# Failure Rates of Male and Female Condoms Fall with Use

Male and female condoms have fairly low rates of slippage or breakage, and such failure declines as users' experience with the method grows, according to findings from a large observational study of women attending two STI clinics in the southern United States in 1995–1998.[1] For example, 3% of all female condoms slipped out of the woman's vagina; the rate was 11% at first use, but it fell steadily to less than 1% if the method had been used 15 times or more. Similarly, 3% of male condoms broke during use—7% among first-time users, compared with 2% among those who had used male condoms 15 times or more. Multivariate analyses confirmed the association suggested by these rates.

To be eligible for the study, women had to be aged 18–35 and not pregnant or planning to become pregnant within the next six months. At their first study visit, participants completed an interview and received instruction on recording their sexual activity and condom use on a diary form. They then watched a videotape providing instruction on condom use, attended a skills-oriented counseling session and were offered an opportunity to practice inserting the female condom under a nurse clinician's guidance. Women received a supply of either male condoms or female condoms with male condoms as a backup. They were asked to return for six follow-up visits at four-week intervals. At each visit, women returned their sexual diary, answered questions about their sexual and contraceptive behavior in the previous 30 days, attended an individual counseling session and received a new supply of condoms.

The analyses were based on 869 women who used at least one condom during follow-up. The majority of these women were black and low-income; their median age was 24, and their median number of years of schooling was 12. Three in five women had used male condoms in the 30 days before entering the study, but only one in four had used them every time they had intercourse. Three women had ever used a female condom, and 95% practiced inserting the device at the clinic.

During the study period, the women used 7,895 female condoms and 12,253 male condoms. In all, 0.1% of female condoms broke, and 6% slipped (in 3% of cases, the condom slipped out of the vagina; in 3%, the outer ring of the device slipped in). Three percent of male condoms broke, and 1% slipped off the penis. The researchers used logistic regression to assess factors associated with condom failure, controlling for a range of user characteristics measured at baseline and over time.

Compared with women who were 30 or older when they entered the study, younger age-groups had higher odds of having a female condom slip out (odds ratios, 2.1–2.6), but not of having the device slip in. Other baseline characteristics (e.g., education, lifetime number of partners and STI history) were not significantly associated with the likelihood of slippage.

Factors measured over time showed a number of associations with slippage of the female condom. Notably, the rates of slipping out and slipping in were substantially above average at first use (11% and 8%, respectively) but fell precipitously thereafter; for women who had used the female condom 15 or more times, both rates were less than 1%. Likewise, in the regression analyses, the odds of slippage were significantly elevated for first-time users compared with those who had used the device 15 or more times (odds ratios, 18.5 for slipping out and 19.7 for slipping in). Previous slippage of a female condom also was associated with increased odds of both kinds of slippage (2.7–2.8). In addition, having more than one sexual partner was associated only with an elevated likelihood of having a female condom slip out (1.5); having a casual partner and having had other problems with a female condom, only with an increased risk of the device's slipping in (2.0 and 2.3, respectively). Women who had had a female condom break were at increased risk of having one slip out (3.7); this factor was not examined with respect to slipping in.

Women's baseline characteristics had more associations with male condom failure than with female condom failure. Those who were younger than 20 were at risk of experiencing breakage (odds ratio, 1.9). Married women had increased odds of reporting slippage (1.9), as did those who had had a large number of partners (2.0 both for women reporting 6–7 partners and for those reporting 13 or more). Participants reporting alcohol or drug use in the past 30 days had a reduced likelihood of having a male condom slip (0.6).

Again, some of the most striking differences in failure rates were linked to experience with the method: The male condom breakage rate fell from 7% among first-time users to 2% among those who had used the method at least 15 times; the slippage rate dropped from 3% to 0.4%. In the regression analyses, the odds of breakage and slippage were significantly higher among first-time users than among those with the most experience (odds ratios, 6.0 and 7.9, respectively). Women who had had a condom break in the past were at increased risk of experiencing another breakage (3.6), and those who had had a male condom slip had elevated odds of repeating that experience (8.3). Other problems with male condoms and prior breakage of a female condom also were associated with an increased risk of slippage (2.8 and 3.1, respectively).

The researchers acknowledge three potential limitations of their study: The trial was not randomized, attrition was high and because participants received intensive instruction about the methods, they may have experienced lower failure rates than would typically be the case. However, the investigators contend that the study's strengths—its large size, short recall periods and multiple data collection methods—more than make up for these weaknesses.

In conclusion, the researchers note that "either condom used correctly should provide protection" against STIs. Nevertheless, they caution that for some individuals at high risk of acquiring an STI, condom failure rates may be "unacceptably high," and health care providers should consider counseling such individuals to abstain from vaginal intercourse.
*–D. Hollander*

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## Childhood Stunting Is Linked to the Pregnancy Intentions of Both Parents

In Bolivia, 12–35-month-old children whose mothers say their conception was unwanted or mistimed have a 30% higher risk of stunted growth than do those whose conception was intended.[1] Data from the 1998 Demographic and Health Survey (DHS) also show that children in this age-group whose conception was reported as mistimed by both parents have a higher risk of stunting than do children whose conception was reported as intended by both parents (risk ratio, 3.8).

The DHS was conducted among a representative sample of 15–49-year-old women; it collected information on respondents' demographic characteristics, reproductive history, use of contraceptives and maternal health services, and lastborn child's height and age. In addition, women and their male partners were asked whether their last child had been wanted at the time of conception (intended), later (mistimed) or not at all (unwanted). Researchers calculated the prevalence of childhood stunting, which they defined as height-for-age more than two standard deviations below the 1978 reference median. They conducted bivariate and multivariate analyses to examine how stunting related to mothers' pregnancy intentions and to the combined intentions of both parents. Samples for analysis comprised 3,126 singleton children younger than 36 months, including 732 for whom paternal data were available.

Sixty-five percent of children were toddlers (aged 12–35 months) and the remainder were infants. They were roughly evenly distributed with respect to birth order, and most had been born 2–4 years after their next older sibling. The majority had been born to women who were married, were younger than 30 and had no more than a primary education. Substantial proportions had mothers who had not used contraceptives before the pregnancy (66%) or received maternal health services during pregnancy or delivery (22%). The majority (69%) lived in households with a piped water source, but 78% lacked a flush toilet. Fifty-nine percent lived in urban areas, and 41% in the high-elevation Altiplano region.

According to mothers' reports, 46% of children had been intended at conception, 33% had been unwanted, and 21% had been mistimed. According to fathers' reports, these proportions were 23% and 16%, respectively.

Overall, 22% of children were stunted. Stunting was more common among children whose conception had been unwanted by their mothers than among those whose conception had been intended (29% vs. 19%). Those proportions were 37% vs. 18%, respectively, when fathers' reports were used. The prevalence of stunting was higher among toddlers (25–32%) than among infants (11%), among children born to contraceptive nonusers (26%) than among those born to users of modern methods (14%), and among children whose mothers had not used maternal health services both during pregnancy and at delivery (28–36%) than among those whose mothers had used maternal services at both points (14%). The prevalence of stunting rose with mother's age and child's birth order, and tended to decrease as mother's educational level and last pregnancy interval increased. It was higher among children living in poor conditions, rural areas and the Altiplano region (20–38%) than among children in more favorable environments (9–18%). These factors were all associated with childhood stunting at the bivariate level.

These patterns persisted in more detailed analyses stratified by mothers' pregnancy intentions. For all variables, stunting was more common among children born as the result of unwanted pregnancies than among those whose conception had been intended. Moreover, the link between stunting and unwanted pregnancy was stronger among toddlers than among infants (risk ratios, 1.7 and 1.5, respectively). The prevalence among children whose conception had been mistimed tended to fall between those for the other two groups; however, the relationship between mistimed status and stunting was rarely significant.

Multivariate analyses indicated that toddlers had a 30% higher risk of stunting if their mothers reported that their conception had been unwanted or mistimed rather than intended (risk ratio, 1.3 for each). In addition, the risk of stunting was significantly higher among toddlers whose conception had been reported as mistimed by both parents than among those whose conception had been reported as intended by both parents (3.8).

The researchers acknowledge the limitations of cross-sectional data and retrospective reports of pregnancy intentions. They suggest that "the lack of a significant association [between mothers' intentions and stunting] in infants may be due to the protective effect of breastfeeding." The researchers note that improving policies and programs aimed at "reducing unwanted and mistimed pregnancies in Bolivia may decrease the prevalence of stunting in children." Moreover, they say, "children born to parents reporting unintended pregnancies should be monitored for stunting and interventions should be in place to prevent stunting."*–R. MacLean*

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## Doorstep Delivery Increases Adoption of Contraceptives In Rural Areas of Pakistan

In rural Pakistan, married women living in a household served by a community-based health worker are more likely than other married women to currently use a modern reversible contraceptive.[1] Data from a national evaluation of the community-based Lady Health Worker Program indicate that women in rural areas served by the program had 50% higher odds of using such a method, compared with women in control areas. Women in program areas were also more likely to have ever used such a method.

The program, formally known as the National Program of Family Planning and Primary Health Care, uses trained employees called lady health workers to provide doorstep delivery of services, including basic preventive care and contraceptive supplies and referrals. Each lady health worker serves approximately 1,000 persons in her own community.

To evaluate the impact of the program on adoption of modern reversible methods, researchers interviewed a random sample of women living in households served by a lady health worker for at least four years as well as a randomly selected comparison group of women living in nonserved communities. Survey participants were asked what method of family planning, if any, they used and whether they had ever used a modern reversible method. Women responding affirmatively to

the latter question were also asked when, approximately, they had initially begun use of a modern method. The survey, conducted between October 2000 and April 2001, covered all provinces and federally administered areas of the country. The investigators used weighted, nationally representative data in their analysis, which they restricted to married women living in rural areas.

In general, households in the served communities were better off socioeconomically than those in the control areas, and women had more autonomy. For example, according to data collected from various sources, served communities had a higher proportion of households with a toilet (55% vs. 33%), a higher prevalence of adult female literacy (27% vs. 14%) and a higher proportion of women permitted to visit a health facility outside their village alone (41% vs. 30%). However, the proportion of adult women in the two areas having any radio exposure was the same (34%).

Among respondents aged 23–48 years and married for at least eight years at the time of the survey, the increase in ever-use of modern reversible contraceptives from before the program's implementation to the time of the survey was considerably greater in the group served by the program than in the control group. Among served women, the proportion of ever-users increased from 9% in 1993 to 40% in 2000–2001, compared with 9% to 28% among controls (a difference of 12 percentage points).

A higher proportion of served women than of controls reported current use of any method (30% vs. 21%) and of a modern method (20% vs. 14%); for both measures, the control group averages are similar to previously reported national estimates for 2000–2001 (22% and 15%, respectively). Thirteen percent of the women in the program areas and 7% of controls were currently using a reversible modern method. Two percent and 0.2%, respectively, were pill users; 3% and 1% injectable users; and 4% and 2% IUD users.

The researchers performed logistic regression analyses limited to women with at least one child. After adjustment for numerous characteristics, including socioeconomic variables, women in the program areas were significantly more likely than women in the control group to currently use a modern reversible method (adjusted odds ratio, 1.5). Other characteristics positively associated with women's current use included being educated; having at least two living children; wanting to have no more children; watching television frequently instead of rarely or never; and living in a house with floors made of cement or tiles rather than mud, brick or earth. In contrast, living more than 2 km from the nearest store and residing in Sindh Province instead of Punjab were each associated with decreased odds of use.

The investigators acknowledge that the socioeconomic differences between the program and control areas pose an important study limitation. However, they comment that their analysis nonetheless shows that the Lady Health Worker Program has "succeeded in integrating family planning into the doorstep provision of preventive health care and in increasing the use of modern reversible methods in rural areas." The authors also state, "In Pakistan, where women's mobility is severely limited and female modesty highly valued, the provision of doorstep services through community-based female workers appears to be one model of service delivery that will help to achieve universal access to family planning by 2010"—a primary goal of the government's current population policy.—*C. Coren*

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## In Mexico, Hysterectomy Is Often Used as Treatment For Cervical Abnormalities

In Mexico, most physicians know that human papillomavirus (HPV) is the principal cause of cervical cancer and that screening should begin after first intercourse. However, according to data from 1,206 obstetrician-gynecologists and general practitioners, many mistakenly use hysterectomy to treat low-grade abnormal cell growth on the cervix.[1] Although obstetrician-gynecologists tend to be better informed than general practitioners, more than 60% of both groups incorrectly believe that cancer-causing strains of HPV also cause genital warts. Nearly all physicians support educating women about HPV's link to cervical cancer, but the majority agree that this information could cause problems within partnerships.

Data were collected in 2002 at a random sample of 288 public and private health care facilities located in urban areas. At each site, four physicians were nonrandomly selected to complete a self-administered questionnaire; respondents provided information about their background characteristics, knowledge and practices related to cervical cancer screening and treatment, knowledge of HPV and attitudes toward counseling. Researchers conducted chi-square tests to identify significant differences between obstetrician-gynecologists and general practitioners.

Seventy-five percent of respondents were nonspecialists. Overall, 69% were male, 42% were aged 45 or older, and 65% were from the central region. Forty-eight percent earned a bimonthly salary of US$337–865, and 86% were Catholic. Almost all (93%) had been trained at a public university; 40% worked in the private sector only, 33% in the public sector only and 27% in both. Most (86%) had performed a Pap smear in the last two weeks.

Overall, 83% of respondents had read or been informed about Mexico's official norms (Ministry of Health clinical practice guidelines) for the diagnosis and treatment of cervical cancer. Although these norms do not specify when women should get their first Pap smear, 77% of respondents thought screening should commence after first intercourse, regardless of age. However, 9% cited first childbirth, thus overlooking HPV risk between first sex and motherhood. The majority (73%) correctly stated that women should wait one year after a normal Pap test to repeat the process, but 16% incorrectly indicated a waiting period of six months.

Bivariate analyses revealed that obstetrician-gynecologists identified first sex as a starting point for screening in significantly higher proportions than did nonspecialists (81% vs. 76%). Contrary to official recommendations, 37% of obstetrician-gynecologists and 25% of general practitioners considered hysterectomy an appropriate treatment for mild or moderate cervical dysplasia—a statistically significant difference. The proportions who correctly cited electrosurgery, laser therapy and cryotherapy as recommended treatments were also higher among obstetrician-gynecologists than among general practitioners (55–73% vs. 32–52%). Use of hysterectomy in the past year to treat mild or moderate dysplasia was reported significantly more frequently by specialists than by nonspecialists (43% vs. 18%), as was use of the recommended procedures (23–52% vs. 11–15%). In addition, significantly higher proportions of physicians working in the private sector than of those work-

ing in other settings identified hysterectomy as a treatment option (34% vs. 21–27%) and had used the procedure in the past year (30% vs. 13–27%).

Overall, 80% of respondents correctly identified HPV as the principal cause of cervical cancer; 96% were aware of the link between this cancer and HPV; and 84% had heard about cancer-causing strains of the virus. Still, 61% incorrectly stated that these strains also cause genital warts. Almost all respondents believed that women should be informed that HPV causes cervical cancer. However, roughly one-third felt that providing this information could create unnecessary anxiety and confusion, and two-thirds thought it could cause problems within partnerships. About one-quarter believed the information would discourage women from seeking a Pap test.

A significantly lower proportion of obstetrician-gynecologists than of general practitioners incorrectly identified a family history of cervical cancer as the primary cause of this illness (7% vs. 17%). Moreover, a significantly higher proportion of obstetrician-gynecologists than of general practitioners had heard about cancer-causing strains of HPV (96% vs. 80%), and a significantly lower proportion said they did not know whether these strains also cause genital warts (10% vs. 24%). A significantly higher proportion of obstetrician-gynecologists than of general practitioners felt that informing women of the link between HPV and cervical cancer would cause unnecessary anxiety (37% vs. 28%). Concerns about the effects of counseling were generally more common among respondents in the north than among those in the central and southern regions.

The researchers acknowledge that respondents were not randomly selected within each facility and that results may not be generalizable to rural areas. They conclude that "appropriate dysplasia management is a priority area for provider education" and that given physicians' widespread agreement that women should be educated about the link between HPV and cervical cancer, "providers need to be armed with accurate information to share with women and their partners, as well as an awareness of and sensitivity to the implications this information carries."–*R. MacLean*

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## For Poor Brazilian Males, Sex Tends to Begin Early And Is Often Unprotected

Males growing up in shantytowns of Recife, Brazil, often begin having intercourse at very young ages, generally without using condoms.[1] Half of sexually experienced 13–19-year-olds participating in a 2000 survey had first had sex by age 15; only three in 10 had used a condom at first intercourse. The proportion who had used a condom was particularly low—28%—among respondents younger than 15. In multivariate analyses, factors reflecting parents' presence and their involvement in teenagers' lives were associated with postponing first intercourse and using a condom at that event.

The survey was conducted among unmarried teenage males in two of the poorest areas of Recife; a total of 1,425 youth participated. Fifty-two percent of respondents classified themselves as mixed-race; most of the rest were white (28%) or black (17%). Some 54% said they were Catholic, 15% reported some other religion and 31% no religious affiliation. The majority had completed more than four years of schooling. On the basis of the number of household assets and amenities the young men reported, 15% were classified as having a very low household living standard, 66% medium-low and 19% medium.

Slightly fewer than half of the teenagers lived with both parents; most of the rest lived with a single mother or with no parent or guardian. Sixty-four percent reported that they always needed their parents' or guardians' permission to go out at night, 30% that they sometimes did and 6% that they never did. Whereas 72% said that they could tell a young female any time they had feelings for her, 11% said that they could do so only some of the time and 17% said that they never could.

Fifty-four percent of those surveyed were sexually experienced; reported ages at sexual initiation ranged from nine to 17, and the median was 15. Twenty-four percent of sexually experienced respondents said that the first time they had had intercourse, both they and their partner had been younger than 15, and 29% said that both had been 15 or older; most of the rest had been younger than 15 and had had an older partner. In 69% of cases, a respondent's first partner had been an acquaintance or relative, and in 27% a girlfriend; 3% of sexually experienced teenagers had first had intercourse with a sex worker. Overall, 31% had used a condom at first sex; the proportion was 28% among respondents who were younger than 15 at the time of the survey and 38% among those who were 15 or older.

Results of logit regression analysis identified a number of characteristics that were significantly associated with the probability of early sexual initiation in this population. Youth who had a medium standard of living, those with more than four years of schooling and Catholics had higher probabilities of initiating intercourse before age 15 (42–46%) than did the poorest teenagers, those with less education and adherents of other religions, respectively (27–37%). Two findings suggest that parents may play a role in encouraging young males to delay intercourse: Teenagers living with a single mother or with no parent had greater probabilities of engaging in early intercourse (48% and 44%, respectively) than did those residing in two-parent households (35%); and teenagers who did not need their parents' permission to go out at night were more likely than others to initiate sex by age 15 (44% vs. 39%). Finally, youth who freely expressed their feelings to females were more likely than shy teenagers to begin their sexual lives early (44% vs. 27%). The researchers acknowledge, however, that the last two variables "may well be endogenous," and that the findings should be interpreted with caution.

Logistic regression analysis was used to identify factors significantly associated with the probability of condom use at first intercourse. Again, youth who required parental permission to go out at night had a reduced likelihood of engaging in risky behavior: The probability of condom use was 36% among these teenagers and 26% among their peers with more permissive parents. Degree of disadvantage also was a significant factor in this analysis; the least impoverished teenagers, who had a relatively high probability of engaging in early intercourse, had a greater probability than their poorest peers of using a condom at first sex (37% vs. 23%). The other key finding in this analysis pertained to the age of a youth and his partner: The probability of condom use was only 20% if both had been younger than 15, but it was 33% if the male had been younger than 15 and his partner had been older, and 38% if both had been at least 15 years of age. Additionally, the small proportion of respondents whose first partner had been a sex worker had a higher probability than those who had first had intercourse with a girl-

friend of using a condom (64% vs. 35%).

The researchers note that in the shantytowns of Recife, young people often lack adult supervision and positive adult role models. Although the task "is not a simple one," they recommend that reproductive health programs and media campaigns find ways to encourage parents' involvement with their children. More generally, they observe that "particularly strong" gender norms in Recife may encourage young males to engage in sexual activity, while logistical and cost factors may prevent teenagers from obtaining condoms. They urge the implementation of programs designed to enable male and female teenagers to "take control over their sexual lives in a responsible manner."–*D. Hollander*

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## Prepregnancy Health Status Has Strong Associations With Preterm Delivery Risk

A woman's risk of having a preterm delivery is influenced largely by conditions that occur during pregnancy, but a clinic-based longitudinal study in the western United States demonstrates that her health status and health behaviors prior to conception also may play a substantial role.[1] In analyses controlling for demographic characteristics and risk factors both before and during pregnancy, the odds of preterm delivery were nearly doubled for women whose level of physical function before conception was poor and for those who had chronic hypertension before becoming pregnant. Factors that predated pregnancy accounted for 40% of the variability in risk of preterm delivery.

The study cohort comprised women who received prenatal care at a site affiliated with one of six hospitals in the San Francisco Bay area of California. To be eligible, women had to be at least 18 years old at recruitment (between May 2001 and July 2002), had to have begun prenatal care before 16 weeks' gestation and had to be planning to deliver at one of the six hospitals.

Participants were asked to complete four telephone interviews: before 20 weeks' gestation, at 24–28 weeks, at 32–36 weeks and at 8–12 weeks after delivery. Each interview included questions from a standard instrument assessing physical, mental and emotional health, as well as screening for depressive symptoms. Questions in the baseline interview referred to the month before conception, and those in later interviews referred to the previous four weeks. The baseline interview also collected detailed information about participants' demographic characteristics and their medical conditions and health-related behaviors before pregnancy; subsequent interviews included questions about pregnancy complications. Additional data about the pregnancy and delivery were obtained from women's medical records.

The researchers restricted their analyses to the 1,619 women who had a singleton delivery at one of the participating hospitals. Most of these women were married or living with a partner, had been born in the United States and had given birth before. The cohort was racially, ethnically and socioeconomically diverse.

Eight percent of the women delivered preterm (i.e., at less than 37 weeks' gestation). Initial analyses suggested that a wide variety of factors were associated with the risk of this outcome; the researchers conducted a series of multivariate logistic regression analyses to determine which of these were independently associated with the odds of preterm delivery.

When only demographic characteristics were considered, the odds of preterm delivery were significantly elevated for black women (odds ratio, 1.9) and for women who completed high school but not college (1.7). With the addition of conditions and behaviors in the month before conception, demographic characteristics were no longer significant; the odds were elevated for women who had been underweight (2.4), those whose physical function had been poor (2.3), those who had suffered from chronic hypertension (3.1) and those who had smoked (2.2). In analyses that included pregnancy-related factors, most of these associations remained significant (the exception was being underweight), although the odds ratios were reduced. Pregnancy-associated hypertension and other complications were associated with increased odds of preterm birth (3.2 and 2.2, respectively). The researchers estimate that 13% of the variation in the risk of preterm delivery was attributable to demographic factors, 40% to conditions and behaviors that preceded pregnancy and 47% to factors occurring during pregnancy.

The researchers caution that the associations they found are not causal and relate only to factors that were present immediately before conception; both a woman's health status before pregnancy and her risk of delivering preterm may be associated with conditions that occurred earlier in her life. They conclude that "interventions and policies directed at improving access to care during pregnancy may fall short of the goal of reducing preterm delivery because they cannot address [a] legacy of poor health status and health behaviors." Reducing the incidence of preterm delivery, they maintain, "may require attention to the health status of women before pregnancy."–*D. Hollander*

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## Family Planning Clinics May Not Be the Best Option For Serving Pakistan's Poor

The opening of a family planning clinic offering subsidized services and outreach in each of four urban slum areas of Pakistan contributed to an increase in local married women's knowledge of any modern contraceptive method over an 18-month evaluation period, but it had no impact on overall use and mixed effects on unmet need.[1] Furthermore, although the clinics were intended to serve poor women, who often have many children and little access to services, they were used primarily by middle-income, low-parity women wishing to space births.

The clinics, opened in 1999–2000 by a major nongovernmental organization, were located in two communities in each of two provinces, Punjab and Sindh. To evaluate their impact after 18 months of operation, researchers compared selected outcomes in the clinic communities with those in a similar community in each province that had only the limited family planning services typical of poor urban areas. Using cluster and random sampling, they drew a sample of ever-married women aged 15–45 in each clinic and control community to participate in a baseline survey before the clinics opened and a second sample for an end line survey in 2001–2002. The interviewer-administered surveys covered women's socioeconomic characteristics; fertility; and contraceptive knowledge, use, needs and attitudes. Supplementary data were gathered in exit interviews with clinic clients at the time of the end line survey. In all, 5,338 women

completed baseline surveys, 5,502 end line surveys and 92 exit interviews.

Women who completed baseline surveys were typical of Pakistan's urban poor. Substantial minorities were younger than 30 (42%), illiterate (38%) and uneducated (40%); half had a standard of living classified as basic or low, and fewer than one in five were employed. On average, respondents had married at age 18 and had had four births. Three-quarters of the women reported that their husbands had gone to school, and virtually all said that their husbands were employed. Reported levels of approval of contraception were high—78% among the women themselves and 69% among their husbands.

At baseline, 88% of women in clinic communities could name at least one modern contraceptive method without being prompted; at end line, this proportion had increased by eight percentage points, to 96%. In the control communities, the level of knowledge also was high at baseline and had increased by end line; however, the absolute change was only three points, from 89% to 92%. Using logistic regression analyses that controlled for differences in women's characteristics between communities and over time, and for differences between the clinic and control communities, the researchers determined that the net effect—the five-point difference between clinic and control communities in the amount of absolute change—was statistically significant and thus may be interpreted as a result of the clinics' influence. The change was driven mainly by greater knowledge of female sterilization and the IUD. Modest increases were seen for the pill and injectable; however, no significant change occurred in knowledge of condoms or male sterilization.

Overall, the proportion of women reporting current use of a contraceptive increased from 30% to 36% between surveys in the clinic communities, and from 21% to 27% in the control communities. Both increases were statistically significant, but because the absolute changes were identical, no net effect can be attributed to the clinics. However, in analyses of specific methods, the clinics appear to have contributed to a decline in condom use and an increase in reliance on female sterilization.

Findings regarding the clinics' impact on unmet need show no consistent pattern. In the two Punjab communities, about half of women had an unmet need for contraception before the clinics opened. The proportion fell by 14 percentage points in one community and by 10 points in the other; results of logistic regression analysis that controlled for respondents' characteristics show these declines to be statistically significant. In both communities, the change resulted mainly from a drop in unmet need among women who wished to have no more children; in one, the proportion of demand for family planning being met by contraceptive use increased significantly (from 30% to 45%).

By contrast, in Sindh, close to three in 10 women in each clinic community had an unmet need for contraception at baseline, and the proportion did not change during the evaluation period. However, both communities showed significant reductions in the proportion of demand being met; one registered a reduction in demand for limiting births and an increase in unmet need for spacing.

Data from the end line survey suggest that the clinics were serving only a subgroup of their target population: Larger proportions of new clinic clients than of women obtaining family planning services from other sources were younger than 30, had a medium or high standard of living, and used reversible contraceptives other than condoms. Information gathered in the exit interviews likewise suggests that local clinic users had a relatively high socioeconomic status and were seeking reversible methods because they had few children. In addition, data from the exit interviews show that about one-quarter of clinic clients were poor women from outside the clinics' catchment areas, who either were high-parity and wished to obtain a permanent method of contraception or were young and were seeking pregnancy termination.

The researchers suggest that their findings have several programmatic implications. For example, the clinics' impact on contraceptive knowledge may have resulted partly from their use of community outreach workers; therefore, outreach may be an important component of clinic services in slum areas of Pakistan. Additionally, the apparent interest in female sterilization and the IUD suggests that clinics should focus on providing permanent or long-term methods. Nevertheless, given the findings on the characteristics of clinic users, the researchers conclude that "these clinics are not an effective strategy for providing family planning services to the poorest groups in the immediate clinic vicinity."—*D. Hollander*

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