35	-	18	-	48	39	-	1	1
N. Dak.	2	-	-	-	-	-	3	-	4	-	3	10	-	-	-
S. Dak.	2	-	-	-	-	-	3	-	-	-	3	5	-	-	-
Nebr.	3	-	-	-	-	-	8	-	1	-	8	5	-	-	-
Kans.	1	-	-	-	2	-	25	-	-	-	11	4	-	-	4
S. ATLANTIC	170	-	17	-	3	117	293	21	335	27	213	70	-	8	12
Del.	2	-	-	-	-	1	11	-	4	1	6	1	-	2	-
Md.	16	-	-	-	2	16	32	1	57	7	72	14	-	2	4
D.C.	5	-	-	-	-	-	5	-	-	-	2	-	-	-	-
Va.	16	-	-	-	1	14	26	-	16	7	24	6	-	-	-
W. Va.	2	-	-	-	-	-	11	1	9	1	9	2	-	-	1
N.C.	88	-	-	-	-	24	55	19	195	6	35	14	-	-	-
S.C.	1	-	-	-	-	29	24	-	14	3	8	7	-	-	2
Ga.	9	-	-	-	-	-	63	-	14	-	12	8	-	-	-
Fla.	31	-	17	-	-	33	66	-	26	2	45	18	-	4	5
E.S. CENTRAL	18	-	1	-	-	457	91	1	36	10	83	18	-	-	1
Ky.	1	-	-	-	-	440	18	-	-	-	3	-	-	-	-
Tenn.	7	-	-	-	-	-	22	-	11	5	43	5	-	-	1
Ala.	6	-	1	-	-	-	32	1	20	5	35	12	-	-	-
Miss.	4	-	-	-	-	17	19	-	5	-	2	1	-	-	-
W.S. CENTRAL	13	1	2	3	3	1,067	131	4	151	7	56	149	-	16	6
Ark.	2	-	-	-	-	-	14	-	4	-	3	6	-	-	-
La.	-	-	1	-	-	-	25	-	12	-	6	2	-	1	-
Okla.	4	-	-	-	-	11	18	-	8	1	28	24	-	1	-
Tex.	7	1	1	3†	3	1,056	74	4	127	6	19	117	-	14	6
MOUNTAIN	20	-	2	-	-	15	126	-	36	15	153	195	-	5	5
Mont.	2	-	-	-	-	-	11	-	-	-	1	1	-	-	-
Idaho	1	-	-	-	-	-	9	-	5	10	39	23	-	1	1
Wyo.	-	-	-	-	-	1	2	-	2	-	1	-	-	-	-
Colo.	12	-	2	-	-	14	21	-	8	5	55	25	-	-	-
N. Mex.	5	-	-	-	-	-	4	N	N	-	24	42	-	-	-
Ariz.	-	-	-	-	-	-	61	-	6	-	17	79	-	1	2
Utah	-	-	-	-	-	-	11	-	3	-	16	24	-	2	1
Nev.	-	-	-	-	-	-	7	-	12	-	-	1	-	1	1
PACIFIC	172	-	88	-	9	100	270	3	211	5	280	328	-	61	66
Wash.	17	-	-	-	-	10	46	-	9	2	24	92	-	-	6
Oreg.	3	-	-	-	-	3	21	N	N	2	8	17	-	2	1
Calif.	147	-	77	-	4	50	182	3	181	1	237	198	-	35	39
Alaska	1	-	-	-	-	9	13	-	5	-	3	4	-	1	-
Hawaii	4	U	11	U	5	28	8	U	16	U	8	17	U	23	20
Guam	1	U	2	U	-	10	1	U	6	U	-	-	U	-	1
P.R.	-	-	224	-	-	293	6	-	2	-	2	9	-	-	-
V.I.	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	-	-	-	2	6	-	-	-
C.N.M.I.	-	-	-	-	1	-	-	1	12	-	-	1	-	-	-

*For measles only, imported cases include both out-of-state and international importations.
N: Not notifiable U: Unavailable † International § Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending July 31, 1993, and July 25, 1992 (30th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-Shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	15,081	19,653	134	11,282	12,372	71	180	164	4,566
NEW ENGLAND	236	376	8	246	183	-	12	2	596
Maine	3	2	2	7	14	-	-	-	-
N.H.	25	27	2	9	3	-	1	-	47
Vt.	1	1	1	3	3	-	-	-	19
Mass.	86	182	2	130	74	-	7	2	96
R.I.	9	20	1	34	13	-	-	-	-
Conn.	112	144	-	63	76	-	4	-	434
MID. ATLANTIC	1,446	2,809	24	2,696	3,034	1	43	14	1,872
Upstate N.Y.	118	209	13	281	388	1	8	1	1,377
N.Y. City	773	1,570	1	1,579	1,765	-	26	-	-
N.J.	189	382	-	435	519	-	6	9	319
Pa.	366	648	10	401	362	-	3	4	176
E.N. CENTRAL	2,298	2,854	37	1,158	1,227	3	20	7	43
Ohio	689	461	16	179	188	1	5	6	4
Ind.	195	145	1	123	99	1	1	-	3
Ill.	796	1,232	5	551	624	-	9	1	5
Mich.	374	557	15	251	269	1	4	-	4
Wis.	244	459	-	54	47	-	1	-	27
W.N. CENTRAL	961	787	9	251	293	25	2	7	207
Minn.	49	50	2	31	84	-	-	1	27
Iowa	32	31	5	36	24	-	-	1	36
Mo.	774	603	-	126	125	11	2	3	6
N. Dak.	-	1	-	4	4	-	-	-	45
S. Dak.	1	-	-	10	14	10	-	2	25
Nebr.	10	21	-	13	13	1	-	-	6
Kans.	95	81	2	31	29	3	-	-	62
S. ATLANTIC	4,055	5,451	16	1,975	2,263	2	25	79	1,175
Del.	78	130	1	26	25	-	1	2	94
Md.	234	400	-	225	161	-	5	8	342
D.C.	225	249	-	97	77	-	-	-	11
Va.	363	457	4	270	164	-	3	5	215
W. Va.	8	11	-	47	48	-	-	4	50
N.C.	1,128	1,383	3	279	290	1	-	36	51
S.C.	604	723	-	246	234	-	-	6	95
Ga.	684	1,090	2	437	498	-	1	13	275
Fla.	731	1,008	6	348	766	1	15	5	42
E.S. CENTRAL	2,212	2,557	6	761	859	3	3	20	58
Ky.	187	83	2	218	226	-	-	5	9
Tenn.	626	718	1	144	235	2	1	11	-
Ala.	492	966	2	275	231	1	2	2	49
Miss.	907	790	1	124	167	-	-	2	-
W.S. CENTRAL	3,172	3,446	2	1,298	1,227	29	2	31	342
Ark.	498	539	-	108	103	17	-	1	18
La.	1,426	1,482	-	-	107	-	1	1	4
Okla.	241	166	2	166	87	9	-	28	52
Tex.	1,007	1,259	-	1,024	930	3	1	1	268
MOUNTAIN	133	229	8	265	327	4	6	4	73
Mont.	1	7	-	15	-	-	-	-	15
Idaho	-	1	1	7	12	-	-	-	3
Wyo.	4	1	-	2	-	2	-	4	11
Colo.	36	34	2	8	30	-	5	-	2
N. Mex.	19	24	-	35	47	1	-	-	4
Ariz.	57	115	1	126	144	-	1	-	33
Utah	4	6	3	12	51	1	-	-	1
Nev.	12	41	1	60	43	-	-	-	4
PACIFIC	568	1,144	24	2,632	2,959	4	67	-	200
Wash.	34	57	4	149	173	1	4	-	-
Oreg.	50	26	-	68	77	2	-	-	-
Calif.	478	1,052	20	2,246	2,528	1	61	-	183
Alaska	4	4	-	29	40	-	-	-	17
Hawaii	2	5	-	140	141	-	2	-	-
Guam	1	2	-	28	34	-	-	-	-
P.R.	323	181	-	152	135	-	-	-	26
V.I.	31	37	-	2	3	-	-	-	-
Amer. Samoa	-	-	-	2	-	-	-	-	-
C.N.M.I.	3	4	-	19	38	-	-	-	-

U: Unavailable

TALKING POINTS & SUPPORTING DATA:
MMWR ON THE EFFECTIVENESS OF CONDOMS

1. **Latex condoms are highly effective against the sexual transmission of HIV when used consistently and correctly during sexual intercourse.**

   - New, compelling studies demonstrate that latex condoms are highly effective when used correctly and consistently. (MMWR)

   - Two studies present the strongest evidence to date that latex condoms are highly effective in preventing HIV. The studies monitored people at extremely high risk by studying couples in which one person was HIV-positive and the other was uninfected. With repeated exposures to HIV, condoms proved to be highly effective for couples using condoms consistently and correctly.

   - Of 123 couples studied from 1987 to 1991, in which one of the partners was HIV-infected and they consistently and correctly used condoms, **none** of their partners became infected. However, among 122 couples who inconsistently used condoms, 10% (12 of 122) became infected. (DeVincenzi)

   - In an Italian study of uninfected female partners of HIV-infected men, only 2% (3 of 171) of the women whose male partners always used condoms during sexual activity became infected. However, 15% (8 of 55) of inconsistent condom users became infected. (Saracco)

2. **Latex condoms must be used consistently and correctly in order to be highly effective in preventing the transmission of HIV.**

   - Consistent use means using a condom from start to finish with **every** act of intercourse.

   - Correct use involves a few simple steps.

   - Use a new condom **every time** you have sex -- anal, oral or vaginal.

   - Put the condom on after the penis is erect and before it touches any part of your partner's mouth, anus, or vagina. (If the penis is uncircumcised, pull the foreskin back before putting on the condom).

- To put the condom on, pinch the reservoir tip of the condom, then unroll it all the way down the penis. (If the condom does not have a reservoir tip, pinch the tip enough to leave a half-inch space for semen to collect.) Always insure that no air is trapped in the tip. It can cause the condom to break.

- If you feel a condom break during sex, stop, pull out, and put on a new condom.

- After ejaculation and while the penis is still erect, hold the rim of the condom and carefully withdraw so no semen is spilled.

- Using lubricants: you may want to apply additional lubrication to reduce the possibility the condom will break. You should only use **water-based** lubricants, such as glycerin or over-the-counter lubricating jelly.

  Never use "oil-based" products with condoms, such as cooking or vegetable oils, baby oil, hand lotion, or petroleum jelly. They can weaken the latex and cause the condom to break.

- Storing condoms: Condoms should be stored in a drawer or closet -- somewhere cool, dry and out of direct sunlight. Changes in temperature, rough handling or age can make the latex brittle or gummy. Never use condoms that are damaged or discolored, brittle, or sticky. And don't store them in your wallet or car glove compartment for a long time.

3. Latex condoms are excellent quality products.

- Recognizing that latex condoms are highly effective, in April 1993 the FDA announced that labeling for latex condoms should inform the public that: "if used properly, latex condoms will help to reduce the risk of transmission of HIV infection and many other STDs." Other contraceptives are required to carry a statement that they do *not* protect against HIV infection and other STDs.

- Studies by the FDA Center for Devices and Radiological Health confirm that latex condoms are a highly effective mechanical barrier to HIV-sized particles.

- During the manufacturing process, condoms are double-dipped in latex and undergo stringent quality control procedures.

4. **As a medical device, latex condoms are rigorously tested to ensure that they meet federal and industry quality assurance standards.**

- Every condom manufactured in the United States is tested by manufacturers for defects, including holes or areas of thinning, before it is packaged.

- The FDA randomly tests condoms produced domestically or imported into the U.S. to ensure that they meet quality assurance requirements. The standard test used by the FDA is the water-leak test, in which the condom is filled with 300 ml of water, stretching it to as much as four times its original size. If FDA finds that more than 4 per 1000 condoms leak, the lot is not allowed to be sold here.

5. **When condoms fail, it is usually due to user error.**

- Most condom breakage is due to incorrect usage rather than poor condom quality. Common reasons for breakage include teeth or fingernail tears, using oil-based lubricants, using old condoms, exposure to heat, reusing condoms, unrolling the condom before putting it on, or leaving air in the tip.

- There is no indication that condom breakage rates are different for anal or vaginal intercourse.

- Many Americans don't know that latex condoms provide better protection from HIV than natural membrane condoms, and don't understand that they should be used from start to finish, or that only water-based lubricant should be used. It is vital to step up our efforts in educating the public about correct condom use.

6. **Both refraining from intercourse with infected partners and consistent and correct condom usage are effective prevention strategies.**

- A two-pronged AIDS prevention approach is needed in this country -- with messages encouraging both abstinence and the correct and consistent use of condoms. Both strategies can be highly effective if practiced all the time.

- We know that one of the key determinants of condom use is the belief that condoms work. Stated another way, sexually active individuals will be less motivated to use condoms if they don't believe that they will be effective barriers. Therefore, it is important that sexually active individuals get the message that latex condoms provide effective protection from HIV if they are

used correctly and consistently. We have a responsibility to let the public know that a compelling case now exists for condom use as a prevention strategy -- if condoms are used consistently and correctly.

- A clear message about condoms is not incompatible with the message to young people that initiation of sexual activities at an early age carries health risks. In fact, recent data from Switzerland demonstrates that a public education campaign promoting condom use can be effective without increasing the proportion of adolescents who are sexually active. (Hausser)

QUESTIONS & ANSWERS: MMWR ON THE EFFECTIVENESS OF CONDOMS

	QUESTION	ANSWER
1	**What about studies that suggest condoms have as high as a 15.7% contraceptive failure rate?**	These studies do not distinguish between inconsistent and consistent condom use. Recent studies show that pregnancy rates are estimated to be as low as 2% for couples who use condoms consistently and correctly. (Trussell) Similarly, in two studies involving extremely high-risk couples in which one partner was HIV-infected and the other was not, condoms were found to be highly effective when used consistently and correctly.
2	**What does highly effective mean?**	We know from the discordant couple studies that in extreme risk situations, the consistent use of condoms provides a significant reduction in risk. (Refer back to Talking Point #1 about discordant couple studies)
3	**Isn't it naive to think that people can use condoms consistently and correctly?**	No, people can use condoms correctly by following a few simple steps (See talking points). Discordant couple studies clearly demonstrate that consistent and correct condom use is possible if the couple is highly motivated.

4	**Can't condoms break?**	Condoms rarely break. In those cases where breakage occurs, it is usually related to user error rather than condom quality. Using old condoms is a leading cause of breakage. Other common reasons for breakage include fingernail tears, exposure to heat or sunlight, reusing condoms, or unrolling the condom before putting it on. Use of oil-based lubricants such as baby oil, vegetable oil, petroleum jelly, and cold cream can weaken latex condoms considerably and cause them to break. Mineral oil, a common ingredient of hand lotions can cause a 90% decrease in condom strength after as little as 60 seconds of exposure. (Voeller)

5	**How are condoms regulated and tested?**	Condoms are classified as medical devices, regulated by the FDA, and manufactured according to national standards. Every condom sold in the U.S. is tested by the manufacturer electronically for defects, including holes or areas of thinning, before it is packaged. During the manufacturing process, condoms undergo stringent quality testing. In addition, the FDA randomly tests condoms using the water-leak test, in which a condom is filled with 300 ml of water. If FDA finds that more than four per 1000 condoms leak, the lot is not allowed to be sold here.
6	**Don't condoms have microscopic holes that allow HIV to pass through?**	Condoms are required to undergo demanding tests, including tests for holes before they are sold. If any holes are found, the condoms are discarded. Laboratory studies show that intact latex condoms provide a continuous barrier to microorganisms as well as sperm.
7	**Researchers studying surgical gloves made out of latex found "channels of 5 microns that penetrated the entire thickness of the glove."**	The quality of latex condoms is higher than that of latex gloves. Condoms are made differently than gloves. Condoms are doubled-dipped in latex while gloves are only single-dipped. Condoms also undergo much more stringent quality control procedures than gloves.

8	**What about a University of Texas Medical Branch study that estimated condoms to be only 69% effective in preventing HIV in heterosexual couples?**	The University of Texas did not conduct a new study. It is a meta-analysis of existing studies. That is, it applied statistical methods to previously published studies. This method has several flaws. First, the study only cites data collected prior to July 1990, overlooking recent studies that provide some of the most compelling evidence that condoms are effective. Second, the study did not distinguish between consistent and inconsistent use of condoms.
9	**Why did the FDA approve the female condom if it has proven to be only 74% effective in recent studies?**	The female condom is the first barrier method of contraception available within the control of the female partner which provides some level of protection against pregnancy and STDs, including HIV. As a very new product, limited studies have been conducted on its effectiveness against STDs and HIV. However, the clinical data do suggest that female condoms provide some level of protection against some STDs and HIV. PHS is currently undertaking additional studies to assess the effectiveness of female condoms against HIV and other STDs as well as to develop additional methods of contraception for women.

10	**Isn't abstinence the only foolproof way to prevent HIV infection?**	Refraining from intercourse with infected partners is the most effective HIV prevention strategy. This is an especially important message for young people. There is little disagreement that premature initiation of sexual activity carries health risks. We need to strive for a climate supportive of young people who are choosing to delay sexual activity. Periodic abstinence, however, carries with it certain risks. A 1988 National Survey of Family Growth found abstinence to have a contraceptive failure rate of 26% when not practiced consistently. So, in abstinence -- as in condom use -- consistency is key.
11	**Why are you changing your position on the effectiveness of condoms used in conjunction with a spermicide?**	Scientific studies show that condoms are more effective than many people previously thought and that spermicides may be less effective than had been hoped. CDC recommendations actually are not changing significantly. We are reinforcing the recommendation to use condoms. We don't encourage the use of spermicides except as an adjunct to condoms and for those whose goal is contraception.

12	**Is the federal government advocating/condoning sexual intercourse outside of marriage?**	There are many sound public health reasons to abstain from sexual intercourse, such as preventing STDs, including HIV, and unwanted pregnancy. However, the federal government does not determine what is or is not morally acceptable behavior. From a public health perspective, if a person chooses to have sexual intercourse, using condoms correctly every time during sex is the best way to prevent HIV infection.

13	**Why are you releasing this information now? Aren't people already using condoms?**	We are releasing this information now because recently presented scientific data sheds new light on this important public health issue. We feel the public needs this information, and the MMWR is the most rapid means to disseminate it to health professionals and the public. Most sexually active people are not using latex condoms every time they have sex. For example, in San Francisco, only 6% of heterosexual males with multiple sex partners reported always using condoms. In another study, only about 20% of sexually active American women reported that their male partners used condoms. A national survey of heterosexual adults with multiple sex partners found only 17% used condoms all of the time (Catania). One of the key determinants of condom use is the belief that they work. Therefore, it is important for sexually active individuals to get the message that latex condoms can provide effective protection from HIV if they are used correctly and consistently.

14	**Don't education programs about condoms result in increased sexual activity among adolescents?**	No. Several studies have shown that levels of sexual activity among young adults decreased or remained the same after sex education programs which included information about condoms. In a recent Swiss study of 16-19 year olds, an AIDS prevention effort focusing on condom use did not increase the level of sexual activity or the number of sex partners of young people. However, condom use did increase among those already sexually active. A 1992 study reported in Family Planning Perspectives found that AIDS education and sex education resulted in decreases in the number of sex partners and the frequency of intercourse. Having received education was also associated with more consistent condom use.
15	**In choosing a condom, is there any way to know which brand is best? Do some condoms have higher quality standards than others?**	All of the condoms marketed in the U.S. today meet federal quality assurance standards. The CDC recommends latex condoms for prevention of HIV and STDs. Consumers should look for the word "latex" on the package. Color, shape, and packaging are all issues of personal preferece. All are effective.

16	**What are you going to do now that you have this information? Is the government going to start a condom promotion campaign? Are you going to release ads on condoms?**	The CDC is now planning the next stage of its HIV Public Information Program. It will include the implementation of a 5-year prevention marketing program to prevent the sexual transmission of HIV among sexually active young Americans. The CDC is faced with opposition regarding condoms from both sides of the issue. Some people want the CDC to promote only abstinence as a strategy to prevent HIV and not to discuss condoms at all. Others say the CDC is not talking enough about condoms. The CDC's education programs are driven by science. As the nation's leading prevention agency, our mission is to prevent disease and protect the health of all Americans. For people who are sexually active, it is our duty to provide them with accurate, scientific information about the effectiveness of condoms against STDs, including HIV when they are used correctly and consistently. CDC-supported public health and education programs provide young Americans with information about the actions they can take to reduce their risk of acquiring HIV infection, including delaying and abstaining from sexual activity.

17	**Why are you promoting this information now?**	Two recent studies -- especially the discordant couple studies -- have provided the data to make a compelling new case for condom effectiveness.
18	**Why are you promoting condoms even though they're not foolproof?**	Because they substantially reduce the risk of HIV infection during vaginal, anal or oral sex. Similarly, we promote many other health behaviors that significantly reduce risk, but do not entirely eliminate it. For example, we promote wearing bicycle helmets which are 85% effective at reducing injury or death and wearing seat belts which are 40-55% effective at reducing injury.

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These print PSAs are part of the CDC's America Responds to AIDS library of materials. They were originally developed and distributed in 1988.

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

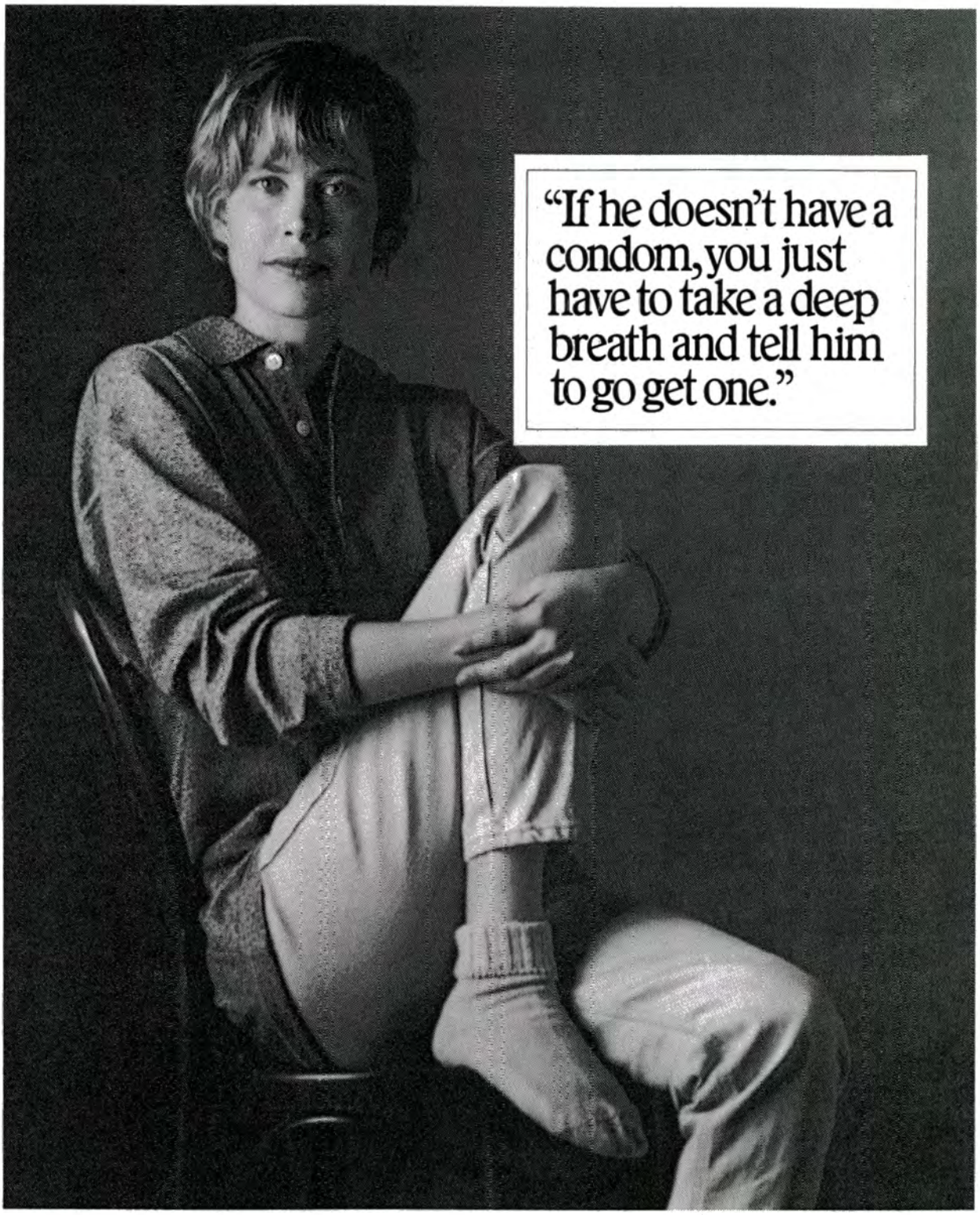
If you want him to use a condom, this is all you have to say.

AMERICA RESPONDS TO AIDS

If you'd like information about condoms, HIV, and HIV prevention, call 1-800-342-AIDS.

CDC

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service



It's not the easiest thing in the world to say.

But these days, you have to. If you're dating someone who doesn't like condoms, talk before having sex. Explain how you feel. Offer to help during the awkward moments. And if this doesn't work, ask yourself, is it worth the risk?

For more information on condoms and AIDS, call 1-800-342-AIDS for answers you can count on.

AMERICA RESPONDS TO AIDS

CDC

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

What Have You Got Against A Condom?

The simple act of putting on a condom can save your life, if they're used properly and every time you have sex. For more information about AIDS and condoms, call 1-800-342-AIDS.

AMERICA RESPONDS TO AIDS

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U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

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