

# PSI Issue Brief

## SOCIAL MARKETING AND COMMUNICATIONS FOR HEALTH

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### Effectiveness of Male Condoms: Frequently Asked Questions

More than two decades of research and experience have provided new insights into the role of male condoms for contraception and HIV prevention. However, given that the number of people infected and living with HIV continues to grow, it is essential to reassess what we have learned about HIV prevention. This is especially true regarding condoms, the controversial mainstay of HIV prevention programs. Opinions on condoms are often based on ideology rather than evidence, though evidence has accumulated steadily. The following is a list of frequently asked questions and answers about condom efficacy.

#### Are condoms effective in preventing pregnancy?

- Condoms are between 85% and 98% effective at preventing pregnancy.
  - Planned Parenthood estimates that condoms are 85% effective at preventing pregnancy with typical use and 98% effective with perfect use (perfect use is defined as using a condom correctly during all instances of vaginal intercourse).
  - Stated differently, of 100 women whose partners use condoms, approximately 15 will become pregnant during the first year of typical use. With perfect use, assuming conventional fertility rates, approximately two women will become pregnant. In contrast, among 100 women who use no protection, 85 will become pregnant within the first year.<sup>1</sup>

#### Are condoms effective in preventing HIV infection?

- *Efficacy* refers to how well an intervention treats or prevents a condition under ideal and controlled conditions.
  - Condom efficacy is nearly impossible to measure because it requires observation of condom use among discordant couples (one partner is HIV-positive, the other is HIV-negative) to assure correct and consistent condom use. Furthermore, it would require random allocation of couples to condom use and non condom groups to compare transmission rates. For obvious ethical and practical reasons, such a study has never been conducted.
- *Effectiveness* refers to how well an intervention works under real-world conditions. Condoms are *highly effective* in preventing HIV, with studies demonstrating effectiveness rates between 80-95%.<sup>2</sup>
  - In 1999, a meta-analysis was done of findings from 25 published studies with sero-discordant couples reporting consistent condom use versus those reporting never using condoms. The study found an 87% effectiveness rate for condoms in HIV prevention.<sup>3</sup>
  - A 2004 meta-analysis of studies with sero-discordant couples found an 80% effectiveness rate in preventing HIV.<sup>4</sup>
  - In a 2005 brief based on multiple studies, the American Foundation for AIDS Research found that correct and consistent male condom use is 80-95% effective in reducing the risk of HIV infection.<sup>5</sup>

<sup>1</sup> Planned Parenthood. 2004. "Condoms." [www.plannedparenthood.org/birth-control-pregnancy/birth-control/condom.htm](http://www.plannedparenthood.org/birth-control-pregnancy/birth-control/condom.htm).

<sup>2</sup> Ibid.

<sup>3</sup> Davis K and Weller SC. 1999. "The effectiveness of condoms in reducing heterosexual transmission of HIV." *Family Planning Perspectives*. 31(6):272-279.

<sup>4</sup> Weller SC and Davis-Beatty K. 2002. "Condom effectiveness in reducing heterosexual HIV transmission." *Cochrane Database of Systematic Reviews*. Issue 1. Art. No.: CD003255. DOI: 10.1002/14651858.CD003255.

<sup>5</sup> American Foundation for AIDS Research (AMFAR). 2005. "Issue brief: the effectiveness of condoms in preventing HIV transmission." [http://www.amfar.org/binary-data/AMFAR\\_PUBLICATION/download\\_file/34.pdf](http://www.amfar.org/binary-data/AMFAR_PUBLICATION/download_file/34.pdf).

- Condoms cannot be penetrated by particles the size of the HIV virus or the size of sperm cells. This suggests that with perfect use, the ability of condoms to prevent HIV would be even greater.<sup>6</sup>

Condoms are the only available contraceptive method that provides dual protection, preventing both sexually-transmitted infections such as HIV and unintended pregnancies.<sup>7</sup>

### **Why is condom effectiveness somewhat different for HIV (80-95%) and pregnancy prevention (85-98%)?**

- Condom effectiveness is higher in pregnancy prevention than for HIV prevention because women have a limited period during each month (and during their life cycle) in which they are able to conceive.
- In contrast, HIV-positive individuals may be able to infect their partner over a longer period of time, with the risk of transmission higher among individuals with genital ulcers and/or higher HIV viral loads.<sup>8,9</sup>

### **How can condoms impact the HIV epidemic at the country level?**

- Condom effectiveness relies on individual choices and ability to use condoms consistently and correctly. Other factors affecting the impact of condoms on an epidemic include the quality of condoms and their availability. The choice to use condoms with different types of partners (regular vs. non-regular or concurrent partners) plays an important role in transmission dynamics. Furthermore, viral load of an HIV-positive individual increases the risk of transmission.<sup>10</sup>

- Widespread condom distribution will not impact the epidemic in countries if individuals do not use condoms consistently, especially with high risk or multiple partners. Many studies find inconsistent users are at greater risk for HIV infection than those who never use (in part due to other confounding risk behaviors among inconsistent users such as drug or alcohol use).<sup>11</sup>
- Other factors such as concurrent partnerships and low rates of condom use with high-risk (non-regular, concurrent and/or transactional) partners diminishes the impact of condoms on decreasing HIV transmission, even when overall condom use is relatively high.<sup>12</sup>
- Promoting condoms to groups at highest risk, such as sex workers and clients in Thailand and Cambodia, has been observed to play a major role in decreasing HIV transmission.<sup>13</sup> These countries experienced high rates of consistent condom use among individuals practicing highest risk behavior; such high rates of use are referred to as “thresholds.”<sup>14</sup> In countries with high prevalence in the general population, the threshold for consistent condom use required to halt or reverse HIV epidemics is higher. More research is needed to better understand these condom-use thresholds and other factors affecting them, including rates of concurrent partnerships.<sup>15</sup>

### **Does the availability of condoms lead to increased sexual activity?**

- Multiple studies among youth in US schools have shown that while availability of condoms may slightly increase the likelihood that sexually active students will increase condom use, condom availability did not increase sexual activity among students.<sup>16-18</sup>

<sup>6</sup> Centers for Disease Control and Prevention (CDC). 2000. “Fact sheet for public health personnel: male latex condoms and sexually transmitted diseases.” <http://www.cdc.gov/nchstp/od/latex.htm>.

<sup>7</sup> Walsh T and Frazier R et al. 2003. “Use of prostate-specific antigen (PSA) to measure semen exposure resulting from male condom failures: implications for contraceptive efficacy and the prevention of sexually transmitted disease.” *Contraception*. 67:139-150.

<sup>8</sup> McNeill ET and Gilmore CE et al. 1998. *The Latex Condom: Recent Advances, Future Directions*. Research Triangle Park, NC: Family Health International.

<sup>9</sup> Gray RH and Wawer MJ et al. 2001. “Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda.” *The Lancet*. 14;357(9263):1149-53.

<sup>10</sup> Hearst N and Chen S. 2004. “Condom promotion for AIDS prevention in the developing world: Is it working?” *Studies in Family Planning*. 35(1):39-47.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Hearst and Chen.

<sup>14</sup> MAP Project. 2004. *AIDS in Asia: Face the Facts*. Family Health International: Washington DC.

<sup>15</sup> Hearst and Chen.

<sup>16</sup> Guttmacher S and Lieberman L et al. 1997. “Condom availability in New York City public high schools: relationships to condom use and sexual behavior.” *American Journal of Public Health*. 87(9):1427-33.

<sup>17</sup> Schuster MA and Bell RM et al. 1998. “Impact of a high school condom availability program on sexual attitudes and behaviors.” *Family Planning Perspectives*. 30(2):67-72, 88.

<sup>18</sup> Furstenberg FF Jr and Geitz LM et al. 1997. “Does condom availability make a difference? An evaluation of Philadelphia’s health resource centers.” *Family Planning Perspectives*. 29(3):123-7.

- ❑ Only one study in Uganda found that condom promotion did have an impact on sexual disinhibition. The study demonstrated an increase in condom use but also an increase in the number of sex partners among study respondents.<sup>19</sup>

### How often do condoms fail, and what causes condom failure?

- ❑ Condom technology and quality assurance have improved such that condom failure due to defects is very rare.<sup>20</sup> Condoms procured by PSI adhere to WHO standards for manufacturing and quality control. PSI pre-qualifies and monitors condom suppliers and tests condoms for defects prior to and after shipment.<sup>21</sup>
- ❑ Most condom failure is due to incorrect use and inadequate knowledge. A multi-country study of failure rates among men found that those who reported prior condom failure were nearly twice as likely to experience condom failure during the study. Further, researchers found that lower educational attainment was associated with condom failure. Common behaviors that increase the risk of condom breakage are opening the condom package with sharp objects or teeth, unrolling the condom before placing it on the penis, and putting the condom on inside out. Common behaviors that promote condom slippage are withdrawing the penis when it is no longer erect and not holding onto the condom while withdrawing.<sup>22</sup>
- ❑ Condom failure may be due to late condom use. A study of university students in Australia found that 38% of respondents reported putting a condom on after initial penetration, comprising 13% of sexual encounters. While late condom use is preferable to unprotected sex, it increases risk of transmission and may impact clinical studies, leading to underestimation of condom effectiveness rates.<sup>23</sup>

### Why promote condoms if they sometimes fail?

- ❑ Evidence suggests that even condoms that fail provide some protection. A study of condom failure

(breakage and slippage) examined exposure to semen during condom failure versus semen exposure during unprotected sex.<sup>24</sup> The study found that condom failures were rare and that among 97% of women who experienced condom failure, semen was found in the vagina. However, the amount detected was significantly lower than in the comparison group.<sup>25</sup>

- ❑ There are many things in life that increase safety without being 100% effective. For example, use of seat belts reduces the risk of fatal injury to front-seat passengers by 45%.<sup>26</sup> Bicycle helmets are 85% effective at reducing injury or death, yet few question the value of seat belts or bicycle helmets or calls for anyone to “abstain” from driving or bicycling. It is only with condoms that the small failure rate is given as a reason for not using them.

### Why is HIV prevalence so high in some African countries with high condom availability?

- ❑ Condom critics have pointed out that some African countries with high condom availability — including Zimbabwe and Kenya — also had some of the highest HIV rates, and presented this as proof that condoms were ineffective. HIV prevalence in both countries now appears to be declining.<sup>27</sup> However, the availability of condoms is relatively high due to the fact that few condoms are actually distributed compared to need because demand is low.
- ❑ Other experts argue that as people become more aware of HIV infection in their community, condom use rises rapidly in response, especially among those who know or suspect that they (or their partner) are infected. Writes Dr. Andy Haines, dean of the London School of Hygiene and Tropical Medicine: “This is what we think is reflected in the positive association between trends in national HIV prevalence and condom use. It also explains why behavioral surveys often find a higher level of condom use amongst those who are infected than amongst the uninfected. The same kind of positive associations are seen between the use of analgesics and outbreaks of influenza.”<sup>28</sup>

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<sup>19</sup> Kabuji P et al. 2005. “Increasing condom use without reducing HIV risk.” *JAIDS* 40(1): 77-82.

<sup>20</sup> Ibid.

<sup>21</sup> Simutami L. “The Making of a Male Condom,” Presentation on December 8, 2006. Washington, DC.

<sup>22</sup> Spruyt A and Steiner M et al. 1998. Identifying condom users at risk for breakage and slippage. *American Journal of Public Health*. 88(2):239-244.

<sup>23</sup> De Visser RO and Smith AMA. 2000. “When always isn’t enough: implications of the late application of condoms for the validity and reliability of self-reported condom use.” *AIDS Care*. 12(2):221-224.

<sup>24</sup> The study used prostate specific antigen (PSA), a sensitive biomarker found only in semen, to measure semen exposure.

<sup>25</sup> Walsh T and Frazier R et al. 2003. Because the study could not ethically require study participants to forgo condom use during the study, a baseline sample of semen (and thus PSA) from inside a condom after ejaculation.

<sup>26</sup> Website of the American College of Emergency Physicians.

<sup>27</sup> Evidence for HIV decline in Zimbabwe: a comprehensive review of the epidemiological data, UNAIDS, 2005.

<sup>28</sup> Dr. Andy Haines, Dean of the London School of Hygiene and Tropical Medicine, in an April 6, 2004 letter to Global AIDS Coordinator Randall Tobias.

## Are condoms effective in preventing sexually transmitted infections (STIs)?

- ❑ Research on condom effectiveness in preventing STIs other than HIV is less conclusive than the research on HIV prevention. The CDC, WHO, and NIH have called for more and better-designed studies to inform STI prevention.<sup>29</sup>
- ❑ While studies have shown varying levels of protection, evidence supports the assertion that correct and consistent condom use is highly effective in preventing *discharge STIs*, or STIs that are transmitted when vaginal fluid or semen from an individual with an STI comes into contact with mucosal surfaces of an uninfected sexual partner, including the male urethra and the female vagina or cervix. These diseases include gonorrhea, chlamydia<sup>30</sup> and trichomoniasis.<sup>31</sup>
- ❑ Condom use is less effective in preventing *genital ulcer diseases*, or those that are passed through contact with infected skin or mucosal surfaces. Since these surfaces may not be covered by a condom, its use is less effective in preventing these STIs, including genital herpes, syphilis, and chancroid. However, research suggests that the male condom offers partial protection against these diseases.<sup>32</sup>
- ❑ A recent longitudinal study of human papilloma virus (HPV) and condom use found that young women who used condoms for all instances of intercourse were 70% less likely to contract HPV than women who used condoms less than 5% of the time.<sup>33</sup>
- ❑ Another longitudinal study found women who used condoms every time they had sex had lower rates of prolonged HPV infection than inconsistent users,

which is associated with cervical neoplasia (precancerous cell growth).<sup>34</sup>

## Do condoms cause allergic reactions?

- ❑ While latex allergies can prevent individuals from using latex condoms, the population at risk of such allergies is estimated to be between .08%<sup>35</sup> and 3%.<sup>36</sup> For individuals with latex allergies, non-latex condoms can be used. While few studies exist, Walsh and Frezieres found slightly higher breakage rates with non-latex condoms but a non-significant difference in pregnancy rates between latex and non-latex condom users.<sup>37</sup> How do condoms fit into PSI's HIV prevention strategy?

Male condoms are the most effective technology available to prevent sexual transmission of HIV among sexually active individuals. As such, PSI strives to ensure access to high quality, affordable condoms for at-risk individuals around the world. Condom social marketing fits into a framework of evidence-based prevention programs that address the various and complex factors influencing HIV transmission. PSI addresses the epidemic on many fronts, including campaigns among youth intended to delay sexual debut, programs to encourage mutual fidelity or reduce concurrent partnerships, treatment and prevention of non-HIV STIs, programs addressing injecting drug use and campaigns to change harmful social norms encouraging unsafe sexual behavior. However, the power of the effective and relatively inexpensive male condom as a linchpin of HIV prevention cannot be underestimated.

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<sup>29</sup> Holmes K, Levine R, and Weaver M. 2004. "Effectiveness of condoms in preventing sexually transmitted infections." *Bulletin of the World Health Organizations*. 82(6):454-461.

<sup>30</sup> Niccolai LM and Rowhani-Rahbar A et al. 2007. "Condom effectiveness for prevention of Chlamydia trachomatis infection." *Sexually Transmitted Infections*. 81(4):323-325.

<sup>31</sup> CDC. 2000.

<sup>32</sup> Ibid.

<sup>33</sup> Winer R and Hughes J et al. 2006. "Condom use and the risk of genital human papillomavirus infection in young women." *New England Journal of Medicine*. 354(35):2645-2654.

<sup>34</sup> Shew M and Fortenberry D et al. 2006. "Association of condom use, sexual behaviors, and sexually transmitted infections with the duration of genital human papillomavirus infection among adolescent women." *Archive of Pediatric and Adolescent Medicine*. 160(2):151-6.

<sup>35</sup> World Health Organization. 2000. "Effectiveness of male latex condoms in protecting against pregnancy and sexually transmitted infections." *Fact Sheet No. 243*.

<sup>36</sup> Walsh T and Frezieres R et al. 2003. "Evaluation of the efficacy of a nonlatex condom: results from a randomized controlled trial." *Perspectives on Sexual and Reproductive Health*. 35(2):79-86.

<sup>37</sup> Ibid.