



The Foundation  
for AIDS Research

# issue brief

## The Effectiveness of Condoms in Preventing HIV Transmission

In the context of U.S. government policies and programs for combating HIV/AIDS domestically and internationally, a debate has resurfaced about the effectiveness of condoms in preventing the sexual transmission of HIV infection. Some recent U.S. government policies have begun to shift emphasis to the *lack* of condom effectiveness in educational materials and other publications and programs that receive federal funds. This shift has caused confusion in the general public about whether condoms should be used and promoted for preventing HIV infection. In response to these developments, it is important to restate the scientific evidence related to condom effectiveness for the prevention of HIV/AIDS.

### Efficacy and Effectiveness

When assessing how well condoms work for preventing HIV and other sexually transmitted diseases (STD), some experts make the distinction between condom efficacy and effectiveness.

- *Efficacy* is defined as the protection the user would receive under “ideal” conditions, and depends primarily on the properties of the device (condom) as tested in controlled studies among a sample of people.
- *Effectiveness* is defined as the protection the user would receive under “actual” or “real-life” conditions, and depends on the properties of the device (condom) and the behaviors of the user.<sup>1</sup>

Both constructs are important for evaluating condoms as an HIV prevention tool. But most studies measure product characteristics and user behaviors that likely are neither ideal nor actual (typical). Thus, “condom effective-

ness” is generally used to refer to the level of protection against HIV and other STDs when condoms are used consistently and correctly.

### Male Condom Effectiveness

In 2000, the National Institute of Allergy and Infectious Diseases (NIAID), in partnership with other federal agencies, held a workshop entitled “Scientific Evidence on Condom Effectiveness for Sexually Transmitted Disease Prevention.”<sup>1</sup> Participants reviewed the published literature on the effectiveness of the male latex condom for preventing HIV and seven other STDs during vaginal intercourse. The workshop summary report concluded the following:

- Prospective studies among different population groups have demonstrated the effectiveness of male condoms in preventing sexual transmission of HIV infection when used during sexual intercourse. Specifically, published systematic reviews and meta-analyses of condom use studies—in which the data

and outcomes from multiple studies are pooled to obtain an overall summary finding—have concluded that:

When male condoms are used correctly and consistently, they are 80-95% effective in reducing the risk of HIV infection.<sup>2-5</sup>

- Laboratory studies, including those conducted by the FDA, have established that male latex condoms are essentially impermeable to particles the size of STD pathogens, including HIV. Thus, they provide a highly effective barrier method when used correctly.

### Female Condom Effectiveness

The female condom is a lubricated polyurethane sheath with a ring on either end that is inserted into the vagina before sex. It can be inserted up to eight hours before intercourse and does not necessarily have to be removed immediately after ejaculation. It also can be

<sup>1</sup> National Institute of Allergy and Infectious Diseases. Workshop summary: Scientific evidence on condom effectiveness for sexually transmitted disease prevention. National Institutes of Health, 2001. <sup>2</sup> Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission. *Cochrane Database Syst Rev* 2004(1): CD003255. <sup>3</sup> Hearst N, Chen S. Condoms for AIDS prevention in the developing world: A review of the scientific literature. University of California, 2003. <sup>4</sup> Pinkerton SD, Abramson PR. Effectiveness of condoms in preventing HIV transmission. *Soc Sci Med* 1997;44(9):1303-12. <sup>5</sup> Holmes KK, Levine R, Weaver M, PhD. Effectiveness of condoms in preventing sexually transmitted infections. *Bulletin of the World Health Organization* 2004;82(6).

re-used (after washing, drying, disinfecting, and re-lubricating). The female condom offers the possibility of a woman-controlled HIV prevention method.

The female condom has been studied for both efficacy and effectiveness, primarily for non-HIV STD prevention and for pregnancy prevention. Laboratory studies and clinical trials have shown that the female condom provides an effective barrier to organisms even smaller than those known to cause STDs, and is at least equivalent to the male condom in preventing gonorrhea, trichomoniasis, and chlamydia. To date, no clinical trial has specifically assessed the efficacy of the female condom in preventing HIV infection. However, based on the STD and pregnancy prevention studies:

It is estimated that the female condom is 94-97% effective in reducing the risk of HIV infection if used correctly and consistently.<sup>6</sup>

## Targeted and Universal Prevention

When considering the promotion of condoms for HIV prevention, some (including the U.S. government in the President's Emergency Plan for AIDS Relief—PEPFAR) distinguish between "targeted" and "universal" approaches.

- Targeted prevention is prevention for individuals and populations determined to be at elevated risk of HIV infection, e.g., sex workers, injection drug users, men who have sex with men, and sero-discordant couples (in which only one partner has HIV infection).
- Universal prevention is prevention for the entire population.<sup>7</sup>

Both targeted and universal prevention to increase condom use are important strategies for halting the spread of HIV/AIDS. Targeted approaches have been especially effective among female sex workers, injection drug users (IDUs), and men who have sex with men.

- In its 100% Condom Program, the Thai government mandated condom use for female sex workers and their clients. As a result, condom use increased and the number of new HIV infections in Thailand is estimated to have decreased by more than 80% by the end of 2000.<sup>8,9</sup>
- Targeted interventions, including male condom distribution coupled with peer-led education on safe sex behaviors, peer outreach, and treatment of STIs, have been shown to increase condom use among IDUs in both developed and developing countries.<sup>10,11</sup>
- In the early years of the U.S. AIDS epidemic, condom promotion efforts specifically targeting gay men in HIV epicenters, such as San Francisco, successfully increased condom use;<sup>12</sup> and more recent behavioral interventions have increased condom use and decreased HIV infection among men who have sex with men.<sup>13</sup>

Universal approaches to increasing condom use also have proven effective.

- Mass media campaigns focused on the distribution and promotion of condoms, comprehensive HIV/AIDS education for young people, behavioral interventions aimed at heterosexual adults, and peer-led interventions for women have all increased condom use among adults and adolescents.<sup>14-17</sup>

Programs to halt the spread of HIV/AIDS must include both targeted and universal approaches and be comprehensive. In addition to implementing biomedical and behavioral interven-

tions for reducing HIV rates among populations or individuals at high risk, programs must decrease HIV/AIDS-related discrimination, provide information about HIV/AIDS, and ensure access to tools to promote risk reduction behavior, including use of condoms.<sup>7,18</sup>

## Conclusion

In summary, the scientific evidence does not support the recent shift in U. S. government policy that stresses lack of condom efficacy in educational materials and other publications from organizations that receive federal funds. Rather, the evidence shows that both male and female condoms are highly effective in preventing the transmission of HIV/AIDS, especially when used as part of a comprehensive prevention program.



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**6** Trussell J, Sturgen K, Strickler J, Dominick R. Comparative contraceptive efficacy of the female condom and other barrier methods. *Family Planning Perspectives* 1994;26(2). **7** Des Jarlais DC, Padian NS, Winkelstein W, Jr. Targeted HIV-prevention programs. *N Engl J Med* 1994;331(21):1451-3. **8** Rojanapithayakorn W, Hanenberg R. The 100% condom program in Thailand. *AIDS* 1996;10(1):1-7. **9** UNAIDS. Connecting lower HIV infection rates with changes in sexual behaviour in Thailand: Data collection and comparison. *UNAIDS Best Practice Collection*, UNAIDS, 1998. **10** Merson MH, Dayton JM, O'Reilly K. Effectiveness of HIV prevention interventions in developing countries. *AIDS* 2000;14 Suppl 2:S68-84. **11** Semaan S, Des Jarlais DC, Sogolow E, Johnson WD, Hedges LV, Ramirez G, Flores SA, Norman L, Sweat MD, Needle R. A meta-analysis of the effect of HIV prevention interventions on the sex behaviors of drug users in the United States. *J Acquir Immune Defic Syndr* 2002;30 Suppl 1:S73-93. **12** Catania JA, Coates TJ, Stall R, Bye L, Kegeles SM, Capell F, Henne J, McKusick L, Morin S, Turner H, et al. Changes in condom use among homosexual men in San Francisco. *Health Psychol* 1991;10(3):190-9. **13** Koblin B, Chesney M, Coates T. Effects of a behavioural intervention to reduce acquisition of HIV infection among men who have sex with men: The EXPLORE randomised controlled study. *Lancet* 2004;364(9428):41-50. **14** Choi KH, Coates TJ. Prevention of HIV infection. *AIDS* 1994;8(10):1371-89. **15** Wingood GM, DiClemente RJ. HIV sexual risk reduction interventions for women: A review. *Am J Prev Med* 1996;12(3):209-17. **16** Mullen PD, Ramirez G, Strouse D, Hedges LV, Sogolow E. Meta-analysis of the effects of behavioral HIV prevention interventions on the sexual risk behavior of sexually experienced adolescents in controlled studies in the United States. *J Acquir Immune Defic Syndr* 2002;30 Suppl 1:S94-S105. **17** Yamada J, DiCenso A, Feldman L, Cormillott P, Wade K, Wignall R, Thomas H. A systematic review. Ontario (Canada) Ministry of health, Social and Public Health Services Division, 1999. **18** Global HIV Prevention Working Group. Access to HIV prevention: Closing the gap. 2003.