CHAPTER 9

Data Triangulation: Using Multiple Methods To Estimate and Validate Abortion Incidence and Prevalence

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This volume describes a wide range of data collection methods that have been used to estimate abortion incidence, prevalence, mortality and morbidity in different settings around the world. Since each of these methods has its limitations, there are advantages to using two or more research methods to triangulate findings and cross-check results for consistency. The use of multiple methods can enhance confidence in overall conclusions and offset the biases or shortcomings of any single method. This strategy is useful in both developed and developing countries, as well as in restrictive and liberal legal settings. Indeed, in all settings and situations, highly stigmatized events such as induced abortions are likely to be underreported, which makes assessing their true magnitude especially challenging and the advantages of triangulation particularly compelling.

Different methods of measuring abortion have contrasting reliability and validity. Reliability refers to whether the methodology generates consistent results when used by other researchers in similar settings, whereas validity refers to the extent to which a given methodology actually measures what it is intended to measure. For example, indirect estimation techniques based on hospital abortion statistics may be more reliable at estimating abortion incidence (or prevalence) than either direct estimation techniques (i.e., face-to-face surveys) or data collected through other indirect methods (such as the Randomized Response Technique [RRT] or computer-assisted self-administered surveys), some of which can be more costly and difficult to field than hospital-based estimation methods.

As noted above, the validity of study findings is strengthened when two or more methods for measuring the same construct or phenomena yield mutually reinforcing results. Whenever possible, researchers should weigh the pros and cons of different methods and choose one that will yield the most reliable results. If possible, the results of a study should be compared and contrasted to (triangulated with) other similar studies to improve their validity.

Studies that use two or more distinct estimation methodologies are particularly valuable to better measure and understand the often stigmatized, clandestine nature of induced abortion. An example of such an approach is the Abortion Incidence Complications Method (AICM, see Chapter 6), in which postabortion hospital admissions data are complemented by data obtained from surveys of health professionals. While admissions data provide information about abortion complications that are treated in hospitals, the survey data shed light on the proportion of abortions that cause serious complications and the likelihood that women who develop complications requiring facility-based care will receive it. Data gathered from both methods are combined to indirectly estimate rates of induced abortion in a country (Singh and Wulf 1994).

Another example of a mixed-method approach is the use of information from different sources to understand the effect of illegal misoprostol use on hospital admissions from abortion complications (see Chapter 14). Data obtained using quantitative methods such as national-level surveys of women, Health Professionals Surveys (HPS) and annual misoprostol sales are combined with findings obtained from a mystery client study in which trained interviewers act out different scenarios in which they request abortifacient medications in pharmacies (Lara et al. 2007). The information from the four methodologies is combined to confirm or validate an indirect estimate of the proportion of hospitalized postabortion cases that can reasonably be attributed to misoprostol use.

In countries that have accurate abortion reporting systems, data obtained from direct estimation methodologies, such as face-to-face interviews or audio computer-assisted self-interviews (ACASI) can be validated against data from existing reporting systems and from other approaches, such as surveys of abortion providers (Fu et al. 1998; Jones and Kost 2007). In settings where official statistics on abortion are scarce, multiple methodologies can be applied to obtain a range of estimates that, when taken together, are more likely to be closer to "reality" than any one method alone. This volume contains many examples of using multiple methods to validate results (see also Chapters 4, 5 and 8). Below we—with the collaboration of the researchers involved in three cases—summarize findings from several studies in which researchers used multiple methods to validate estimates of abortion incidence. Each section presents information about the accuracy of

the estimates that resulted from the application of each method, as well as its advantages and disadvantages.

Part I. Direct Estimates vs. Indirect Estimates Using the Residual Technique, Bangladesh

Heidi Bart Johnston

Johnston (2007) used data from ICDDR,B's Matlab study area in rural Bangladesh to compare direct estimates of abortion rates with indirect estimates obtained from the residual estimation technique based on rearranging the Bongaarts proximate determinants of fertility model (see Chapter 4). The data sources for the direct estimates were the following three face-to-face surveys: 1) an Abortion Frequency Survey (AFS) conducted with a stratified random sample of 909 women in the Matlab area in 1997; 2) the Matlab Demographic Surveillance System (DSS), a longitudinal study conducted in the Matlab area since the mid-1960s; and 3) the cross-sectional, Matlab Demographic and Health Survey (MDHS), a DHS-like survey that was conducted among 3,225 women in 1994. The DSS and the MDHS also provided the data needed to calculate the residual estimates. The investigator compared direct and indirect (residual) estimates of abortion rates for three areas: the total Matlab study area, and two areas within the Matlab study area—the area exposed to ICDDR,B's Maternal Child Health–Family Planning (MCH-FP) intervention; and a comparison (control) population.

Table 1 compares the 1997 AFS direct estimates with all others—direct estimates from the 1994 MDHS, and the 1994 and 1996 DSS, and indirect residual estimates calculated using the 1994 MDHS, and the 1994 and 1996 DSS (see all tables at the end of the chapter). When comparing the three direct estimates of abortion rates for the total Matlab area, Johnston found that the AFS generated notably different estimates compared with the DSS or the MDHS. For example, DSS data for 1989–1996 produced a consistent rate of just under five abortions per 1,000 women during this time period, but the MDHS produced a range of rates, from 0.3 abortions per 1,000 women in 1989 to 2.1 in 1993 (not shown). The AFS rates resembled those of the DSS until 1996, when the AFS estimate increased to 14.4 abortions per 1,000 women and ultimately rose to 23.6 abortions per 1,000 women in 1997, when the survey was conducted. The variability in the three direct estimates suggests that none is precise.

However, the high AFS rate of 23.6 per 1,000 women in 1997 is thought to be closest to the true abortion rate. Four major justifications support this thinking. First, the protocol has an abortion-specific focus and was developed and implemented based on lessons learned from previous abortion survey research methodologies and from qualitative research findings on abortion in the Matlab area. In contrast, in the DSS and MDHS, abortion is one of many demographic and health topics covered. Second, respondents are unlikely to overreport stigmatized events such as abortion; support for this comes from informants (who were also DSS respondents) who reported concealing menstrual regulation procedures and abortions in the DSS. Third, the most recent rates of abortion from the AFS (1997) would have been less affected by recall bias, and possibly also by inaccurate reporting, compared with earlier AFS estimates. And fourth, though the AFS rates appear high compared with rates generated by the other direct surveys implemented in Matlab, an annual rate of 23.6 abortions per 1,000 women is just below the range of 26–30 estimated for Bangladesh by Singh and colleagues in 1997 (Singh et al. 1997). This rate is also well within the bounds of rates in other countries that have reputable provider registration systems (e.g., it is virtually identical to the 1990 rate in the United States and Singapore, to name just two) (United Nations 1995).

Moreover, the direct 1997 AFS estimates and the residual estimates based on the 1996 DSS are quite similar for both the total study area and the comparison area, but they diverge for the MCH–FP area. For all three areas, abortion rates calculated from the residual technique based on 1994 MDHS data are much higher than rates derived from the 1997 direct estimates. This finding likely results from the MDHS data underestimating the fertility-reducing effects of delayed marriage and contraceptive use, which shows the method's sensitivity to inaccurate data. For example, for 1994, levels of modern contraceptive use were measured as 14% lower in the MDHS than the DSS for the same population, and the MDHS total fertility rates were 5% higher than the DSS rates. Interestingly, the application of the residual model to 1994 DSS data yielded a negative abortion rate in the MCH–FP intervention area, a clearly erroneous finding very likely caused by overreporting of one of the principal proximate determinants in the DSS.

Johnston concludes that while the residual technique can yield moderately accurate estimates of abortion rates, it is critical that inputs are of high quality because the model is very sensitive to fluctuations in data. Indeed, small variations or inaccuracies in the components of the residual estimation model can cause wide variation in the resulting estimate (see Chapter 4 for more information about the data used in the model). The method is useful in contexts where researchers are confident that the available data are of high quality, but because the indirect residual method yields such varying rates, it is difficult to know if the instances of agreement between the direct

and indirect estimates are a reflection of reality or are due to chance.

Part II. Face-to-Face Interviews vs. ACASI, United States

Diana Lara

As of 1974, the Guttmacher Institute has periodically conducted a survey of abortion providers in the United States to calculate the numbers of abortions and their geographic distribution (Jones 2008). Since 1973, the National Center for Health Statistics has periodically collected data on unintended pregnancy—the demand side of the abortion equation—through the National Surveys of Family Growth (NSFG). Each NSFG collects information from women about their reproductive behavior, including the numbers of unwanted pregnancies and abortions.

To encourage reporting on sensitive issues, the 1995 NSFG introduced an innovative, private self-administered component—ACASI—at the end of the main interview. With the ACASI component, women listened to the questions over audiotape or read them on their computer screen in private, and responded directly by typing answers into a laptop. For this segment of the NSFG interview, women were invited to answer questions on sensitive topics, such as their lifetime experience of abortion, including any abortions that they had already mentioned to an interviewer.

Fu and colleagues (1998) conducted a study to compare the incidence of abortion calculated from the 1995 NSFG—either from face-to-face or self-administered interviews—with the actual incidence of abortion derived from a Guttmacher census of abortion providers who performed abortions between 1991 and 1994. The authors also compared the completeness of abortion reporting in the 1995 NSFG main face-to-face interview against the then new ACASI method.

Unsurprisingly, Fu and colleagues found that the type of data collection approach yielded different abortion estimates. Compared with the number of abortions performed from 1991 to 1994, 45% of actual abortions were reported with NSFG face-to-face interviews, 52% with ACASI and 59% when both methods were combined. The percentage of actual abortions that were reported by each method also varied by women's characteristics: With both interview methods combined, the NSFG captured only 40% of abortions among women below the poverty level but 75% of those among women at ≥200% of poverty. Similar large differentials in reporting completeness emerged by women's age, current marital status and race.

As hypothesized, women in the NSFG generally reported their abortion experience more completely with ACASI than with face-to-face interviews. However, ACASI alone did not yield the fullest count of abortions, as there were some cases where women revealed their abortion history in the face-to-face interview but not in the private, computer-aided interview: Of a total of 3,843 abortions reported by women in the NSFG sample, 58% were reported in both types of interviews, while 15% were reported in the personal interviews only and 27% in the ACASIs only. For the 1991–1994 study period, the inclusion of data collected by ACASI increased the level of abortion reporting across all subgroups (for example, by age, religion and geographic residence). Overall, the level of abortion reporting was 31% higher when the two data sources were combined compared with when only face-to-face data were considered. In sum, the combined findings from both methods yielded a more complete count than did either method alone.

Jones and Kost (2007) conducted a similar study to measure the extent of abortion underreporting in the NSFG by comparing abortion incidence from the Guttmacher survey for 1999–2001 with women's reports from the 2002 NSFG. Of the estimated 6.5 million induced abortions among women aged 15–44 between 1997 and 2001, only 47% (95% confidence interval, 40–55%) of these abortions were reported in the face-to-face interviews of the 2002 NSFG. Like the previous study, the authors found that the ACASI component of the NSFG increased the level of abortion reporting, since 15% more women reported having had an abortion in an ACASI than in a face-to-face interview (1,402 women reported an abortion in a self-administered interview, compared with 1,218 women in a face-to-face interview). This finding led the authors to conclude that most underreporting can be attributed to an unwillingness to acknowledge having had an abortion.

Jones and Kost also examined abortion reporting by length of gestation, a previously unexplored issue. They found that just 37% of abortions that occurred before nine weeks were reported, with the proportion reported increasing with length of gestation. Among second trimester abortions, 85% were reported.

As with the Fu and colleagues study, Jones and Kost found that levels of abortion reporting varied among subgroups of women. As in the 1995 NSFG, Hispanic, black and lower-income women were among the least likely to report their experience of abortion. Abortions among adolescents and women older than age 35 were more likely to be reported, but abortions that women experienced in their 20s were less likely. Married women were also more likely to report abortions. The fact that the same subgroups of women consistently underreported their abortion experience across the two surveys suggests that women's characteristics are reliable predictors of whether they will report having had an abortion.

For both studies that compared NSFG data with external numbers of abortions, the potential limitations of the methodology that generated those external numbers are worth noting. Even though the Guttmacher provider census is considered the most comprehensive source of abortion statistics in the United States, the data are still not totally complete. Guttmacher investigators have calculated a level of abortion underreporting in their provider survey of approximately 3–4% due to a small number of unlisted providers. Other investigators, however, have suggested that the Guttmacher estimates might be inflated because of provider overreporting and because a small proportion of the reported abortions is estimated or projected (Michael 2001).

Both the 1995 and 2002 NSFG surveys found that using a self-administered, private computer-assisted survey increased the reporting of abortions compared with using face-to-face interviews. However, underreporting will always be an issue. As Fu and colleagues noted with their evidence from the 1995 NSFG, apparently not all respondents trust the ACASI method and privacy alone does not ensure that women will be willing to report an abortion. Also, respondents with lower literacy levels or language barriers might face difficulties answering the questions on their own. This reluctance is likely due to the ongoing stigma surrounding abortion, even in legal contexts such as the United States.

However, as was observed in the analysis using the 2002 NSFG, despite supposed greater stigma surrounding second-trimester abortions, such later-term abortions were reported more often than were first-trimester abortions. Jones and Kost suggest that second-trimester procedures, which involve obvious medical intervention, are less likely than earlier abortions to be unreported or denied. Alternatively, second-trimester abortions are usually performed for medical reasons and this in turn suggests that women may be more willing to disclose such medically justified procedures.

Part III. AICM vs. the Residual Technique, Argentina

Siliva Mario and Edith Pantelides

Because induced abortion is severely legally restricted in Argentina, no official records of its practice are available. Faced with this lack of data, Pantelides and Mario used two methods to obtain a range of estimates within which the actual number of abortions could lie (Pantelides and Mario 2007). The best-suited methods to the Argentinean situation are a combination of the AICM developed by Singh and Wulf (1994) and described in Chapter 6, with the residual method reviewed extensively by Johnston and Hill (1996) and described earlier in this chapter and in Chapter 4. Pantelides and Mario used each method to calculate four sets of estimates—two using the AICM (estimates A and B) and two using the residual method (estimates C and D).

For the hospitalization data component needed to apply the AICM, the records of postabortion inpatients in public hospitals for the year 2000 (the most recent available) were used. The two sets of AICM data incorporated different assumptions of the quality of the postabortion hospitalization data. Estimate A assumed that the discharge data were of acceptable quality and did not need to be adjusted, whereas estimate B adjusted them for quality issues, such as the misclassification of induced abortion cases, as suggested by Singh and Wulf (1994). Both estimates, however, adjusted for the omission of private hospitals from official hospital discharge data.

To calculate the total number of abortions occurring in the country, the proportion of abortions that the discharge data represent has to be multiplied by a factor that reflects, among other things, the likelihood that certain types of abortions will lead to complications and the likelihood that women will seek and receive hospital care for them. The data needed for this multiplier came from an HPS, which was implemented between November 2005 and March 2006. A total of 30 interviews were conducted in a range of settings, including the Buenos Aires Metropolitan Area and the cities of Rosario (Santa Fe province), Mendoza (Mendoza province), Córdoba (Córdoba province), Tucumán (Tucumán province) and Resistencia (Chaco province).

A national multiplier was estimated as the weighted average of multipliers that were calculated separately from HPS data for poor and nonpoor women (see Chapter 6), since poor women are more likely than nonpoor women to develop complications, and less likely to seek and receive care for them. The total number of abortions was calculated as the product of the numbers of hospitalized postabortion patients times the multiplier (see Table 2).

For the estimates based on the residual technique, data were obtained from the Encuesta Nacional de Nutrición y Salud, ENNyS (National Survey on Nutrition and Health), which was conducted in 2004–2005 in localities with at least 5,000 inhabitants, and from vital statistics data and population projections. The two sets of estimates generated by the residual technique used different values for the C_i (index of postpartum insusceptibility): Estimate C used the average duration of breastfeeding, whereas Estimate D used the median duration of breastfeeding.

The four estimates of the annual number of induced abortions in Argentina for roughly 2000–2005 (A, B, C and D) range from approximately 372,000 to 522,000, and the abortion rate ranges from 41 to 65 per 1,000 women of re-

productive age. This wide range may be explained by the appropriateness of the methods used and by the quality and availability of the data.

In this example, both estimation methods can potentially underestimate the number of abortions because of biases in the data. For example, the HPS data used to estimate the multiplier were biased by the make-up of the sample, which was predominantly physicians, who tend to overestimate the probability that illegally induced abortions will result in complications requiring hospitalization. Such an overestimate would lower the multiplier (i.e., the lower the multiplier the less safe the conditions of abortion), so the overall number of abortions based on hospitalization data would also be lower.

Furthermore, because a growing number of women are likely incorrectly using misoprostol for self-induced abortions, an unknown number are probably presenting at emergency rooms with bleeding because they have not been properly informed about the drug's normal mechanism of action. Most of these women are treated in the emergency room and thus are not included in the hospital discharge data.

The residual estimation technique may also have yielded underestimates for abortion incidence, as the data used for residual estimation were not nationally representative: The estimate relied on reproductive health data from the ENNyS, which was conducted in localities with at least 5,000 inhabitants. Thus, the number of abortions is limited to these areas, which represent 84% of the total population of Argentina. It would be expected that the total number of induced abortions for the whole country is larger. Moreover, the input data for the contraception index were of moderate quality at best, since country-specific data on contraceptive use–effectiveness for each method were unavailable for Argentina, and researchers had to use standard values from the World Health Organization.

To evaluate which one of the four estimates is closest to the real number of abortions that take place in Argentina each year, we need a sense of where that value currently lies.* Since it is impossible to directly measure the incidence of induced abortion in Argentina, these sets of estimates need to be replicated or another methodology should be tried to determine which result is the most accurate.

Part IV. Comparison of Four Interview Techniques to Measure Abortion Prevalence, Mexico

Diana Lara

In Mexico in a pilot study in 2001, researchers combined four methods to estimate abortion prevalence: face-to-face interviews, ACASI, self-administered questionnaires that were to be placed in a ballot box and RRT (Lara et al. 2004). (For details of the RRT study that resulted from this pilot, see Chapter 5.) The pilot was conducted with the following three populations and settings: 1) convenience sample of 1,480 patients in Mexico City who were recruited in waiting rooms from three public hospitals; 2) convenience sample of 612 women from the rural state of Chiapas who were recruited from adult literacy programs, health care facilities and local markets and parks; and 3) a simple random sample of 1,000 women aged 15–55 who were participating in a household survey in Mexico City. In each setting, participants were randomly assigned to be interviewed using one of the four methodologies.

The face-to-face interviews consisted of 34 questions about women's social, demographic and reproductive characteristics (including their history of unwanted pregnancies, induced abortion attempts and results of those attempts). For the ACASIs, researchers adapted the content and order of questions in the face-to-face interview to make them more compatible with the technology. For the questionnaires used in RRT, researchers eliminated the direct questions about abortion, which resulted in a shorter questionnaire of just 18 items. When women finished filling it out, they were asked the randomized response question using the following procedure: The interviewer held out two folders, one red and one green (with the color coding intended to help low-literacy women). The red folder contained a sheet of paper with a red dot and the question, "Did you ever try to interrupt a pregnancy?" The words "yes" and "no" were printed below the question. The green folder contained a sheet of paper with a green dot and the question, "Were you born in April?" Again, the words "yes" and "no" were printed below.

The interviewer then asked the participant to fold the sheets into the same shape, so it would be impossible to identify one from the other, and place them in an opaque bag. The interviewer shook the bag and asked the woman to pull out one folded sheet of paper. The participant then unfolded her chosen paper and read the question silently to herself. The interviewer did not know which question the participant had chosen to answer. The woman said her answer out loud, either "yes" or "no," and the interviewer recorded the woman's response. This technique

*The only prior estimate of the number of induced abortions in Argentina was calculated for 1991 by Aller Atucha and Pailles. That number ranged between 451,000 and 498,000. However, given the substantial changes in contraceptive method mix and reproductive behavior since then we cannot compare current estimates with the earlier one. (*Source:* Aller Atucha LM and Pailles J, *La práctica del aborto en Argentina: actualización de los estudios realizados, estimación de la magnitud del problema,* Buenos Aires 1996, <http://www.pensamientopenal.com.ar/44aborto.pdf>, accessed Oct. 13, 2009.)

allowed researchers to calculate the proportion of women responding affirmatively to the abortion question using the two known probabilities—that of selecting the sensitive question about abortion (0.5) and that of responding "yes" to having a birthday in April (0.085).

In the two convenience samples, RRT yielded the highest proportion of respondents who reported attempting to interrupt a pregnancy (22% in Mexico City and 36% in Chiapas, respectively) and the self-administered questionnaire yielded the second highest (19% in Mexico City and 10% in Chiapas, respectively) (see Table 3). The last two interview techniques yielded the lowest prevalence in both convenience samples—10–13% with ACASI and 11–12% with face-to-face interviews.

Application of RRT with the Mexico City household sample revealed that 18% of respondents had attempted an abortion, with a 95% confidence interval of 11.2–24.6%. With the self-administered questions, the prevalence was 11%, whereas ACASI and the face-to-face interviews produced abortion-attempt prevalence rates of 9% and 7%, respectively.

In summary, in each of the three samples, RRT obtained the highest prevalence of attempts of induced abortion (22% in the Mexico City hospital sample, 36% in the rural sample and 18% in the Mexico City household sample), followed by the self-administered questionnaire (19%, 10% and 11%, respectively). The ACASI and face-to-face interviews yielded fewer reported abortion attempts. Each of the methods showed strengths and limitations, which are summarized in Table 4.

Chapter Conclusions

The use of data triangulation to estimate and validate abortion prevalence is a useful practice in a variety of legal, social and cultural settings, as demonstrated by the studies described in this chapter. Triangulation helps researchers determine which methodologies yield the most accurate estimates, while it also sheds light on the appropriateness of using certain methods in a given setting or a given population. For example, abortion-specific, face-to-face interviews may yield more accurate estimates of abortion in Bangladesh, but be less effective in countries such as Mexico, where abortion-related stigma and religious opposition to the practice is likely stronger. In addition, the use of complex procedures such as ACASI or RRT among less-educated (or low-literacy) and rural populations may be too confusing, and thus yield less accurate information. Conversely, in the United States, information obtained with ACASI proved more accurate than that obtained through face-to-face interviews.

However, combining face-to-face data with ACASI-collected data yields the most complete measure of abortion prevalence in the United States. The importance of considering both data sources when calculating estimates is clear: Even though larger proportions of abortions were reported using the more confidential technique, some abortions were still reported only in face-to-face interviews.

Although the use of methods that increase anonymity and privacy has improved reporting of abortions, roughly half of abortions still go unreported with direct surveys of women in the United States. In settings where data from abortion providers are unavailable, or where the AICM cannot be used because hospital statistics are of poor quality and a survey to collect these data is not feasible, research will need to rely on data from direct surveys of women. In these situations, efforts need to be made to detect and reduce underreporting as much as possible, for example, through using ACASI or variations on private, direct survey techniques.

The practice of abortion in all parts of the world continues to evolve, and as new technologies influence the safety of abortion and perhaps levels of complications, the use of multiple methods to estimate prevalence and incidence becomes even more critical. For example, we need to better understand the impact of misoprostol on safe abortion incidence and also on possible increases in hospital treatment for postabortion complications among women who are unfamiliar with the way the drug works. In addition, in many relatively unrestricted settings, measures of abortion incidence that are based on official statistics may be incomplete if some providers do not report or provide only partial data to health reporting systems.

Given that abortion is a controversial issue and its incidence and prevalence are difficult to measure and validate, multiple sources of data are needed from more than one estimation technique or method. Combining findings from qualitative, quantitative, direct and indirect methodologies allows researchers to refine estimates and produce more credible findings to serve as critical inputs for reproductive health policies and advocacy strategies.

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TABLE 1: Comparisons of annual .abortion rates derived from direct and indirect estimation techniques, Matlab, Bangladesh

Data source and area	Abortion rate per 1,000 women
Direct 1997 AFS	
Total Matlab study area	23.6
MCH–FP area	9.6
Comparison area	39.6
1994 MDHS	
DIRECT	
Total Matlab study area	1.5
MCH–FP area	u
Comparison area	u
RESIDUAL	
Total Matlab study area	56.3
MCH–FP area	38.0
Comparison area	80.0
1994 DSS	
DIRECT	
Total Matlab study area	4.3
MCH–FP area	2.2
Comparison area	6.8
RESDIUAL	
Total Matlab study area	22.0
MCH–FP area	–3.4
Comparison area	54.9
1996 DSS	
DIRECT	
Total Matlab study area	4.3
MCH–FP area	2.8
Comparison area	6.1
RESIDUAL	
Total Matlab study area	22.0
MCH–FP area	2.0
Comparison area	41.7

u = unavailable. *Source:* Johnston 1999.

TABLE 2: Estimates of the annual number of induced abortions and related indicators according to estimation technique, Argentina, 2000–2005

Method of abortion estimation and individual estimate		Year	No. of induced abortions	Ratio of induced abortions to live births	Induced abortion rate per 1,000 women aged 15–49	Total abortion rate*
AICM	A	2000	446,998	0.64	49.0	u
	B		371,965	0.53	40.8	u
Residual method†	C	2004–2005	485,974	u	60.8	2.13
	D		522,216	u	65.4	2.29

*Average number of lifetime induced abortions per woman that a hypothetical cohort would have, assuming no mortality and no change in age-specific abortion rates.

†Based on women residing in cities of 5,000 inhabitants or more, which represent 84% of the total population and 96% of the urban population of Argentina.

Notes: Estimate A uses unadjusted hospitalization data; B adjusts hospitalization data for the misclassification of induced abortion cases; C uses the average duration of breastfeeding for the index of postpartum insusceptibility; and D uses the median duration of breastfeeding for the index of postpartum insusceptibility. u = unavailable.

Sources: Ministerio de Salud de la Nación, Dirección de Estadísticas de Salud, Serie 5, *Estadísticas vitales, correspondientes al año 2000*, Instituto Nacional de Estadística y Censos (INDEC), population projections and estimates, <www.indec.gov.ar>, accessed Sept. 20, 2006; and Ministerio de Salud de la Nación, Encuesta Nacional de Nutrición y Salud (ENNyS), unpublished tables.

TABLE 3: Proportions of respondents reporting having had an unwanted pregnancy and having attempted an induced abortion in three study populations, by methodology, Mexico, 2001

Sample and outcome	Methodology				
	RRT	SAQ	ACASI	FTF	p-value*
CONVENIENCE					
Mexico City	**(N=370)**	**(N=369)**	**(N=370)**	**(N=371)**	
% had an unwanted pregnancy	38	34	34	34	0.556
% attempted an abortion	22†	19	13	12	0.012
Chiapas	**(N=103)**	**(N=313)‡**	**(N=91)**	**(N=105)**	
% had an unwanted pregnancy	33	27	21	31	0.270
% attempted an abortion	36†	10§	10	11	0.908
HOUSEHOLD (Mexico City)	**(N=250)**	**(N=250)**	**(N=250)**	**(N=250)**	
% had an unwanted pregnancy	27	27	26	26	0.996
% attempted an abortion	18†	11	9	7	0.438

*Based on chi-square analyses conducted between the three direct-question methods only.
†Based on women who answered "yes" to the randomized response question.
‡The N used to calculate rates of attempted abortion in Chiapas was 278 because 35 women did not answer this question and were removed from the sample.
§Includes data from 121 illiterate women for whom the self-administered questionnaire was unsuccessful. When these women are excluded, the proportion reporting having attempted abortion is 12%. Includes data from one woman who did not answer the question on abortion attempts, but indicated to an interviewer as she returned her completed questionnaire that she had had a successful abortion.

Note: RRT = randomized response technique; SAQ = self-administered questionnaire; ACASI = audio computer-assisted self-interview; and FTF = face-to-face interviews.

Source: Lara et al. 2004.

TABLE 4: Strengths and weaknesses of four methodologies for estimating abortion prevalence in Mexico, 2001

Method	Findings	Strengths	Weaknesses
RRT	Highest reported prevalence of unwanted pregnancies and attempted abortions in all study samples	- Very confidential - Appears to overcome women's reluctance to report abortion attempts	- Does not permit analysis of individual responses - Requires twice the sample size to obtain the same power - Does not allow for collection of detailed information about abortion - Questionable reliability and validity among populations of lower education levels
SAQ	Second highest prevalence of unwanted pregnancies and attempted abortions in all study samples	- Less expensive - Confidential - Obtains detailed information about abortion	- High item nonresponse rate - Questionable reliability and validity among populations of lower education levels
ACASI	Low prevalence of attempted abortions in all study samples. High prevalence of unwanted pregnancies	- Confidential - Obtains detailed information about abortion - High item response rate	- Security problems - Expensive - Questionable reliability and validity among populations of lower education levels
FTF	Low prevalence of attempted abortions in all study samples. High prevalence of unwanted pregnancies	- Very detailed information about abortion - High item response rate	- Expensive - Less private - Women's reluctance to report abortion attempts in front of an interviewer

Source: Lara et al. 2004.