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Estimates of the Incidence of Induced Abortion And Consequences of Unsafe Abortion in Senegal

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Abstract

CONTEXT—Abortion is highly restricted by law in Senegal. Although women seek care for abortion complications, no national estimate of abortion incidence exists.

METHODS—Data on postabortion care and abortion in Senegal were collected in 2013 using surveys of a nationally representative sample of 168 health facilities that provide postabortion care and of 110 professionals knowledgeable about abortion service provision. Indirect estimation techniques were applied to the data to estimate the incidence of induced abortion in the country. Abortion rates and ratios were calculated for the nation and separately for the Dakar region and the rest of the country. The distribution of pregnancies by planning status and by outcome was estimated.

RESULTS—In 2012, an estimated 51,500 induced abortions were performed in Senegal, and 16,700 (32%) resulted in complications that were treated at health facilities. The estimated abortion rate was 17 per 1,000 women aged 15–44 and the abortion ratio was 10 per 100 live births. The rate was higher in Dakar (21 per 1,000) than in the rest of the country (16 per 1,000). Poor women were far more likely to experience abortion complications, and less likely to receive treatment for complications, than nonpoor women. About 31% of pregnancies were unintended, and 24% of unintended pregnancies (8% of all pregnancies) ended in abortion.

CONCLUSIONS—Unsafe abortion exacts a heavy toll on women in Senegal. Reducing the barriers to effective contraceptive use and ensuring access to postabortion care without the risk of legal consequences may reduce the incidence of and complications from unsafe abortion.

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Global and regional estimates of abortion incidence indicate that the procedure is no less common in settings with restrictive laws than in those with liberal laws.[1] However, because most illegal abortions are clandestine, studying the circumstances in which abortions are obtained and the consequences of unsafe procedures is difficult in settings with restrictive laws.

In Senegal, abortion is prohibited except to save a woman's life. However, the high level of unmet need for contraception in the country suggests that clandestine abortions do occur.[2] Although the incidence of abortion in Senegal is unknown, one estimate suggests that in West Africa, roughly 28 induced abortions occur annually per 1,000 women of reproductive age.[1]

Policymakers and other stakeholders in Senegal have demonstrated their commitment to improving women's health and reducing maternal mortality in the country. Among the initiatives they have implemented to reduce mortality and morbidity from unsafe abortion are the development of norms and standards for postabortion care, the training of medical and midlevel personnel in the provision of such care and the distribution of equipment needed to perform manual vacuum aspiration (a central component of postabortion care).[3] The postabortion care program was introduced in Senegal in the late 1990s, and by 2006, providers at most public facilities that offer reproductive health services had received training and postabortion care supply kits.

An essential component of further efforts to reduce the incidence and consequences of unsafe abortion is obtaining empirical evidence of the magnitude of the problem. Evidence of this nature can also aid in assessments of the impact of investments aimed at reducing the consequences of unsafe abortion.

The main objective of this study was to estimate the incidence of abortion, and the incidence of complications from unsafe abortion, in Senegal. We calculated estimates not only for Senegal as a whole, but also separately for the Dakar region (where the country's population and health facilities are mostly highly concentrated) and the rest of the country (which is more rural and sparsely populated). In addition, we examined the types of providers and methods that women turn to when they are seeking to terminate a pregnancy, the types of complications that they experience and the proportion of abortion complications that are treated at health care facilities. Finally, we combined the findings from this study with Demographic and Health Survey (DHS) data to estimate the percentage distribution of all pregnancies in Senegal by their planning status and by their outcome.

DATA AND METHODS

Overview

We employed an indirect estimation approach known as the Abortion Incidence Complications Methodology (AICM) for estimating abortion incidence.[4] With this approach, abortion incidence is calculated as the sum of all abortions that resulted in complications treated at health care facilities, those that resulted in complications that were not treated at facilities and those that did not result in complications.

The primary data sources for this study were two surveys: a Health Facilities Survey (HFS), which solicited information on the number of women treated at facilities for abortion complications, and a Health Professionals Survey (HPS), with which we obtained estimates of the proportions of all women obtaining abortions who likely have untreated complications and those who do not have complications. The HPS also solicited information on the types of providers and methods women use to obtain abortions, and on the probability of complications associated with abortions performed by each type of provider. Other sources of information used in the calculations included the 2010–2011 Senegal DHS,[2] and national and regional estimates from National Agency of Statistics and Demography (ANSD) of the number of women of reproductive age and the number of births in the country.[5]

Health Facilities Survey

Medical records regarding follow-up care for an illegal and stigmatized procedure such as induced abortion are likely to be incomplete or inaccurate.[6] Therefore, we surveyed health facilities to obtain this information.

The desired sampling universe for the HFS was all health care facilities staffed and equipped to offer post-abortion care. We obtained a list of all public facilities from the National Office of Health Information Systems at the Ministry of Health and Social Action. The list included hospitals (*établissements publics de santé*, or EPS), which were categorized as district hospitals (EPS1), regional hospitals (EPS2) or teaching hospitals (EPS3); district health centers; and health posts.

Most private clinics are located in the Dakar region. We obtained a list of private clinics in this region from the Dakar Medical Region office and the Ministry of Health's Division of Private Medicine.

Other health care facilities in the country include cabinets (private doctors' offices) and health huts. Cabinets likely treat a very small share of all postabortion care patients; health huts are equipped to provide basic health services and are unlikely to be equipped to provide postabortion care. Lists of these facilities were not available. Thus, our estimates do not account for the small numbers of postabortion care patients who might be treated at these facilities.

Using the lists cited above, we drew up a nationally representative sample of health facilities stratified by administrative zone and facility type. Within each of the country's four zones, we ranked departments (administrative subdivisions) according to the percentage of their residents who lived in urban areas. We selected three departments in each zone: one of the most urban, one of the most rural and one that was intermediate.

All teaching hospitals and regional hospitals in the country were included in the survey, with the exception of military facilities and other facilities that did not offer reproductive health services. Within each chosen department, we selected 100% of health centers, district hospitals and private clinics, and 50% of health posts. We selected every second health post from an alphabetized list. The selected sample consisted of a total of 243 health facilities.

Not all health posts are staffed and equipped to provide postabortion care. If a facility reported that postabortion care was not among the services it offered and that no patients received such care at the facility, it was excluded from the sample. The proportion of health posts in the country that offer postabortion care was assumed to be the same as the proportion that offer postabortion care in the sample, and the number of health posts in the sampling frame was adjusted accordingly.

After we had excluded facilities that were duplicated in the sampling frame, no longer existed, were outside of the sampling zone or did not offer postabortion care, the sample consisted of 172 eligible facilities (Table 1). Four facilities were classified as nonresponders: Staff at two facilities refused to participate, and those at two others could not make time for an interview, despite multiple attempts by the interviewers. Thus, the overall response rate was 98%. The final sample comprised 168 facilities—38 in Dakar and 130 in the rest of Senegal (Appendix Table 1, page 8).

Overall, we sampled 100% of Senegal's regional and national hospitals, 36% of district hospitals and health centers,* 15% of health posts and 57% of private clinics (Table 1). To yield results that were nationally representative for each type of health facility, all analyses used sample weights equal to the inverse of the product of the sampling fraction and the response rate for the facility type.

When arranging interviews with facility staff, interviewers presented a letter of introduction from the Ministry of Health indicating the Ministry's support for the study. They sought interviews with the senior staff member in charge of reproductive health services at each facility, as these individuals were deemed most qualified to answer questions about the postabortion care services offered, and the cases treated, at each facility. When the senior staff member was not available, the interviewer returned at a later date or time. If the respondent still was unavailable, the second most qualified person was identified and interviewed. Most respondents at health centers and hospitals were medical directors, division chiefs or gynecologists; at health posts, the respondent typically was the head midwife or head nurse in charge of the post. On average, respondents had 11 years of professional experience.

Face-to-face interviews were conducted using a structured questionnaire. Among the key data that respondents provided were estimates of the number of patients who received postabortion care as outpatients and the number who received such care as inpatients, both in a typical month and in the most recent month. The estimates for the typical and most recent month were averaged and multiplied by 12 to produce an estimate for the year.

To avoid double counting women who had been referred from one facility to another, we used HFS data from each facility on the number of postabortion care cases referred to another facility for care and the number received from other facilities. Hospitals and health centers most likely receive referrals from lower level facilities and from each other, while health posts and clinics most likely refer women to hospitals and health centers but rarely if

*District hospitals and health centers were examined together because they have similar technical capacities.

ever treat patients referred from other sampled facilities. That is, we expected that all or nearly all out-referrals in the sampling frame were to hospitals and health centers, and that referrals received at health posts came from lower level facilities (health huts and private cabinets) that were not in the sampling frame. To estimate the proportion of women who followed up on referrals, we divided the number of referrals received at hospitals and health centers by the number of cases referred out from all facilities. According to this computation, 72% of all referred cases were treated at a second facility. We therefore subtracted 72% of all out-referrals from each facility's estimated number of cases to avoid double counting.

The number of women treated at each facility for complications of abortion was weighted, and the weighted values for all facilities in the country were summed to obtain estimates of the number of abortions treated in facilities in Senegal as a whole, in the Dakar region and in the rest of the country.

Induced abortions are sometimes classified as spontaneous abortions (miscarriages) to protect women and providers from legal consequences, to avoid broaching the sensitive issue of induced abortion or because the complications of the two types of abortion are not always clinically distinguishable. To avoid misclassification, respondents were asked to include in their estimates patients receiving care for miscarriages as well as those receiving care for induced abortions. The number of miscarriages was deducted from the total as described below.

Identifying the likely number of miscarriages in the reported caseloads entailed two key steps: estimating the incidence of miscarriage in the population and estimating the proportion of miscarriages that were likely to have been treated at facilities.

Miscarriages are most likely to require facility-based care if they occur after the first trimester (i.e., at 13–22 weeks). Clinical studies and life-table analyses suggest that the number of such miscarriages is equal to approximately 3.41% of the number of live births.[7,8] We performed this calculation, separately for Dakar and for the rest of Senegal, using age-specific birthrates from the DHS and age-specific population estimates from the ANSD.

Not all late miscarriages lead to care in a facility; for example, women may not obtain care because they do not need it or because they have limited access to services. We asked HPS respondents to estimate the proportion of late miscarriages that are treated in a facility and used the mean of their responses (79% among respondents in Dakar, 62% among those in the rest of Senegal and 66% for the country as a whole) to estimate the numbers of late miscarriages treated in facilities in Senegal. We subtracted these numbers from the estimated numbers of postabortion care cases to estimate the numbers of women treated for complications of induced abortion.

Health Professionals Survey

Using a structured questionnaire, we conducted face-to-face interviews with a purposive sample of health professionals knowledgeable about abortion provision and women's abortion-seeking behaviors in Senegal. Interviews lasted up to 1.5 hours.

We sought respondents with a range of professional backgrounds and from different parts of the country. The sampling frame was developed through consultation with a broad network of colleagues, including doctors, midwives, nurses, nonformally trained health workers, formally designated community "aunts" (*badiénou gox*), researchers, advocates, program managers and policymakers. We sought to obtain a balanced representation of respondents across professional fields and regions of the country. The response rate was 100%. The final sample consisted of 110 respondents in 10 of the country's 14 regions; 75% were female.

Respondents were asked to provide their perceptions regarding various aspects of induced abortion and its complications in Senegal, including estimates of the frequency of key outcomes. For some of these measures, respondents were asked to make separate estimates for four subgroups: poor urban women, nonpoor urban women, poor rural women and nonpoor rural women.

To obtain information on the types of providers women use, we asked respondents to estimate the proportion of abortions performed by each type of provider among women in each of the four subgroups. For example, we asked: "What percent of all induced abortions in urban areas do you think are being performed by each type of provider for poor women?" In addition, we asked them to estimate, for each type of provider, the probability that women in each subgroup would experience complications requiring medical care. For example, we asked: "Think about poor women in urban areas: Out of 10 women who have an abortion performed by each provider type that I will mention, how many would experience a medical complication that should receive medical treatment?" Using respondents' estimates of the proportion of abortions obtained through each provider type as the weights, we computed the weighted average proportion of abortions that result in complications among women in each subgroup.

Respondents were also asked to estimate, for each subgroup, the probability that a woman with a complication requiring medical care will receive it. For example: "Think about poor women in urban areas: Out of 10 women who experience a medical complication due to an induced abortion, how many do you think would be treated by a trained person in a health facility?" To arrive at an estimate for each subgroup of the proportion of abortions that are treated in health facilities, the proportion of complications treated was multiplied by the proportion of abortions that result in complications.

Using information from the ANSD on the distribution of the population by wealth and place of residence,[9] we then computed a weighted average of the probability a woman who had had an abortion would get treatment at a facility.

Fieldwork

Interviewers were drawn from a pool of professional interviewers with experience in administering surveys in health care facilities. The HFS was administered by 11 interviewers, three of whom were supervisors who also administered the HPS. Training of interviewers took place over five days in April 2013, and fieldwork took place from April to June 2013. Interviewers obtained informed consent from eligible respondents. Confidentiality of respondents was preserved throughout data collection and analysis. The study was approved by the institutional review board at the Guttmacher Institute and by the National Committee of Ethics and Health Research of the Ministry of Health.

Estimates of Abortion Incidence

We estimated the total number of women who had an induced abortion in 2012 (including those who did not experience complications or receive treatment) by multiplying the number of women treated in facilities for complications of induced abortion by the inverse of the probability that women who had had an abortion sought treatment for a complication. We computed separate estimates for the Dakar region and for the rest of the country. Estimates for the Dakar region were based on the information from facilities in the region that participated in the HFS, from experts in the region who participated in the HPS and from population weights for the region (i.e., the distribution of the population by wealth and by urban or rural residence). Estimates for the rest of the country were based on information from the remaining surveys and corresponding population weights. The estimates for these two geographic areas were summed to make estimates for the country as a whole.

We calculated the abortion rate (number of abortions per 1,000 women of reproductive age) and the abortion ratio (number of abortions per 100 live births). The confidence intervals for the estimated numbers of women treated for abortion complications in health facilities were also applied to the abortion rates and ratios.

Distribution of Pregnancies by Planning Status and Outcome

To estimate the percentage distribution of all pregnancies in Senegal by their planning status and outcome, we combined the estimated abortion rate with DHS findings on the distribution of live births by planning status. We assumed that spontaneous pregnancy losses were distributed across planning status in the same way as all pregnancies with known planning status.

RESULTS

Regional hospitals had the largest postabortion care caseloads of all the facilities in the survey. On average, they each received 233 patients with complications of spontaneous or induced abortion in 2012 (Table 2).* District hospitals and health centers received an average of 143 such patients, and referral hospitals saw an average of 87. Private clinics (40 patients each) and health posts (21 patients each) were also sources of care. Of the 168

*Women who were referred to another facility and followed up on the referral were counted as being received at both the referring and the referred facilities.

facilities that participated in the survey, all but seven provided postabortion care in 2012; all of the exceptions were health posts. Respondents' estimates of the number of cases treated at their facility in the past month and the average month and in the past year and average year were internally consistent.

According to the health professionals surveyed, 38% of abortions performed in Senegal in 2012 were done by a traditional practitioner or other untrained provider (Table 3). Another 21% were done by the woman herself and 20% by a nurse or midwife; doctors accounted for only 17%, though they performed a larger share (47%) among nonpoor urban women (not shown). Among poor women in rural and urban areas, doctors performed only 1–2% of all abortions, while untrained providers accounted for 52–53%. An estimated 79% of self-induced abortions and 71% of abortions done by untrained providers resulted in complications (Table 3). Abortions that were done by nurse-midwives and those performed by doctors led to complications in 35% and 22% of cases, respectively.

Health professionals estimated that the majority (73%) of poor rural women who had an induced abortion experienced complications (Figure 1). A similar proportion (69%) of poor urban women who had an abortion experienced complications. However, fewer than half of nonpoor urban and rural women who had an abortion experienced complications (35% and 48%, respectively).

Similar disparities were evident in the estimated proportions of women with abortion complications who received treatment. More than three-quarters of nonpoor women who had complications were thought to have received treatment (86% in urban areas and 76% in rural areas), compared with 53% and 44% of poor women in urban and rural areas, respectively (not shown).

Overall, 30–37% of women who had an abortion were believed to have received treatment for a complication from the procedure (Figure 1). The estimated proportion was lowest for nonpoor urban women (who were the least likely to experience complications) and highest for poor urban women.

From the above data, we estimate that 55% of abortions in Senegal in 2012 resulted in complications. Some 44% of abortions in Dakar resulted in complications, compared with 60% of those in other parts of the country. About 58% of women with complications from an unsafe abortion received medical treatment—64% in Dakar and 57% in the rest of Senegal (not shown).

The mean values of the HPS estimates we used to make the above calculations did not vary substantially according to respondents' sex, general field of work (medical or nonmedical; badiénou gox or other), place of residence (urban or rural) or years of experience (not shown).

To assess the quality of HPS respondents' estimates, we asked them to estimate the proportion of live births in Senegal that occur at facilities, as these answers could be compared with DHS data. The mean of their estimates (70%) closely matched the proportion indicated by the DHS (71%)[10].

Our findings indicate that about 16,700 women received treatment for complications of unsafe abortion in Senegal in 2012 (95% confidence interval, 11,400–22,500; Table 4, page 6). These estimates exclude referral visits and spontaneous abortions treated. Another 12,200 abortions resulted in untreated complications, and 22,600 in no complications. In all, we estimate that women had 51,500 abortions in Senegal in 2012, equivalent to an abortion rate of 17 per 1,000 women aged 15–44 (11–23). The abortion rate in Dakar was 21 per 1,000 (9–34), higher than the rate of 16 per 1,000 in the rest of the country (12–20). The abortion ratio was 10 per 100 live births; again, it was higher in Dakar than in the rest of the country (17 vs. 9).

According to the survey of health professionals, the methods most commonly used to terminate pregnancy in Senegal were drinking caustic agents, such as bleach or detergent; drinking herbal solutions; and surgical procedures, such as manual vacuum aspiration and dilation and curettage (not shown). In general, surgical abortions were thought to be most common among nonpoor urban women (who have better access to doctors and other medical professionals than do other women), while ingesting caustic substances or herbal solutions were most common among poor women and rural women.

The health professionals also reported treating a range of abortion complications. Respondents at 67% of facilities that provided postabortion care said they had treated patients presenting with hemorrhage; 64% had treated patients with incomplete abortion, and 58% had treated patients whose abortions were in progress. Some 16% and 7%, respectively, had encountered cases of shock and sepsis, and 11% reported having treated patients with other complications, such as renal failure or infection.

Finally, we examined the planning status and outcomes of all pregnancies in Senegal. We estimate that 31% of pregnancies in Senegal in 2012 were unintended, and 24% of unintended pregnancies (8% of all pregnancies) ended in induced abortion (Appendix Figure 1, page 8). Another 60% of unintended pregnancies (19% of all pregnancies) resulted in mistimed or unwanted births; 16% ended in miscarriage.

DISCUSSION

This study provides the first national estimate of abortion incidence in Senegal. The data indicate that while the incidence (17 per 1,000) is low in comparison with the estimated rate for the West Africa region (28 per 1,000),[1] more than half of abortions in Senegal result in complications, many of which are not treated.

This study has a few limitations, and we explored whether some of the limitations may have resulted in an underestimate of abortion incidence. As noted, the survey of health facilities did not include private cabinets or health huts. If women receive postabortion care in these facilities, our estimates of the number of women treated and, in turn, of the number who had an abortion are undercounts. However, experts indicate that health huts generally are not equipped to treat abortion complications, and the caseload capacity of private cabinets is small relative to the facilities in the sample.

Second, if we overestimated the proportion of postabortion care cases treated at facilities that were due to miscarriage, then the number of women treated for complications of induced abortion, and thus the abortion rate, was underestimated. The estimated proportion of abortion cases in Senegal that were the result of miscarriage (41%) was higher than that found in many other Sub-Saharan African countries where the AICM has been used, including Malawi (37%),[11] Uganda (23%)[12] and Ethiopia (9%).[13]

Our estimate of the number of postabortion care cases attributed to miscarriage would have been too high if we overestimated the likelihood that women seek care for a miscarriage. In most other countries where the AICM has been used, the proportion of late miscarriages treated in facilities was assumed to equal the proportion of live births that occurred at facilities.* In this study, we instead used HPS respondents' estimates of the proportion of late miscarriages treated. The mean of their responses (66%) was lower than the mean of their estimates of the proportion of live births that take place at a facility (70%),[2] though it was high relative to the estimated proportions treated in the countries noted above (5–59%). The high estimate for Senegal may reflect the quality and relatively high utilization of health care services in the country.

The AICM relies on the assumption that HPS respondents are knowledgeable about the proportion of clandestine abortions that do not result in complications. It is possible that women in Senegal are especially capable of procuring uncomplicated abortions without the knowledge of health professionals, which could explain in part the low estimated abortion rate for Senegal. However, the accuracy of the HPS participants' estimates of the proportion of live births that occurred at facilities suggests that respondents were at least somewhat knowledgeable about the reproductive behaviors of women in the country. On the other hand, assessing behavior related to births is less difficult than assessing behavior about abortion, because the process of seeking care for labor and delivery is not clandestine.

We were able to compute confidence intervals for the estimates of the number of women treated for postabortion care, and we applied these intervals to the estimated abortion rates and ratios. However, confidence intervals could not be readily estimated for multipliers. Essentially, any percentage change in the multiplier would result in the same percentage change in the abortion rate.

Although it is possible that we underestimated the abortion rate in Senegal, the patterns of reproductive behavior documented in the 2010–2011 DHS suggest that the incidence of abortion might, in fact, be low. On average, women in the country reported wanting 3.2 children, but having 5.0. The high level of excess fertility suggests that many unintended pregnancies end in births rather than in abortions. In Dakar, the gap between the total fertility rate (3.7 children per woman) and desired family size (2.4) is smaller than in the rest of the country, consistent with the higher estimated abortion rate in Dakar. The higher prevalence of modern contraceptive use in Dakar (21%) relative to the country as a whole (16%) is unlikely to fully explain the comparatively small gap between desired and actual

*Some studies that used the AICM assumed that the proportion of women who seek care for a miscarriage is larger than the proportion who deliver at a facility.

fertility in Dakar. The estimated abortion rate in Dakar could also be higher than in the rest of the country if women travel to Dakar for abortions or postabortion care.

Implications

The findings from this study have important implications for health policy and service provision. The results indicate that poor women were much more likely than their wealthier peers to suffer the consequences of unsafe abortion. In particular, compared with their nonpoor urban counterparts, poor rural women were twice as likely to experience abortion complications, but about half as likely to receive treatment if they had complications. Since they have an elevated likelihood of experiencing complications, poor women might have a greater risk of being caught for having an illegal abortion and thus of facing legal sanctions, including imprisonment and heavy fines.

Because of the Ministry of Health's efforts, with support from international organizations, Senegal has a fairly well-developed national program for providing postabortion care. A recent assessment of service implementation identified some remaining challenges to the provision of postabortion care (including postabortion family planning services).[14] These challenges include ensuring consistent availability of equipment and supplies, and (in light of staff turnover at facilities) offering ongoing training of providers. The inclusion of postabortion care in the curricula of schools that provide health care training has been recommended as a means of ensuring that all providers have at least basic training in manual vacuum aspiration. The fact that some health posts in the initial sample were not equipped to provide postabortion care, taken together with our finding that many poor and rural women do not receive treatment for their abortion complications, indicates that the Ministry of Health's efforts to expand postabortion care training and provide equipment (particularly at primary-level rural facilities) are worthwhile public health investments.

Even where staff are trained and equipment is available, fear of stigma and of criminal charges still may prevent women from seeking postabortion care when they need it. Indeed, although the law does not require medical providers who treat complications of induced abortion to notify law enforcement officials, evidence indicates that women who arrive for postabortion care are sometimes reported to the police and detained until law enforcement officials arrive.[6]

One tragic outcome of unintended pregnancy in Senegal, documented in the press and known anecdotally, is infanticide. Despite the high level of media attention given to this issue, no scholarly work exists on the incidence of infanticide in Senegal. Empirical evidence of the magnitude of this practice would shed much-needed light on the outcomes of unintended pregnancies in Senegal, as well as on the degree to which infanticide may be a "substitute" for induced abortion among women who cannot terminate their unwanted pregnancies.

Although the level of contraceptive use in Senegal is low (only 16% of married women were using a modern method in 2012),* it has been rising quickly (from 10% in 2005) thanks to efforts by the Ministry of Health to expand access to family planning information and services.[10,15] The decrease in average desired family size (from 4.5 children in 2005 to 3.2

in 2011) indicates that further increases in contraceptive use will be necessary to combat unintended pregnancy, and therefore unsafe abortion, in the years ahead. Some 30% of married women in Senegal have an unmet for a contraceptive method (modern or traditional), a proportion greater than the average of 24% for West Africa.[16] About 25% of women with unmet need in Senegal cite postpartum amenorrhea and breast-feeding as a reason for their nonuse, and 18% cite infrequent sex. Public health campaigns to educate women about their true risk of pregnancy, accompanied by programs targeted to postpartum women that integrate family planning with maternal and child health services, could help speed progress in this area. Opposition to contraception is cited by 23% of women, and concern about health risks or side effects is cited by 14%. However, more than half of women citing these reasons say they intend to use a method in the future, indicating that services will be needed for them at some point. Research to gain a deeper understanding of the bases for these women's opposition, and of their intention to use contraceptives despite their concerns, could inform awareness and education campaigns.

Although legally restricted in Senegal, induced abortion is far from rare, and most procedures are unsafe. Efforts to reduce the incidence of unsafe abortion, to ensure access to postabortion care without risk of recrimination for all women (regardless of wealth or area of residence) and to provide family planning services and programs that address the barriers to contraceptive use can all go a long way toward helping women and couples safely plan their families.

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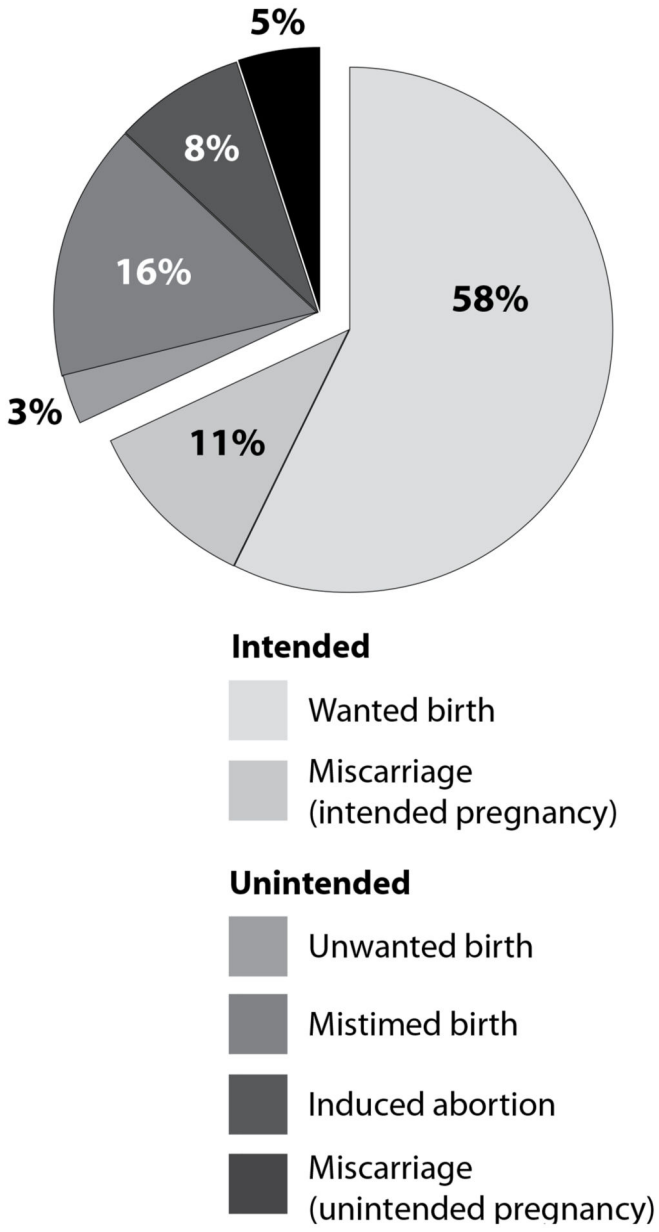
*According to data released just before publication, contraceptive use among married women in Senegal had risen to 20% in 2014, and unmet need had decreased to 25%. Source: Agence Nationale de la Statistique et de la Démographie (ANSD) and ICF International, Senegal Continuous Demographic and Health Survey 2013–14, Dakar, Senegal, and Calverton, MD, USA: ANSD and ICF International, 2015.

APPENDIX



Note: Percentages do not total 100 because of rounding.

APPENDIX FIGURE 1. Estimated percentage distribution of pregnancies, by planning status and outcome, Senegal, 2011–2012

APPENDIX TABLE 1

Measures related to sample selection, by region and facility type, Health Facilities Survey, Senegal, 2012

Region/facility type	No. of facilities likely providing postabortion care	% of facilities sampled	No. of facilities responding	% of facilities responding	Sample weight
DAKAR					
All	**90**	**46**	**38**	**93**	**2.2**
Referral hospital (EPS3)	2	100	2	100	1.0
Regional hospital (EPS2)	3	100	3	100	1.0
District hospital (EPS1)/ health center	21	67	14	100	1.7
Health post	41	20	7	88	5.1
Private clinic	23	61	12	86	1.6
REST OF SENEGAL					
All	**766**	**17**	**130**	**99**	**5.9**
Referral hospital (EPS3)	0	na	na	na	na
Regional hospital (EPS2)	11	100	11	100	1.0
District hospital (EPS1)/ health center	66	26	17	100	3.9
Health post	675	14	96	100	7.0
Private clinic	14	50	6	86	2.3

Notes: EPS=établissements publiques de santé. na=not applicable.

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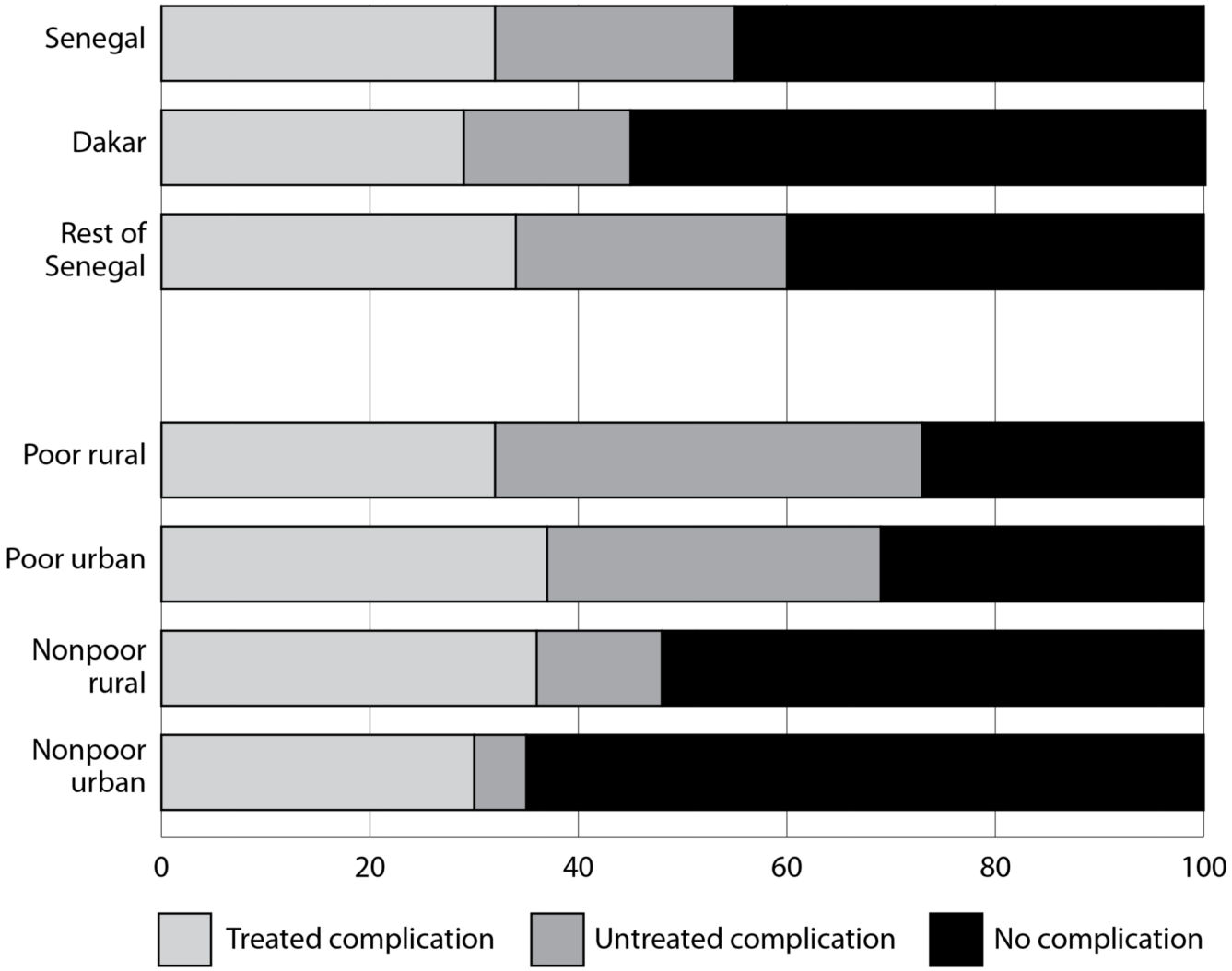

FIGURE 1. Estimated percentage distribution of abortions, by outcome, according to region and women's characteristics, Senegal, 2012

TABLE 1

Measures related to sample selection, by facility type, Health Facilities Survey, Senegal, 2012

Facility type	No. of facilities likely providing postabortion care*	% of facilities sampled	No. of facilities sampled	% of facilities responding	No. of facilities responding
All	**856**	**20**	**172**	**98**	**168**
Referral hospital (EPS3)	2	100	2	100	2
Regional hospital (EPS2)	14	100	14	100	14
District hospital (EPS1)/health center	87	36	31	100	31
Health post	716	15	104	99	103
Private clinic	37	57	21	86	18

*Computed after fieldwork, using information on the proportion of surveyed facilities that provided postabortion care. *Note*: EPS=établissements publiques de santé.

TABLE 2

Estimated mean number of women obtaining postabortion care per facility, by facility type and region, Health Facilities Survey, Senegal, 2012

Facility type	Dakar	Rest of Senegal	All
Referral hospital (EPS3)	87	0	87
Regional hospital (EPS2)	183	247	233
District hospital (EPS1)/health center	143	143	143
Health post	38	20	21
Private clinic	43	33	40

Notes: Includes women seeking care for induced abortion or miscarriage; those who were referred to another facility and followed up on the referral were counted as treated at both the referring and the referred facilities. EPS=établissements publiques de santé.

TABLE 3

Estimated percentage distribution of abortions, and estimated percentage of abortions resulting in complications, by provider type, Health Professionals Survey, Senegal, 2012

Provider type	% of all abortions provided	% of abortions resulting in complications
Untrained provider/ traditional practitioner	38	71
Woman herself	21	79
Nurse/midwife	20	35
Doctor	17	22
Pharmacy	4	52
Total	100	na

Note: na=not applicable.

TABLE 4

Measures used to estimate abortion levels, and key indicators of incidence, all by region, Senegal, 2012

Measure	Dakar	Rest of Senegal	All*
ABORTION OUTCOMES			
No. of women with uncomplicated induced abortions	7,300	15,311	22,611
No. of women with untreated complications of induced abortion	2,042	10,172	12,214
No. of women treated for complications of induced abortion or miscarriage (95% CI)	5,811 (3,623–8,056)	22,418 (19,296–25,980)	28,229 (22,919–34,036)
No. of miscarriages treated in facilities	2,048	9,459	11,507
No. of women treated for complications of induced abortion (95% CI)	3,763 (1,574–6,007)	12,959 (9,837–16,521)	16,722 (11,412–22,529)
Multiplier	3.5	3.0	3.1
No. of induced abortions (95% CI)	13,105 (5,483–20,922)	38,442 (29,182–49,010)	51,547 (34,665–69,932)
DEMOGRAPHIC			
No. of women aged 15–44	615,677	2,429,949	3,045,626
No. of births to women aged 15–44	75,767	445,955	521,722
RATES AND RATIOS			
Abortion rate† (95% CI)	21.3 (8.9–34.0)	15.8 (12.0–20.2)	16.9 (11.4–23.0)
Abortion ratio‡ (95% CI)	17.3 (7.2–27.6)	8.6 (6.5–11.0)	9.9 (6.6–13.4)
Abortion treatment rate§ (95% CI)	6.1 (2.6–9.8)	5.3 (4.0–6.8)	5.5 (3.7–7.4)

Note: CI=confidence interval.

*National estimates of number of women and cases are the sums of the estimates for Dakar and the rest of country.

†Number of abortions per 1,000 women aged 15–44.

‡Number of abortions per 100 live births to women aged 15–44.

§Number of women receiving postabortion care per 1,000 women aged 15–44.