

# Avoiding Unintended Pregnancy in Peru: Does the Quality of Family Planning Services Matter?

By Barbara S. Mensch, Mary Arends-Kuenning, Anrudh Jain and Maria Rosa Garate

*An analysis linking data on pregnancy intentions from the 1991–1992 Peru Demographic and Health Survey with information from a 1994 follow-up survey found that among 1,093 women from Nor-Oriental del Marañón and Lima who participated in both surveys, 20% had a mistimed or unwanted pregnancy in the 29 intervening months. In all, 15% had an unintended pregnancy ending in a live birth and 5% an unintended pregnancy with another outcome. The proportion having an unintended pregnancy was 32% in rural Nor-Oriental, 24% in urban Nor-Oriental and 13% in Lima. Unintended pregnancies were predominantly attributable to failure of a traditional contraceptive method (35% of such pregnancies) or nonuse of any method (26%). The proportion of women who failed to meet their reproductive goals between surveys declined as their education and the quality of available family planning services, as measured by a 1992 situation analysis, improved. The effect of quality of care on women's ability to avoid unwanted fertility was significant in logistic regression models including only service factors and women's demographic characteristics. In models including rural-urban residence and region, neither these variables nor quality of care had a significant effect.*

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The international family planning community generally acknowledges the importance of providing high-quality services. While one might hope that welfare considerations would encourage concern with quality of care in its own right, if program managers and donors are to be persuaded to devote their limited resources to the improvement of services, it is important to establish whether better services actually help prevent unintended pregnancies. Although it seems plausible that higher quality services are associated with increased and more effective contraceptive use, it could be that use of family planning is so strongly determined by the intensity of demand that supply-side factors are largely irrelevant in explaining variation in unwanted fertility.

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Using three data sets reflecting experiences in two regions of Peru—including a 1994 reinterview of women who participated in the 1991–1992 Demographic and Health Survey (DHS)—this article examines the reproductive goals of a sample of Peruvian women, the proportion who had an unintended pregnancy during a period of more than two years and the effect of the quality of family planning services on women's ability to avoid such pregnancies.

## Measuring Reproductive Goals

For many years, information on women's reproductive goals and levels of unintended pregnancies has come from their responses to direct questions in surveys. In the DHS, for example, respondents are asked, with reference to each pregnancy in the five years prior to the survey, whether their intention just before they conceived was to have more children then, to wait longer or to have no more children. As many demographers have argued, however, such questions may compromise the measurement of unwanted fertility because of some women's reluctance to acknowledge that some of their living children may not have been wanted.<sup>1</sup>

Questions about fertility intentions, on the other hand, avoid this bias. The DHS now asks women whether they would like to continue childbearing or whether they

would prefer not to have any more children. However, the possibility that individual women's fertility preferences are not stable raises reservations about the reliability of responses to such questions.

To assess whether women's responses about future childbearing have any predictive value, it is necessary to collect information from the same woman at two points in time. During the first interview, which constitutes the beginning of the observation period, the woman is asked about her reproductive intentions. At the end of the observation period, she is asked about all pregnancies and births that occurred since the first interview.

Despite the value of longitudinal surveys, the cost of administering them and concerns about high loss to follow-up have led to a reduction in such projects over time. More studies have been based on data collected 10–30 years ago than are based on current data, in part because of an interest (which has now apparently waned) in developing tools to forecast fertility.<sup>2</sup> In general, this research has found that intentions are strongly linked to fertility behavior.

While earlier panel studies were quite useful in establishing the validity of questions on desire for a future birth, they focused exclusively on women who wished to limit childbearing, ignoring whether those who wanted to space their births succeeded in avoiding a timing failure. In doing so, they artificially inflated the proportion of women who met their fertility goals, because many more women have a child "too early" than "too late."

In this analysis, by considering data on the same women at two points and including information on whether they wish to delay their pregnancies, we hope to assess more accurately the ability to meet reproductive intentions.

## Methods

### Data

Our analysis is based on a 1994 follow-up survey of a subsample of the 15,882 women interviewed for the 1991–1992 Peru DHS. Because of cost constraints, the target sample was limited to 1,850 married women living in two regions, Lima and

Nor-Oriental del Marañón. Lima was selected because of its importance; Nor-Oriental was chosen because it includes the country's three ecological zones (the jungle, the coast and the sierra) and thus should reflect maximum variability in reproductive behavior and quality of care.

In Lima, we randomly selected 115 of the 201 clusters included in the DHS. In Nor-Oriental, 75 of the 80 clusters included in the 1991–1992 survey were visited; four clusters were omitted because the names of the household heads were not recorded, and one because it was in a war zone. The sample was drawn and weights constructed by the Instituto Nacional de Estadística e Informática (INEI), the organization responsible for the DHS. The follow-up survey was conducted by the Instituto Andino de Estudios en Población y Desarrollo (INANDEP), under subcontract to the Population Council.

The follow-up questionnaire asked women about the timing of all pregnancies and births, as well as contraceptive use, since the first survey. Ever-users of contraceptives were asked to identify the facility they had last visited for family planning, their reasons for selecting that site and their opinion about the services. Past users were asked the reason they had discontinued use. Never-users were asked to identify family planning service sites, their reasons for nonuse and their opinions about the services available at the sites they mentioned.

Using identification numbers assigned for the DHS to match women, we combined results from the follow-up interview with selected data from the DHS and then linked them, by sampling cluster, to findings from a 1992 situation analysis. The situation analysis, a survey of family planning service delivery points, involved an inventory of facilities, exit interviews with staff and clients, and observation of client-

provider interactions. The data from this survey, carried out under the auspices of the Reproductive Health Administration of the Ministry of Health and the INEI, was used to measure quality of services.\*

The situation analysis was intended to replace the standard DHS service availability module. The sample, drawn from a universe of all family planning outlets within five kilometers (about three miles) of the clusters included in the DHS, consisted of 2,970 service points in 892 of the 901 DHS sampling clusters.<sup>3</sup>

#### *Loss to Follow-Up*

One reason demographers have shied away from panel studies is the loss to follow-up that inevitably occurs. This was potentially a serious problem in Peru because at the time of the DHS, there were no plans for a follow-up survey, and thus no special provisions were made that would have facilitated the location of respondents several years later.<sup>†</sup>

Considerable effort was expended to find the women who had been interviewed in 1991–1992. If a woman was absent at the first attempted contact, the interviewers were instructed to make as many as three visits at different times and on different days (including early in the morning, at night and on weekends) to try to locate her. The interviewers were also instructed to ask neighbors about the woman's whereabouts and, if need be, to visit her workplace—or, in rural areas of Nor-Oriental, to go to the fields to locate her. If the woman had moved, the interviewers tried to get her new address, and if it was within a five-kilometer radius of her old residence, they attempted to find her and conduct an interview.

Out of 1,852 women targeted for the follow-up survey, 74% (1,372) were interviewed. The proportion was the same in each region. To determine whether respondents in the follow-up survey were different in any way from nonrespondents, we compared women who were interviewed with those who were targeted but not interviewed on several characteristics. The groups are similar with respect to age, educational attainment and residence. The one characteristic that appears to differentiate them is parity: Whereas 86% of women who were interviewed have two or more children, the proportion is only 48% among nonrespondents.

We also ran a logistic regression to estimate the effect of each of these variables on the likelihood of a woman's being located and interviewed. Interestingly, only age had an effect, which was large and sig-

nificant: The younger the woman, the more likely she was to be lost to follow-up, undoubtedly because younger women are more mobile and have fewer children than their older counterparts. If younger women are more likely than their older counterparts to have unintended pregnancies, one possible consequence of having a reduced sample of younger women is an overestimate of women's ability to fulfill their reproductive intentions.

#### *Creating a Matched Sample*

One concern about revisiting women 2–3 years after an initial contact is the possibility that the wrong women may be identified for the interview. Fieldworkers from INANDEP were given the names of the selected women, their identification number from the DHS, the location of their residence and the name of their household head;‡ they also asked the women if they remembered being interviewed before. In a debriefing session, the fieldworkers indicated that they thought the correct women were found and that when the data from the DHS and the follow-up survey were inconsistent, it was because of inconsistencies in women's responses. They stated that some women in the follow-up reported younger ages than they really were, some of the DHS information was provided by a relative, some women forgot the birth dates of their children and some women forgot about live births if the child had died.

On the other hand, including in the analysis women who had not participated in the DHS would result in a misestimation of the proportion of women who achieved their reproductive intentions. Thus, using the same identifying-type questions asked in both surveys, we selected only those women from the follow-up sample who we felt virtually sure had been interviewed before.

Our criteria for identifying correct matches were consistent responses for the respondent's year of birth and the number of children she had ever borne. We selected the year of birth because it should not have changed over time and the number of births because it is critical to the analysis and should have changed only by the number of births that occurred between surveys. We considered a woman's responses for her year of birth consistent between surveys if they were the same or differed by one. For the number of children ever born, we considered responses consistent if the number a woman reported in the follow-up was equal to or—allowing for the effects of child mortality—

\*INOPAL II, the Population Council's operations research project conducted under contract with the U.S. Agency for International Development, provided funding and technical assistance. The Asociación Benéfica PRISMA (Proyectos en Informática, Medicina, y Agricultura), a private Peruvian organization, was responsible for the survey's administration.

†Before interviewers administered the follow-up instrument, they reminded each respondent that she had been visited 2–3 years earlier and asked her to participate.

‡In 10 clusters in Nor-Oriental, the fieldworkers could not obtain the names of the original respondents but were given the names of the household heads from the DHS database. They interviewed all eligible women in the household and subsequently used the DHS data to determine which of the women had been interviewed in 1991–1992. In 35 cases from these clusters, the questionnaire was thrown out because the DHS respondent could not be identified.

ty—one less than the number she gave in the DHS plus the number she had between the two interviews.\*

Of the 1,372 women who were reinterviewed, 63 could not be matched to the DHS because of discrepancies in their identification numbers, and two did not provide information on schooling. Using the criteria discussed above, the remaining 1,307 women were classified according to whether their reporting of their age and number of births was consistent between the two surveys. Overall and in each region, 84% of these women gave consistent responses. All subsequent analyses are based on these 1,093 women, who we feel confident were the same women interviewed in the DHS. (Results for the full sample of 1,307 women are available from the authors.)

### *Constancy of Fertility Intentions*

Have demographers, in their concern with explaining fertility behavior, improperly reified the concept of reproductive intentions? Is it just a construct of survey data, or is it an accurate reflection of women's thoughts about additional childbearing? In assessing whether women in the follow-up sample were able to avoid having unwanted and mistimed births between interviews, we assume that responses about childbearing desires are meaningful and reveal a strongly held preference about the future. By comparing women's answers at each interview to the same question on reproductive intentions, we can assess the reliability of these data.

Of the 1,063 women who responded to the question about childbearing desires in both surveys, 72% gave the same response in the DHS and the follow-up, 16% initially said they wanted more children but later changed their minds and 13% changed from wanting no more children to wanting more. Among those with inconsistent answers, however, a considerable proportion of the discrepancy can be explained by events that occurred between interviews.

Of the women who had indicated in the DHS that they wanted more children but stated in 1994 that they wanted no more, 68 had had one child between surveys, and an additional 12 had experienced a marital disruption. The inconsistencies in the responses of these 80 women (who constitute 8% of the sample) are therefore logical. Similarly, among women who had reported in the DHS wanting no more children but changed their minds, five (1% of the sample) had experienced the death of a child between surveys and therefore

were considered to have provided reasoned responses.

Thus, 81% of the sample either provided consistent responses over time or changed their minds for reasons that are easily explained by the women's experiences between interviews. In our view, this finding is persuasive evidence of the reliability of survey questions about reproductive intentions.†

### *Classifying Births and Pregnancies*

The first step in determining whether a woman met her fertility goals was to establish a cutoff for the period of exposure to the risk of pregnancy. That cutoff was the minimum number of months in which all women in the sample were exposed to the risk of conception. The DHS took place between October 1991 and March 1992, and the follow-up survey between July and September 1994. Therefore, theoretically, the minimum number of months between interviews was 28; however, the actual minimum interval was 29 months. Thus, only pregnancies that began within 29 months after the DHS interview were included in the computation. All pregnancies were included, regardless of their outcome.

We classified women as having failed to meet their reproductive intentions if they had an unintended pregnancy between surveys—that is, they became pregnant even though they wanted no more children (unwanted pregnancy) or they became pregnant at least three months earlier than desired (mistimed pregnancy).

Women who wanted another child and did not have one during the interval are considered to have met their reproductive intentions. We included them in the successful category for two reasons: First, given that only about two years had passed between surveys, many women still had a number of years in which they might become pregnant. Second, although some might not have become pregnant because of impaired fertility, family planning programs in developing countries rarely view the treatment of infecundity as part of their mission.‡

### *Assessing Service and Other Factors*

The measurement of the quality of family planning services was based on, and constrained by, the data available in the 1992 situation analysis. Although seven data collection instruments were used, the survey was far from ideal in assessing the quality of care provided to clients. Given the geographic coverage of the situation analysis and the number of service points

visited, the detail and scope of its data on client experiences were limited.

A quality index was created that incorporates eight dimensions of services, measured at the level of the DHS cluster: availability of modern contraceptive methods; provider bias toward methods (the extent to which providers routinely do not recommend certain methods); provider restrictiveness (whether providers require that clients be of a specific age and parity, be married or obtain partner consent before receiving particular temporary methods); information provided about methods, including details about contraindications, side effects and correct use; provider training in family planning; cleanliness (including an assessment of sheets, floors and windows; presence of a wash basin, soap and towel; and whether the provider washed hands and used gloves); visual and auditory privacy in consulting rooms; and availability of immunizations, Pap smears and pregnancy tests. (A detailed discussion of the situation analysis, the measurement of the service environment and the justification for the use of an index appears elsewhere.‡)

The quality index ranges from 0 to 8. For the initial analyses, an index of 0.00–2.66 indicates low quality, 2.67–5.33 indicates medium quality and 5.34–8.00 indicates high quality. A dummy variable measuring service availability is also included, which indicates the presence in the cluster of at least one private physician, clinic, store, pharmacy or community-based distributor offering a family planning method.

Since service availability and quality are measured at the cluster level, all women resident in the same cluster are assigned the same value for the service variables. However, we know from a previous study that some women in clusters without any services practice contraception and thus must go outside their cluster of residence

\*The decision about which variables to use for determining an accurate match was based on a study conducted in Nigeria. (See: A. Bankole, G. Rodriguez and C. F. Westoff, 1994, reference 8.)

†It could be argued that because women in the matched sample are known to provide identical answers to analogous questions at two points in time, this analysis may be biased in favor of finding consistency. However, when we expand the sample to include all those interviewed in the follow-up survey, and not just those providing matching answers to the identifying questions, the outcome is the same: Of the 1,271 women for whom data were available in both surveys, 72% gave consistent responses.

‡Were we to transfer such women to the failure category, the effect of program quality on the fulfillment of reproductive intentions would depend on the distribution of the quality variables for this group. If most of these women resided in areas with inferior services, the quality effect would increase; if they came from areas with better services, the effect would diminish.

**Table 1. Percentage of women who had an unintended pregnancy between the 1991–1992 Demographic and Health Survey and the 1994 reinterview, by region and planning status of the pregnancy, according to outcome, Peru**

| Region and planning status        | Total       | Births      | Other outcomes† |
|-----------------------------------|-------------|-------------|-----------------|
| <b>Total (N=1,093)</b>            | <b>19.6</b> | <b>14.6</b> | <b>5.0</b>      |
| Unwanted                          | 13.8        | 10.2        | 3.6             |
| Mistimed                          | 5.8         | 4.4         | 1.4             |
| <b>Rural Nor-Oriental (N=219)</b> | <b>31.9</b> | <b>26.9</b> | <b>5.0</b>      |
| Unwanted                          | 23.7        | 20.5        | 3.2             |
| Mistimed                          | 8.2         | 6.4         | 1.8             |
| <b>Urban Nor-Oriental (N=293)</b> | <b>24.2</b> | <b>17.8</b> | <b>6.4</b>      |
| Unwanted                          | 16.7        | 12.3        | 4.4             |
| Mistimed                          | 7.5         | 5.5         | 2.0             |
| <b>Lima (N=581)</b>               | <b>12.6</b> | <b>8.4</b>  | <b>4.2</b>      |
| Unwanted                          | 8.6         | 5.3         | 3.3             |
| Mistimed                          | 4.0         | 3.1         | 0.9             |

†Includes women who were pregnant at the time of the follow-up interview.

to obtain services.<sup>5</sup> Assigning the wrong service variables to women probably results in an underestimate of the effect of services on women’s ability to achieve their reproductive intentions.

Data on women’s characteristics are obtained from the DHS. The criterion for inclusion of a variable was that it tapped some personal, household or community attribute that might affect, either directly or indirectly, a woman’s ability to fulfill her fertility preferences. The following variables were selected: age, education, indigenous language, partner’s occupation and exposure to mass media family planning messages in the month before the survey (dichotomous variables); household wealth (an index based on whether the woman’s house has a nondirt floor and whether she owns a car, bicycle, motorcycle and refrigerator); public services (an index of services available for the household, including garbage collection, indoor plumbing, electricity and sewers); and region (Lima, urban Nor-Oriental or rural Nor-Oriental).

### Unintended Pregnancy

During the 29 months between surveys, 20% of the women had an unintended pregnancy—15% an unintended pregnancy that ended in a birth and 5% an un-

\*Seventeen women had multiple pregnancies between surveys. Given the wording of the DHS question, it is not possible to have both unwanted and mistimed pregnancies, but it is possible to have multiple unwanted or mistimed events. If a woman had an unwanted birth and an unwanted pregnancy, she was categorized as having had an unwanted birth. If a woman had a mistimed birth and a mistimed pregnancy, she was categorized as having had a mistimed birth.

intended pregnancy that had another outcome (Table 1). A substantially higher proportion had an unwanted than had a mistimed pregnancy (14% vs. 6%).\*

Women in the rural area of Nor-Oriental are the least successful in meeting their reproductive intentions. Some 32% of women there had an unintended pregnancy—a considerably higher proportion than among their urban counterparts (24%) and more than twice that in Lima (13%). Furthermore, 21% of rural Nor-Oriental women had an unwanted birth, compared with 12% in the region’s urban area and 5% in Lima.

To the extent that pregnancies not ending in live births are underreported, the measurement of women’s ability to avoid unintended pregnancy is underestimated. Although abortion is illegal in Peru except under the most restricted conditions, available estimates suggest that for every 10 births, there are two induced abortions.<sup>6</sup> Assuming that women underreport pregnancies ending in abortion rather than report them as miscarriages, the high level of pregnancy termination would lead one to expect that the level of unintended pregnancy estimated here is too low.

For evaluating family planning programs, it is especially useful to know the reason a woman was unable to meet her reproductive intentions. Unintended pregnancies among women in the sample are disaggregated in Table 2 according to the reason for the pregnancy. The data are based on contraceptive behavior during the interval between interviews, including, if appropriate, the type of method used.

Overall, 5% of women had an unintended pregnancy attributable to contraceptive nonuse, and 7% experienced the failure of a traditional method. These women represent 35% and 26%, respectively, of those who became pregnant unintentionally. Approximately 2% of women had an unintended pregnancy while using a modern method, and another 4% had such a pregnancy shortly after discontinuing use of a modern method. We categorize the latter as having had a switching failure, on the assumption that they conceived before they had an opportunity to begin using another modern method.

Despite indicating in 1991–1992 that they wanted to discontinue or postpone further childbearing, 2% of

women said in 1994 that they stopped contraceptive use between interviews because they wanted to become pregnant. Since our designation of women as having an unintended pregnancy is based on their fertility intention as stated in the DHS, these women are considered not to have met their reproductive goals.

The regional differentials in reasons for unintended pregnancy are quite revealing. The proportions of women with an unintended pregnancy attributable to not using a method and to using a traditional method that failed are much larger in the rural part of Nor-Oriental (11% and 16%, respectively) than in Lima (2% and 3%) or urban Nor-Oriental (7% and 8%). Thus, 83% of the failure to meet reproductive intentions in the rural part of Nor-Oriental can be attributed to nonuse or traditional method use, compared with 40% of the failure in Lima and 61% in urban Nor-Oriental. These results suggest that a lack or inadequacy of family planning services may have led to the high incidence of unwanted and unplanned births and pregnancies there.

### Service vs. Personal Factors

Having determined that a considerable proportion of women in the sample failed to meet their reproductive goals, we turned to an evaluation of the extent to which the absence of high-quality family planning services and women’s characteristics contributed to these failures. The data in the following analyses are limited to women at risk of a particular event.

#### Bivariate Results

Table 3 indicates the proportion of women who had an unintended pregnancy by the quality of care available in their cluster and their level of education. We have selected education here because among socioeconomic variables, it has consistently been shown to have a strong effect on reproductive behavior:<sup>7</sup> Better educated women are more likely to control their fer-

**Table 2. Percentage of women who had an unintended pregnancy between interviews, by reason, according to region**

| Reason                     | Total       | Rural Nor-Oriental | Urban Nor-Oriental | Lima        |
|----------------------------|-------------|--------------------|--------------------|-------------|
| <b>All reasons</b>         | <b>19.6</b> | <b>32.1</b>        | <b>24.2</b>        | <b>12.5</b> |
| No method used             | 5.0         | 11.0               | 7.2                | 1.7         |
| Traditional method failure | 6.9         | 15.6               | 7.5                | 3.3         |
| Modern method failure      | 1.8         | 0.9                | 2.0                | 2.1         |
| Method switching failure†  | 3.9         | 2.3                | 5.1                | 3.7         |
| Wanted pregnancy‡          | 2.0         | 2.3                | 2.4                | 1.7         |

†Failure occurring after a woman stopped using a modern method. ‡This group consists of women who reported in the DHS that they wished to discontinue or postpone childbearing, but who discontinued contraceptive use between surveys.

**Table 3. Percentage of women who had an unwanted birth or an unintended pregnancy between interviews, by quality of care in their sampling cluster and by education**

| Quality of care and education | Unwanted birth |             | Unintended pregnancy |             |
|-------------------------------|----------------|-------------|----------------------|-------------|
|                               | N              | %           | N                    | %           |
| <b>Total</b>                  | <b>704</b>     | <b>15.9</b> | <b>1,003</b>         | <b>21.0</b> |
| <b>Quality of care</b>        |                |             |                      |             |
| Low                           | 223            | 21.5        | 310                  | 26.5        |
| Medium                        | 105            | 22.9        | 150                  | 25.3        |
| High                          | 376            | 10.6        | 543                  | 16.8        |
| <b>Education (yrs.)</b>       |                |             |                      |             |
| 0-4                           | 171            | 20.5        | 207                  | 24.2        |
| 5-10                          | 230            | 21.7        | 322                  | 26.1        |
| 11-15                         | 248            | 8.9         | 382                  | 16.8        |
| ≥16                           | 55             | 9.1         | 92                   | 14.1        |

Note: Differences between high quality and other quality ratings are significant at  $p < .01$ . Differences between the two highest education categories and the lowest two are significant at  $p < .01$ .

tivity and have a higher opportunity cost of childbearing. Additionally, we have analyzed unwanted births separately because having an unwanted birth is more problematic than having a mistimed birth or an unintended pregnancy not ending in a live birth.

The table shows that while residence in a cluster with medium-quality, compared with low-quality, care makes no difference in women's ability to fulfill their reproductive intentions, residence in a cluster with high-quality care has a large and significant effect. Only 11% of women in clusters with high-quality services had an unwanted birth between interviews, compared with 22-23% of those living in clusters with low- or medium-quality care. For unintended pregnancy, the pattern is the same, although the difference is somewhat smaller.

Education also has a threshold effect. The proportion of women who failed to meet their reproductive goals does not differ between those with 5-10 years of education and those with 0-4 years of schooling (21-22% for unwanted births and 24-26% for unintended pregnancies). Nor does the proportion differ between women with 16 or more years of education and those with 11-15 years (9% for unwanted births and 14-17% for unintended pregnancies). However, the difference between those with 10 or fewer years of schooling and those with 11 or more is considerable and statistically significant.

On the basis of these results, for subsequent analyses, education and quality are each divided into two categories: We classified 10 or fewer years of schooling as low education and 11 years or more as high education. For quality of care, a score of

0.00-5.33 signifies low quality, and 5.34-8.00 denotes high quality.

Table 4 presents the proportion of women not meeting their reproductive intentions, by combined quality and education categories. Education has a significant effect within categories of quality, and quality of care has a significant effect within categories of education. The effects for unwanted births are additive. Improvement in either education or quality reduces the proportion who had an unwanted birth by 10-11 percentage points, while improvement in both reduces it by 21 percentage points.

Interestingly, both quality of care and education have a stronger effect on unwanted births than on total unintended pregnancies. If one restricts the analysis to mistimed births and unintended pregnancies not ending in live births, differentials by education and quality of care are attenuated: That is, while education and quality of care affect a woman's ability to avoid unwanted childbearing, neither has a significant impact on the incidence of mistimed births or unintended pregnancies not ending in live births.

#### Multivariate Results

To assess the impact of the quality of services (as well as the variables described earlier) on the failure to meet reproductive intentions, we estimated a series of logistic regression models. Given that quality of care has a minimal effect on mistimed births and on unintended pregnancies not ending in a live birth, these analyses are restricted to models estimating unwanted births.

The first model is limited to the two service variables, quality of care and service availability. Service availability is included because we do not want to confound the effect of poor but available services with that of less available services of unknown quality. The first column of Table 5 (page 26) indicates that quality of care has a strong and significant role in reducing the probability of an unwanted birth, while service availability has a weak and nonsignificant effect.

The second column presents the coefficients for an extended model that adds a number of socioeconomic and demographic variables believed to be associated with women's ability to prevent unwanted fertility. While the magnitude of the quality coefficient is diminished, it remains significant when these variables are included. In addition, education, age and household wealth have large and significant effects. The more schooling a woman

has, the older she is and the more affluent her household is, the less likely she is to have an unwanted birth. Interestingly, despite renewed attention in the literature to the role of mass media messages promoting family planning,<sup>8</sup> having heard such messages had no effect on women's ability to avoid unwanted births during the interval under analysis.

While it is tempting, in view of the results for the second model, to place some emphasis on high-quality services for the reduction of unwanted births, one must take care not to overinterpret the effect. One explanation may be that women who live in areas with better services are selected for certain unobservable characteristics that predispose them to have fewer unwanted births. Alternatively, higher quality services may be deliberately situated in areas where the demand for them is greater. In either case, it may not be that the presence of high-quality services prevents unwanted births.

The last two columns of the table present results from models that include rural-urban residence and region. When each of these residential variables is included in a separate model with quality, neither it nor quality is significant. Adding region reduces the coefficient for quality from -0.577 to -0.437. For the model with rural-urban residence, the coefficient changes only to -0.555, and the standard error increases from .278 to .289 (not shown), with the result that quality just barely misses statistical significance.

Because region and quality are quite collinear ( $r = -.48$  for Lima and quality, and  $-.54$  for Nor-Oriental rural and quality), it is difficult to separate the effect of region

**Table 4. Percentage of women who had an unwanted birth or an unintended pregnancy between interviews, by education, according to quality of care**

| Level of education          | Quality of care |      |
|-----------------------------|-----------------|------|
|                             | Low             | High |
| <b>UNWANTED BIRTH</b>       |                 |      |
| <b>Low</b>                  |                 |      |
| %                           | 25.9            | 14.7 |
| N                           | 212             | 116  |
| <b>High</b>                 |                 |      |
| %                           | 15.9            | 5.4  |
| N                           | 189             | 187  |
| <b>UNINTENDED PREGNANCY</b> |                 |      |
| <b>Low</b>                  |                 |      |
| %                           | 30.5            | 18.9 |
| N                           | 285             | 175  |
| <b>High</b>                 |                 |      |
| %                           | 19.3            | 14.7 |
| N                           | 244             | 299  |

Note: Differences by quality within education categories and differences by education within quality categories are significant at  $p < .01$ .

**Table 5. Logistic regression coefficients predicting the probability of unwanted births, by service factors and women's characteristics**

| Service factors and characteristics       | Limited model | Extended model | Extended plus urban/rural | Extended plus region |
|---|---------------|----------------|---------------------------|----------------------|
| High quality of care                      | -0.855***     | -0.577*        | -0.555                    | -0.437               |
| Services available                        | -0.034        | 0.586          | 0.638                     | 0.694                |
| ≥11 yrs. education                        | na            | -0.621*        | -0.620*                   | -0.593               |
| Heard mass media family planning messages | na            | 0.139          | 0.146                     | 0.207                |
| Age                                       |               |                |                           |                      |
| 20-29                                     | na            | -0.594         | -0.600                    | -0.678               |
| 30-39                                     | na            | -1.085         | -1.093                    | -1.150               |
| 40-49                                     | na            | -2.927***      | -2.941***                 | -3.027***            |
| Speaks indigenous language                | na            | 1.407          | 1.410                     | 1.395                |
| Partner's occupation                      |               |                |                           |                      |
| Service worker                            | na            | 0.034          | 0.079                     | 0.191                |
| White-collar worker                       | na            | -0.117         | -0.082                    | 0.006                |
| Household wealth index                    | na            | -0.610*        | -0.605*                   | -0.522               |
| Public service index                      | na            | -0.077         | -0.035                    | 0.101                |
| Urban residence                           | na            | na             | -0.138                    | na                   |
| Region                                    |               |                |                           |                      |
| Urban Nor-Oriental                        | na            | na             | na                        | -0.166               |
| Lima                                      | na            | na             | na                        | -0.806               |
| Constant                                  | -1.240        | -0.186         | -0.208                    | -0.239               |
| -2 log likelihood                         | 703.999       | 683.296        | 514.099                   | 616.928              |

\*p<.05. \*\*p<.01. \*\*\*p<.001. Note: na=not applicable.

from that of quality. Not only are the region variables strongly associated with quality, they are correlated ( $r>.4$ ) with other variables in the models, especially household wealth and education. In contrast, the correlation coefficients are small ( $<.2$ ) for quality and each of these two variables. Moreover, neither region variable is significant in multivariate models with quality and service availability omitted (not shown), whereas quality is significant ( $p<.05$ ) in predicting unwanted births when region is omitted from the model.

We further explored the relationship between region and quality by running separate models for Lima, Nor-Oriental and a sample combining Lima and the urban part of Nor-Oriental. We did not run separate models for the rural and urban parts of Nor-Oriental because of small samples.

The quality of care coefficients for Lima (-0.679) and the combined urban sample (-0.540) are higher than that for Nor-Oriental (-0.393). Thus, although none of the coefficients achieve significance (in part

\*Even if a family planning program does not have an explicit policy to induce couples to have fewer children, diffusion effects may be operating that alter family-size desires. It has been argued that estimates of program effectiveness might increase were diffusion dynamics taken into account. (See: M. R. Montgomery and J. B. Casterline, "The Diffusion of Fertility Control in Taiwan: Evidence from Pooled Cross-Section Time-Series Models," *Population Studies*, 47:457-479, 1993.)

†While the quality of care received by a user can be observed directly, no direct measurement of quality is possible for nonusers. Thus, nonusers would still have to be assigned quality measures.

because of small sample sizes), the results suggest that the more urban the area, the greater the impact of quality, perhaps because women in larger metropolitan centers with better transportation and communication networks can take advantage of higher quality family planning services.

## Discussion

The performance of a family planning program is generally evaluated in terms of its impact on contraceptive prevalence and fertility rates. Jain and Bruce have argued, however, that reliance on these standard demographic indicators for program

assessment implicitly assumes that programs have an effect on reducing wanted as well as unwanted fertility.<sup>9</sup> They contend that promotional activities and motivational messages designed to influence family size have at most a very limited impact, and that family planning programs cannot—and should not—bear the full responsibility for reducing wanted fertility.

While gaining support, this view is not within the mainstream. Westoff, for example, argues that it is not sufficient for programs to simply satisfy the unmet need for family planning; using mass media campaigns and other strategies, he contends, they also must create a demand for fertility control and small families.<sup>10</sup>

We accept the notion that changing couples' childbearing goals is, to a considerable extent, outside the purview of family planning programs. Rather, programs' main objective should be to assist individuals in realizing their childbearing goals through the provision of accessible, affordable and high-quality family planning services.\*

By linking data from the DHS, a follow-up survey and a situation analysis, we have investigated the impact of the quality of family planning services on the ability of women in two regions of Peru to achieve their reproductive intentions over a period of 29 months. The loss to follow-up for the second interview was not trivial: Of the 1,852 women targeted, 1,307 were reinterviewed, and we are only certain that 1,093 of these participated in the

DHS. However, if we have omitted some DHS participants, the consequence is probably an overestimation of women's ability to avoid unintended pregnancies.

We found that questions measuring reproductive intentions generated consistent answers and that by 1994, 20% of the women had failed to meet their reproductive intentions as stated in 1991-1992. Over an entire reproductive lifetime, this proportion would undoubtedly be much larger.

While we would like to claim that Peru demonstrates the importance of high-quality services in reducing unwanted childbearing, the data do not permit us to be that definitive. Unfortunately, because the quality of services is low in one of the areas included in the analysis (rural Nor-Oriental) and high in another (Lima), it is difficult to separate the effect of quality of services from that of region of residence.

We believe, however, that a convincing case can be made for the role of quality. First, as was mentioned earlier and is discussed in detail elsewhere,<sup>11</sup> the available situation analysis data do not measure quality of care very precisely; in fact, quality may be measured less accurately than other variables included in the models. Moreover, although we assumed that all women living in a cluster were exposed to the same quality of care, we know that women go outside their home cluster for family planning services. If quality could be measured with less error and we could determine the quality of services actually available to each woman, the effect of quality on women's ability to avoid unwanted births might be higher.†

Second, while inclusion of region and rural-urban location reduces the effect of quality, these factors do not, in and of themselves, influence the rate of unwanted fertility; they are simply proxies for unobserved variables. Given the pronounced regional and rural-urban differentials in development that exist in Peru, and given that many other socioeconomic factors that might affect unwanted fertility are already included in the model, it would not be surprising to find that these geographic variables reflect unmeasured differences in quality.

If the goal of the Peruvian family planning program is restricted to helping women avoid unwanted childbearing, our results indicate that a considerable challenge remains. Therefore, some might question the advisability of burdening the program with the added responsibility of reducing wanted fertility. Rather, concentrating limited resources on improving the quality of care provided should fa-

cilitate Peruvian women's ability to have the children they want when they want them. Achieving this goal, in and of itself, would lower the total fertility rate.

## References

1. J. Bongaarts, *The Measurement of Wanted Fertility*, Research Division Working Papers, No. 10, Population Council, New York, 1990.
2. A. I. Hermalin et al., "Do Intentions Predict Fertility? The Experience in Taiwan, 1967-74," *Studies in Family Planning*, 10:75-95, 1979; C. F. Westoff and N. B. Ryder, "The Predictive Value of Reproductive Intentions," *Demography*, 14:431-453, 1977; and W. I. De Silva, "Achievement of Reproductive Intentions in Sri Lanka, 1982-1985: A Longitudinal Study," *Social Biology*, 39:123-138, 1992.
3. B. S. Mensch, M. Arends-Kuenning and A. K. Jain, "The Impact of the Quality of Family Planning Services on Contraceptive Use in Peru," *Studies in Family Planning*, 27:59-75, 1996.
4. Ibid.
5. M. Arends-Kuenning, B. S. Mensch and M. R. Garate, "Comparing the Peru Service Availability Module and Situation Analysis," *Studies in Family Planning*, 27:44-51, 1996.
6. Servicios Urbanos y Mujeres de Bajos Ingresos and Population Council, "Fecundidad y Aborto en el Perú," data sheet, Population Council, Lima, Peru, 1994; and S. Singh and D. Wulf, "Estimating Abortion Levels in Brazil, Colombia and Peru Using Hospital Admissions and Fertility Survey Data," *International Family Planning Perspectives*, 17:8-13 & 24, 1991.
7. T. P. Schultz, "Returns to Women's Education," in E. M. King and M. A. Hill, eds., *Women's Education in Developing Countries: Barriers, Benefits, and Policies*, Johns Hopkins University Press, Baltimore, Md., USA, 1993, pp. 51-99; and K. Subbarao and L. Raney, *Social Gains from Female Education: A Cross-National Study*, World Bank Discussion Papers, No. 194, World Bank, Washington, D. C., 1994.
8. A. Bankole, G. Rodríguez and C. F. Westoff, "Mass Media Messages and Reproductive Behavior in Nigeria," paper presented at the annual meeting of the Population Association of America, Miami, Fla., USA, May 4-7, 1994; T. W. Valente et al., "Radio Promotion of Family Planning in The Gambia," *International Family Planning Perspectives*, 20:96-100, 1994; and P. T. Piotrow et al., "Mass Media Family Planning Promotion in Three Nigerian Cities," *Studies in Family Planning*, 21:265-274, 1990.

9. A. K. Jain and J. Bruce, "A Reproductive Health Approach to the Objectives and Assessment of Family Planning Programs," in G. Sen, A. Germain and L. C. Chen, eds., *Population Policies Reconsidered: Health, Empowerment, and Rights*, Harvard University Press, Cambridge, Mass., USA, 1994, pp. 193-209.

10. C. F. Westoff, "International Population Policy," Office of Population Research, Princeton University, Princeton, N. J., USA, 1995.

11. B. S. Mensch, M. Arends-Kuenning and A. K. Jain, 1996, op. cit. (see reference 3).

## Resumen

Un análisis que vincula datos de la Encuesta Demográfica y de Salud Familiar del Perú, de 1991-1992, con los de una encuesta de seguimiento realizada en 1994 y de un análisis de situación de 1992, revela que entre las 1.093 mujeres de la zona del Nor-Oriental del Marañón y de Lima que participaron en ambas encuestas, el 20% tuvo embarazos fuera de tiempo o no deseados durante el período de 29 meses entre las dos encuestas. En total, el 15% tuvo un embarazo no planeado que concluyó con un nacimiento vivo y el 5% un embarazo no planeado con otros resultados. El porcentaje de quienes tuvieron embarazos no planeados fue del 32% en la zona rural del Nor-Oriental, el 24% en la zona urbana del Nor-Oriental y el 13% en Lima. Los embarazos no planeados se debieron principalmente a la falla de los métodos anticonceptivos tradicionales (el 35% de estos embarazos) o a no utilizar ningún método (26%). El porcentaje de mujeres que no obtuvieron sus metas reproductivas disminuyó según las mejoras en el nivel educativo y la disponibilidad de servicios de planificación familiar registradas en el análisis de situación de 1992. El efecto de la calidad de la atención de la salud con respecto a la capacidad de la mujer para evitar una fecundidad no deseada fue significativo, de acuerdo con modelos de regresión logística que incluyeron solamente los factores relacionados con el servicio y las características demográficas de la mujer. En los modelos

en los que se incluyeron el lugar de residencia rural-urbana o regional, ninguna de estas variables ni la calidad de la atención de la salud reflejaron un efecto significativo.

## Résumé

Une analyse de corrélation des données relatives aux intentions de grossesse extraites de l'Enquête démographique et de santé péruvienne de 1991-1992 avec celles d'une étude de suivi menée en 1994 révèle, parmi les 1.093 femmes originaires de Nor-Oriental del Marañón et de Lima ayant participé aux deux enquêtes, que 20% avaient connu une grossesse inopportune ou non désirée pendant les 29 mois survenus entre les deux enquêtes. Au total, 15% avaient connu une grossesse inopportune ayant abouti sur une naissance vivante et 5%, une grossesse inopportune conclue par un autre résultat. La proportion des femmes qui avaient connu une grossesse inopportune était, respectivement, de 32% et de 24% dans les milieux ruraux et urbains de Nor-Oriental, et de 13% à Lima. Les grossesses non désirées étaient essentiellement imputables à l'échec d'une méthode de contraception traditionnelle (35% des cas) ou à l'absence de méthode quelconque (26%). La proportion des femmes qui avaient échoué, dans leurs objectifs de procréation, entre les deux études, était moindre parmi les femmes qui avaient bénéficié d'un meilleur niveau d'instruction et de services du planning familial de meilleure qualité, tels que mesurés par une analyse de situation réalisée en 1992. L'effet de la qualité des prestations offertes aux femmes sur leur capacité d'éviter les problèmes de fécondité non désirée s'est révélé net dans les modèles de régression logistique limités aux seuls facteurs de services et caractéristiques démographiques des femmes. Dans les modèles incluant les facteurs de résidence rurales ou urbaine et de région, aucune de ces variables, pas plus que la qualité des soins, n'ont révélé d'effet significatif.

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