

Condoms for the prevention of HIV transmission: cultural dimensions

Malcolm Potts and Roger V. Short

AIDS 1989, 3 (suppl 1):S259-S263

Keywords: Condoms, HIV, culture, promotion, supply.

Introduction

We can learn much about the probable effectiveness and future potential of condoms for stemming the spread of HIV infection by looking back to see how condoms have performed in family planning programs around the world. It is somewhat ironical that condoms were first developed as a defense against sexually transmitted disease. Syphilis was apparently imported into Europe from the New World by Christopher Columbus' returning fleet at the end of the 15th century, and was soon causing alarm throughout Europe. Gabriel Fallopio, the great Italian anatomist who was to give his name to the Fallopiian tubes, wrote a treatise on the subject, *De morbo gallico*, which was published posthumously in 1564, and which contains the first account of a condom. It was made from a linen sheath that fitted around the glans penis as a protection against the dreaded 'Great Pox' (to distinguish it from small pox). It was only some time later that the contraceptive potential of condoms began to be appreciated, and people started to use impervious natural membranes, like the ideally proportioned blind-ending cecum of the sheep. Casanova was a great advocate of condoms, although presumably more for self-protection than out of any concern for the reproductive health of his numerous conquests [1]. Another male defense against sexually transmitted diseases has been to take refuge in female virginity — to have intercourse with somebody *virgo intacta* is perceived to be a promiscuous man's best guarantee of safety, and sadly it is a practice that is reappearing in response to the threat of AIDS.

Our anatomy and cross cultural studies of human sexual behavior provide compelling evidence that we are indeed polygamous primates [2]. Most men have more than one sexual partner in a lifetime, and the average man is likely to have more partners than the average woman — with female prostitutes balancing out the equation. The acquisition and transmission of HIV infection is also closely related to the number of lifetime sexual partners. Globally, the most important route of HIV transmission is by sexual intercourse of some kind. In the Third World, heterosexual transmission is overwhelmingly the most common mode of spread, whereas in developed countries, homosexual transmission was the most frequent form of trans-

mission at the beginning of the epidemic, and remains a significant route today.

It is not difficult to find evidence from contemporary cultures in developing and developed countries to illustrate the polygamous nature of human sexual relationships. For example, a recent study [3] of 1063 monogamously married working men and 1084 monogamously married working women in Kinshasa, Zaire, showed that 35% of the men and 2% of the women had had extramarital sex in the previous year, and condom use was low and infrequent in such relationships. Among 290 women seeking an abortion in Devon, England, the mean number of sexual partners by age 20 was over four [4]. In a study of sex partner change in the USA, 3% of men aged 18-29 and 0.9% of those aged 30-44 reported 10 or more sex partners in the past 12 months [5]. In Santa Domingo, Dominican Republic, one out of five men (18-27 years) had their first intercourse with a prostitute and six out of 10 reported being unfaithful to their steady partner [6]. A recent study found half (43 out of 92) unmarried girls in a survey of rural Indian women had had sexual intercourse [7].

The condom

The name 'condom' has been attributed to a certain Dr Condom, reputedly a physician at the court of Charles I who was alarmed by the illegitimate offspring sired by that restoration monarch. More likely, it is derived from the Latin *condus* a receptacle. The earliest rubber condoms were made from sheets of rubber, and the finished product carried a seam along its entire length. Hand-dipping over glass formers began in the late 19th century, and the continuous production process, in which formers are dipped in latex and then cured, dates from the 1930s [1,8]. Electronic testing of individual devices was introduced in 1951, silicon lubricants in the 1960s, and spermicidally lubricated condoms were first tested in 1975 [9]. Japanese manufacturers pioneered colored condoms. Samples of manufacturing batches of condoms can be tested in a variety of ways, and studies demonstrate that the shelf life of latex condoms, particularly when stored in hot, humid conditions is poor [10]. Family Health International is exper-

From the Family Health International, Research Triangle Park, NC, USA.

Requests for reprints to: Malcolm Potts, Family Health International, PO Box 13950, Research Triangle Park, NC 27709, USA.

imenting with plastic condoms. Laboratory tests demonstrate that HIV and other viruses of comparable size will not penetrate latex condoms [11,12], although the data on sheep cezum are equivocal [13]. The US Food and Drug Administration permits condoms sold in the USA to be labeled 'for prevention of sexually transmitted diseases, including...AIDS'.

The fact that condoms are so obviously phallic in shape and intercourse-related has engendered a sense of prudishness about them in most societies, and it has not helped to have them associated with preventing the spread of sexually transmitted diseases acquired during illicit extramarital relationships. Family planners have sought to dissociate the condom from sexually transmitted disease control and advocate it as a legitimate contraceptive, free of any known harmful side effects. They have been hampered in their advocacy by its low contraceptive use-effectiveness in certain populations. For example, the most recent report from the Oxford Family Planning Association study of 17 000 married women recruited during 1968-1974 when aged 25-39 shows failure rates ranging from as low as 0.6 per 100 woman-years of use for non-smoking, low-parity women aged 40-44 who had used condoms for more than 4 years, rising to a failure rate of 14.7 per 100 woman-years for currently smoking, high-parity women aged 25-34 who had not used the condom for more than 2 years [14]. Since smoking is generally associated with risk-taking in other contexts, we can assume that these differences between age groups are likely to reflect user rather than method failure.

Unfortunately, we simply do not know the contraceptive efficacy of condoms when used correctly all the time. There have been no carefully designed, well-analyzed studies such as exist for pills or intrauterine devices. The studies that do exist indicated failure rates of between 1-22 per 100 woman years of exposure [8]. Fourteen percent of US married women and 11% of single women had an unplanned pregnancy within 1 year of starting to use condoms [15]. Many people may only use condoms around mid-cycle, when they think that the woman is likely to be ovulating. The condom may be put on too late, after some penetrative intercourse has occurred, although there are unlikely to be sufficient sperm in this pre-ejaculatory fluid to result in a pregnancy. The condom may tear during use, especially if an inappropriate lubricant like petroleum jelly is used, or if it has been stored under sub-optimal conditions. In a study of used condoms from hotel and motel rooms in Santa Domingo, 3% were torn and 4% were open but not used [16]. The condom may have a hole in it due to faulty manufacture. It may fall off in the vagina during penile detumescence, allowing leakage of sperm. Hopefully, the addition of a spermicide like nonoxynol-9 to the condom should provide additional protection against some of these user- and method-failures, but there is no evidence *in vivo* to prove the point, and it would require a very large clinical trial to demonstrate any additional protection; more modern forms of foil packaging, by protecting the latex from the deteriorating effects of sunlight, moisture and ozone, should increase the shelf-life of condoms.

Skeptics will always turn to the worst use-effectiveness figures and say that condoms, on their own, are not reliable enough to be promoted as contraceptives, especially

for teenagers. And, if there is a 14.7% failure rate of condoms as contraceptives over one year, when they only need to prevent sperm passage for about 5 days a month, or 60 days a year, might we not expect much higher failure rates in HIV prevention, when the condom will have to work 365 days a year, and exclude a viral particle that is many orders of magnitude smaller than a spermatozoon? If a condom fails as a contraceptive, an unwanted pregnancy can be terminated, but if it fails to prevent HIV transmission, there is no cure. Such uncertainties can easily undermine condom promotion campaigns and must be assured by education.

The infectivity of HIV in vaginal/penile intercourse is low (Fig. 1), at least when the penis and vaginal tissues are free of other bacterial or viral infections. However, the duration of potential exposure is unusually long for this infectious disease. The risk of transmission at unprotected anal intercourse appears to be considerably higher, and HIV infection in homosexual communities is spread with great rapidity. The available data on condoms interrupting the spread of sexually transmitted diseases, and of HIV in particular, is limited, but nearly all studies indicated a genuine protective effect [17,18]. Beneficial effects have been reported in prostitutes [19,20] and in heterosexual married couples [21]. In Bonn, West Germany, 127 HIV-negative wives of HIV-positive haemophiliacs who used condoms regularly failed to seroconvert [22]. In Zaire, 122 HIV discordant couples who used condoms regularly showed only three seroconversions in an 8-month observation period [23].

Present use

There has been some increase in condom usage in some countries in response to AIDS. In the USA, following the Surgeon-General's advocacy of condoms, sales increased 20.3% from 1986 to 1987. Spermicidally lubricated latex condoms doubled their sales during this period, whereas the sale of natural membrane skin condoms declined [24]. However, the prevalence of condom use in the USA or UK today remains lower than it was a generation ago [1].

If we look at global figures for condom use in contraception, there are some interesting lessons to be learned. Mauldin and Segal [25] have shown that the world's highest rate of condom usage is in Japan, where it is by far the single most popular contraceptive; in 1986 condoms were used by 45% of all contracepting couples. There seem to be several reasons for this: the oral contraceptive pill and injectable steroids are not approved for contraceptive use in Japan, and intrauterine devices are unpopular and voluntary sterilization rarely used. Japanese couples are therefore forced back on condoms, periodic abstinence, or abortion, and it has been said that the high abortion rate is a reflection of this heavy reliance on condoms for contraception [26]. Japan, like many European countries, seems to have a tradition of condom acceptance dating back to the war years, when all members of the armed forces serving overseas were issued with condoms. Japanese condom manufacturers have developed an excellent product that is most attractively packaged, and it seems significant that a high proportion of condom sales are made by door-to-door saleswomen who sell to housewives.

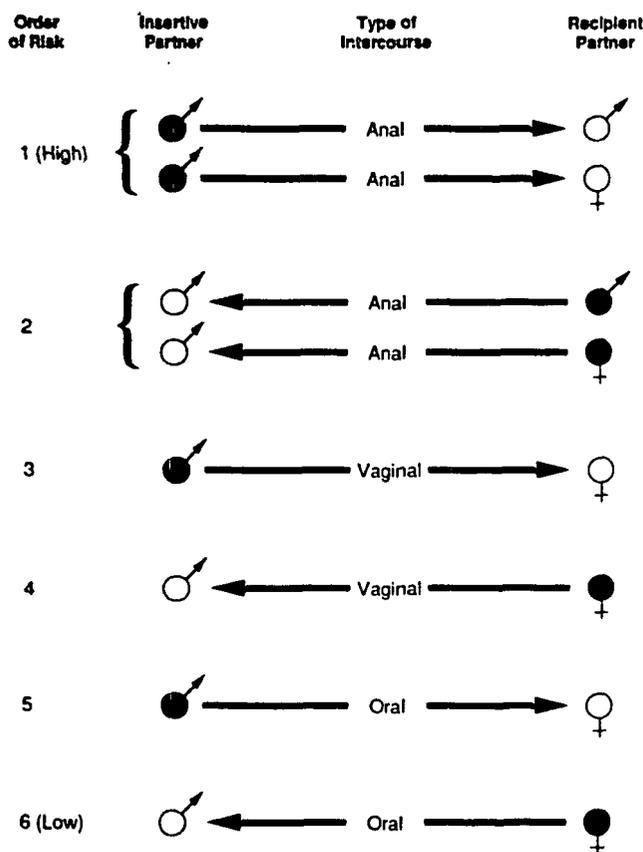


Fig. 1. Order of risk for uninfected partner (open circle) on having intercourse with infected partner (solid circle). The presence of genital lesions will further increase the infectivity and susceptibility to infection of either partner.

Other countries with high condom usage rates for contraception include Sweden (1981; 25%), Finland (1977; 32%), Denmark (1975; 25%). Singapore (1983; 24%) and Trinidad and Tobago (1987; 12%) [25]. Sweden mounted a most successful and amusing condom advertising campaign in the 1960s and 1970s and the condom is now taking the place of the pill as people become increasingly concerned about possible health risks of oral contraceptives. This increase in condom use has also been paralleled by an impressive decline in the incidence of sexually transmitted diseases [27]. By contrast, condom usage is extremely low throughout most of Africa, Asia and South America.

Future use

The prime reason for the low prevalence of condom use in most parts of the world, including those with the highest burden of HIV, is almost certainly lack of availability of condoms and inadequate promotion, although there may also be important differences in the level of cultural acceptance that still need to be explored. Whenever possible, condoms should be promoted amongst women as well as men, maybe using separate channels of distribution, different packaging, and different logos.

As women make a much greater investment in reproduction than men, it would not be surprising if they responded to different types of promotion. There is evidence that in

the case of AIDS, a threatening message such as 'you will die unless you use a condom' will promote condom use by women, whereas it may encourage men to indulge in risk-taking behavior [6].

Social marketing programs use the skills of commercial advertising combined with carefully selected brand images. They exploit existing retail channels to distribute condoms, can be cost-effective, are socially sensitive and acceptable and can reach even the remotest villages of poor countries rapidly. Perhaps the most successful of these programs is that run by Population Services International (PSI) in Bangladesh [28]. In a conservative Moslem environment with a low literacy rate and a largely subsistence economy, and where women are largely confined to the home, condoms are sold in over 100 000 outlets reaching every corner of the country. In Zaire, PSI also mounted a condom sociomarketing campaign. In the first month, sales were 19 000 items; this had increased to 300 000 by the tenth month [29]. Thus, with the right type of promotional campaigns, condom usage rates can be significantly and rapidly increased, even in countries where current usage is very low; this is doubly true if efforts are focused on target groups at high risk of HIV transmission. One small but highly influential group of people who can provide leadership for the rest of the community are medical students [30]. The vivid promotion of condoms in Sweden and in Thailand where the name of one charismatic individual, Mechai Viravaidya, has become synonymous with condom in the Thai language, suggests that humor can play a role in condom promotion in some cultures.

In Africa, it seems likely that the high heterosexual rate of HIV transmission is due at least in part to the high incidence of other sexually transmitted diseases. These may reach alarming proportions in some regions; in Gabon, West Africa, it is reported that 32% of women may suffer from primary infertility, almost entirely as a result of blocked Fallopian tubes produced by a variety of sexually transmitted diseases [31]. Increased condom use in such regions might yield a triple benefit; not only could condoms prevent HIV spread directly, but by decreasing the incidence of other sexually transmitted diseases they might significantly lower the individual's HIV infectivity and susceptibility to infection, while at the same time increasing the potential fertility of the female population.

But here we encounter a major obstacle: can we afford to promote increased condom use in Africa? This may sound like a cynical question, but Kangas *et al.* [32] have pointed out that the US Agency for International Development, which is the world's largest condom supplier, shipped 120 million condoms in 1987, 48% to Africa. But if all 120 million had been sent solely to one African country, Nigeria, they would have provided for the needs of less than 6% of the estimated 22 million men aged between 15-49, and so could only have had a minimal impact on the spread of HIV infection [32]. If we are to make condom intervention strategies effective, they *must* be targeted to high-risk groups where the impact will be greatest.

Currently available high-quality condoms from Western manufacturers purchased in bulk, cost about four cents an item. Recently, Korean manufacturers have offered condoms for approximately three cents. In any case, assuming about two to four acts of intercourse per week, this works

out at between 100 and 200 condoms per sexually active male per year, or US \$3–8 per year.

In 1985, there were 125 million men aged 15–49 living in Africa. Thus up to one billion dollars a year would be necessary from donor agencies to meet the need for condoms. It is difficult to think of a technology much simpler and cheaper than a condom — and yet ironically it is a technology we may not be able to afford. And then there is the question of manufacturing capacity. The world's rubber trees can produce adequate amounts of latex to meet perceived future condom demands — much of the latex is currently used for things like rubber backing on carpets and could be diverted into condom manufacture should the need arise, although the demand for surgical gloves (also partly driven by AIDS pandemic) is a direct competitor with condoms for high-quality latex. If disposable latex condoms are a luxury that is beyond our means, then one alternative might be to look again at reusable condoms. In Britain, until the late 1960s, reusable condoms made out of thicker rubber had a small part of the total market. Reusable rubber (or possibly plastic) condoms would simplify the logistics of condom distribution in Third World countries and would overcome the hurdle of the relatively high cost of the disposable product for poor Third World societies.

Policy Issues

For HIV infection to become a self-sustaining epidemic, it must have a reproductive rate of more than one: that is, one infected individual must infect more than one other individual before succumbing to the disease. In industrialized nations, moderate changes in behavior and a significant but by no means unachievable increase in condom use, would have a high probability of reducing the reproductive rate of the disease to less than one. The cost of the condom would be met by the consumer, although the state might want to invest in promotion. In the absence of these changes, HIV will remain a serious problem amongst homosexuals and will also give rise to a more slowly spreading heterosexual epidemic. But if changes could be implemented, heterosexual spread might remain confined to clusters of women who have been infected by male intravenous drug users or bisexual men, without giving rise to a self-sustaining epidemic in the general heterosexual population.

In the Third World the problem is an order of magnitude more difficult. There is neither the manufacturing capacity nor, more importantly, sufficient money available in Third World countries (or in international health programs) to finance a rapid increase in condom prevalence worldwide, even if it could be achieved. Important management decisions must be made to focus the limited resources that are available into areas of greatest need and greatest impact.

The logistic problems and costs of making condoms available nationwide is going to be considerable, and those

managing the national and global programs on AIDS prevention must understand that these programs will consume large amounts of money. Manufacturing capacity can be increased, although bulk orders may require a year's lead time or more. Third World production is already cost-effective in some large countries (e.g. India and China), but in many places a policy of blindly promoting local production could raise prices and hazard quality.

AIDS is still a new disease and in many parts of the world remains largely confined to high-risk groups such as prostitutes, homosexual men and others with multiple partners, so condom supplies can and must be focused on these groups where possible. Therefore, we do not have to achieve the impossible by increasing condom use worldwide, or even throughout Africa. In a few places, such as Uganda where HIV is well established in rural areas [33], the prevalence of HIV demands nationwide education and condom provision. There are ways of increasing condom distribution and usage, but they will have to be developed in partnership with, not through, ministries of health. We have more than 15 years of experience in social marketing of condoms for family planning purposes in a variety of cultures. Social marketing depends on existing skills: the retail outlets (and often the wholesale distribution systems) are already there, whether it be in shops, petrol stations, brothels, vending machines or other places, and even the poorest countries nearly always have the commercial advertizing skills to develop the necessary promotional messages. The non-governmental sector (both voluntary and for profit) is going to have to carry the larger part of the burden of condom distribution in nearly all countries.

Fortunately, there is some hope for the future; the need for more effective interventions to control AIDS, and the need for a vast expansion in family planning services in the next 10 years partly overlap and can be mutually supportive. Funding for family planning will have to rise from hundreds of millions of dollars a year to billions. In areas where the prevalence of HIV infection is high, the spectrum of contraceptive use will probably change in favour of condoms. Family planning education and service programs could also help to control sexually transmitted diseases and HIV infection. For example, different brands of the same condom could be developed for family planning and AIDS control, but common skills and logistic services used in their distribution.

The challenge we face is to develop an integrated approach to the three great problems that face us at the end of the 20th century — family planning, HIV prevention, and sexually transmitted disease control. Condoms hold the key to all three, and underline their interrelatedness. The immediate task is to increase condom availability in areas where the needs are greatest. This, coupled with stronger promotional campaigns, will highlight cultural differences in condom acceptability which need to be taken into account as the programs develop.

If we fail in this endeavor, the Alma Ata Declaration of 'Health for all by the year 2000' will be a vanishing dream,

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