

POST-PARTUM STERILIZATION IN SAO PAULO STATE, BRAZIL

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Summary. This paper examines the accessibility of post-partum sterilization at five hospitals in Campinas, Sao Paulo, Brazil. Of the women who planned sterilization 60% were sterilized. Services were not equally available to all women. While caesarean sections accounted for an extremely high percentage of deliveries at these hospitals, this type of delivery, and concurrent sterilizations, are not equally available to all women who indicated a desire to be sterilized. Since poor women are less likely to have caesarean deliveries, their access to sterilization is limited.

Introduction

Female sterilization is the second most popular contraceptive method in the state of Sao Paulo, Brazil. At the time of a contraceptive prevalence survey in 1978, 63.9% of all currently married women aged 15-44 were using contraception; of these, 25% had been sterilized (Nakamura *et al.*, 1980). Access to sterilization is limited by knowledge of where to obtain services, and this knowledge is positively correlated with education, although education does not affect interest in sterilization (Janowitz *et al.*, 1980).

Although a 1942 law prohibits Brazilian physicians and hospitals from providing information on any treatment that prevents pregnancy or interrupts gestation, the Medical Code of Ethics states that sterilization can be performed under exceptional circumstances after consultation with, and approval by, two physicians (Rodrigues *et al.*, 1975). Legal barriers to sterilization have proved less important in practice than on paper. As with access to other modern methods of family planning—pills, IUDs and condoms—access to sterilization may be limited more by inability to arrange and pay for services than by legal restrictions.

This paper describes and analyses factors affecting planned and actual sterilizations among women in hospital for obstetric deliveries at five hospitals in the city of Campinas, Sao Paulo State. Wherever possible, the data from maternity patients are compared with survey data.

While this analysis relates to hospitals in Campinas, hospital records from Rio de Janeiro show similar patterns of sterilization among obstetric patients in that city, indicating that the problems of access described here may be generalized to other parts of the country.

Data

Sao Paulo is the most developed state in Brazil; it has the highest per capita income, a good highway system and a well-developed communications network (Nakamura *et al.*, 1980). It is an area characterized by declining fertility rates. Like the rest of Brazil, the population of the state of Sao Paulo is overwhelmingly Catholic and becoming increasingly urban (Moreira, da Silva & McLaughlin, 1978). Campinas, a city of approximately 600,000 inhabitants, is estimated to have the highest per capita income in the state of Sao Paulo.

Data on 10,692 women having obstetric deliveries were collected from January 1977 to April 1979 at five hospitals in Campinas. A standard Maternity Record form, devised by the International Fertility Research Program in collaboration with the International Federation of Gynaecology and Obstetrics, was used to record a patient's socio-demographic characteristics, obstetric history, contraceptive practices, antenatal care, management of labour and delivery, maternal and perinatal outcome, and plans for contraceptive use post-partum.

Except for the number of beds, there is little difference in the facilities or services available at each of the five hospitals. There is also little difference in the characteristics of the maternity patients at each hospital.

In this analysis, in testing for association between any two variables, the statistic 'tau c' is used throughout. All relationships that are significant are at the 1% level.

Results

Sterilization plans and implementation

Effects of education and parity. All women were asked how many additional children they wanted. For this analysis, women who want no more children constitute the group who might consider post-partum sterilization as a method of family planning.

Of all the women, 40% wanted no more children (Table 1) and desire for additional children decreased as the woman's level of education increased. This, however, is because the women with less education are of higher parity, and not because education itself is associated with future pregnancy intentions. When parity is controlled, there are few systematic differences in the desire for additional children associated with education, for at any given parity, women within the higher education groups are generally no more likely than women with less education to say they want no more children. For parities of two or more, there is no significant association between education and the desire for no more children. Only a very small proportion of women with one child wanted no more children.

Table 1. Percentage of currently married women aged 15–44 who want no more children, by parity and education: Campinas Maternity Record data

Parity	Education (years)			Total
	<3	3–4	>4	
1	17.6 (165)*	6.2 (1372)	3.7 (1901)	5.4 (3438)
2	56.3 (199)	40.0 (1120)	47.9 (745)	44.4 (2064)
3	82.6 (138)	87.5 (626)	86.4 (301)	86.6 (1065)
≥4	96.0 (272)	95.4 (560)	94.4 (125)	95.4 (957)
Total†	69.5 (863)	44.4 (3813)	26.6 (3122)	40.1 (7798)

* Numbers of cases in parentheses.

† Including women with 0 or unknown parity.

Indeed, among those with one child, education is negatively correlated with the percentage of women desiring no more children and this relationship is significant.

Among maternity patients who wanted no more children, 42% indicated that they planned to be sterilized. There is no significant association between education and sterilization plans (Table 2). By comparison, data obtained from the statewide survey (Nakamura *et al.*, 1980) indicated that 44.4% of women who had all the children they wanted were interested in being sterilized.

Over 60% of maternity patients planning to be sterilized are actually sterilized. Education has a pronounced effect on whether the sterilization takes place. Only 43.4% of women with 3 or fewer years of education were sterilized prior to leaving the hospital compared with 72.3% among women with secondary schooling. Thus, among women who have all the children they want, plans for sterilization are not

Table 2. Sterilization plans and follow-through for currently married women aged 15–44, by education level: Campinas Maternity Record data

	Education (years)			Total
	<3	3–4	>4	
% of maternity patients who want no more children:				
Planning sterilization	43.9 (574)*	40.8 (1655)	43.3 (818)	42.0 (3047)
Actually sterilized	18.3	24.7	30.8	25.1
% of maternity patients planning sterilization who were actually sterilized	43.4 (251)	62.0 (673)	72.3 (354)	61.2 (1278)

* Numbers of cases in parentheses; women with unknown contraceptive plans are excluded.

affected by education, but the percentage of women actually sterilized increases with education. While the percentage of women sterilized is less than that predicted from Nakamura's survey population, the positive correlation is in agreement with that predicted by the survey.

Average parity is higher among women who did not obtain sterilization than among women who did. Since women with the higher levels of education are more likely to be sterilized and since average parity is negatively correlated with education, it is not surprising that the women actually sterilized are of lower average parity (3.76) than those not sterilized (4.85) (Table 3). A *t*-test indicates that these differences are significant except for the age group 20–24.

Table 3. Average parities for currently married women by age and sterilization status: Campinas Maternity Record data and state of Sao Paulo Contraceptive Prevalence Survey (Nakamura *et al.*, 1980)

Age (years)	Average parity		
	Campinas women planning sterilization*		Sao Paulo survey women sterilized postpartum
	Actually sterilized	Not sterilized	
20–24	3.07 (101)†	3.42 (33)	2.56 (21)‡
25–29	3.49 (267)	4.12 (141)	3.73 (76)
30–34	3.76 (226)	4.80 (192)	4.08 (59)
35–39	4.29 (126)	6.19 (81)	4.82 (31)
40–44	5.48 (42)	7.23 (22)	§ (9)
Total	3.76 (762)	4.85 (469)	4.07 (196)

* Including all women who reported that they wanted no more children.

† Numbers of cases in parentheses.

‡ Unweighted numbers.

§ Not calculated if $N < 20$.

The average parity of maternity patients receiving sterilizations compared with that of women in Nakamura's survey who were sterilized post-partum is higher, 4.07 to 3.76, but differences are small.

Effect of age and parity. As expected, the percentage of women wanting no more children is positively correlated with age (Table 4). Only one-quarter of the women aged 20–24 want no more children compared with almost all women aged 40–44. Older women are, of course, likely to be of higher parity than younger women; and controlling for parity reduces, but does not eliminate, the generally positive and significant association between the desire for no more children and age. As women age, caring for a newborn is less acceptable and less appealing.

Table 5 shows that, as expected, among women who do not want any more

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Table 4. Percentage of currently married women aged 15–44 wanting no more children, by age and parity: Campinas Maternity Record data

Parity	Age (years)					
	15–19	20–24	25–29	30–34	35–39	40–44
1	7.0 (795)*	4.7 (1598)	3.2 (817)	10.0 (190)	22.2 (36)	† (2)
2	48.3 (205)	40.7 (838)	41.4 (707)	51.6 (252)	80.0 (60)	† (9)
3	† (19)	79.3 (328)	87.9 (428)	92.3 (221)	98.2 (57)	† (13)
≥4	† (3)	89.0 (136)	95.0 (321)	96.0 (799)	100.0 (145)	100.0 (46)
Total‡	16.6 (1022)	27.8 (2969)	44.7 (2338)	67.5 (1002)	87.4 (340)	98.0 (102)

* Numbers of cases in parentheses.

† Not calculated if $N < 20$.

‡ Including women with 0 or unknown parity.

Table 5. Sterilization plans and follow-through for currently married women aged 15–44, by age: Campinas Maternity Record data

	Age (years)					
	15–19	20–24	25–29	30–34	35–39	40–44
% of maternity patients who want no more children:						
Planning sterilization	1.9 (160)*	17.2 (801)	42.0 (1016)	63.7 (672)	72.6 (292)	67.3 (98)
Actually sterilized	0.6	12.6	26.5	33.9	42.9	42.0
% of maternity patients planning sterilization actually sterilized	† (3)	75.4 (138)	64.8 (426)	53.5 (428)	60.0 (210)	63.6 (66)

* Number: of cases in parentheses; women with unknown contraceptive plans are excluded.

† Not calculated if $N < 20$.

children the percentage planning to be sterilized increases significantly with age. Younger women who do not want additional children are less likely to be interested in a permanent method of contraception. Some young women, therefore, who say they want no more children may mean 'in the foreseeable future' but are not yet ready to take such a final step.

Among those planning sterilization, however, there is an unexpected negative and significant correlation between education and the percentage of women sterilized. Since younger women have had more years of education than older women, this negative correlation may reflect the negative relationship between education and the achievement of sterilization plans in this age group.

There is a positive and significant correlation between age and the percentage of women sterilized among those wanting no more children. Therefore, among all

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women eligible for sterilization, i.e. those wanting no more children, the positive correlation between plans and age outweighs the negative correlation between actualization and age so that overall there is a positive correlation between sterilization and age.

Access to sterilization

Whether a woman carries out her plans to be sterilized depends, in part, upon her ability to work within the organizational constraints of the Brazilian medical care structure to arrange and pay for surgery. There are, basically, three mechanisms of payment in Brazil: (1) private patients pay their own fees; (2) non-private patients are not charged for care; (3) insured patients pay their costs by social or private insurance. 'Insured' is a residual category composed of all women who said they were neither private nor public patients. The reasonableness of the assumption that they are insured patients can be tested by comparing the distribution of patient status for all obstetric patients at one hospital with published information supplied by the hospital for 1978 (Table 6).

Table 6. Comparison of Maternity Record and hospital data on patient status

Status	Maternity Record data %	Published hospital data %
Private	5.1	7.4
Insurance	82.5	83.1
Non-private or free	12.4	9.5

Table 7 shows that private patients are the most likely to be sterilized (87%), followed by insured patients (61%) and non-private patients (39%). These differences are significant at the 1% level.

Payments status is affected by education. Of women with fewer than 3 years of education, less than 1% were private patients, but of women with at least 5 years of education, 22.9% were private patients. The percentage of non-private patients decreases with education: 2 years or less of education, 14%; 3-4 years, 8%; and 5 or more years, 6%. The percentage of women whose care is paid for by insurance is not affected by education.

Interaction between education and payment status does not affect the probability that a woman obtains sterilization. Taken together, education and payment status explain a slight but significant amount of the variance in the percentage of women who are sterilized ($R^2 = 0.06$) with each factor accounting for about half the variance explained. Both financial factors and knowledge of how to make arrangements for surgery are important influences on obtaining sterilization. The role of these two factors requires further study.

Table 7. Percentage of women sterilized among women who want no more children and plan to be sterilized, by patient status and education

Patient status	Education (years)							
	<3		3-4		>4		Total	
	No.*	%	No.	%	No.	%	No.	%
Private	0	†	6	†	81	89	87	87
Insured	215	45	616	64	252	70	1083	61
Not private	36	36	51	41	20	40	107	39
Total	251	43	673	62	353	72	1277	61

* Numbers of cases on which percentages are based.

† Not calculated if $N < 20$.

Following a pattern that seems to be characteristic for Brazil, the rate of caesarean sections at these hospitals is extremely high. More than 40% of all deliveries were by this method, compared with 10–15% at most hospitals in the United States and western Europe. Analysis of recorded medical data on these deliveries indicates that in the Brazilian hospitals a substantial proportion are elective sections at this delivery, or the result of caesarean delivery of a previous pregnancy.

The data from these hospitals show that most women who were sterilized had caesarean deliveries. Of 783 women who are sterilized, 758 (97%) also had caesarean sections. This percentage is markedly higher than in other countries. For example, data from the United States for 1975 indicate that of all sterilizations performed at the time of delivery, only 27% were concurrent with a caesarean section. The probability that a woman who is sterilized also has a caesarean section varies little by education or payment status. Women who are not sterilized have a much lower rate of caesarean deliveries, but sterilizations at delivery are rarely carried out for women with vaginal deliveries. Apparently, a major justification for the high caesarean rate is that they are performed to provide sterilizations.

For women who want no more children, caesarean deliveries appear to be an unnecessarily expensive way to obtain sterilizations. One estimate for Brazil indicates that the difference in price between a caesarean and a vaginal delivery at a private clinic is \$1500 (\$2500 versus \$1000). Assuming that this same differential prevails for all deliveries in Campinas, the additional charge for performing sterilizations concurrently with caesarean sections for all 758 of the sterilized women who had delivered their babies vaginally and were sterilized post-partum may be as high as \$1,137,000 ($758 \times \1500).

While women having vaginal deliveries have a shorter hospital stay than women having abdominal deliveries, the addition of sterilization would be expected to extend the time in hospital for women delivered vaginally more than for women with caesarean deliveries, and this would tend to reduce further the cost differential.

The data for Campinas, however, indicate that, when sterilization is added to delivery, the additional nights required in hospital are about equal for the two types of delivery and do not affect the cost differential.

An interesting question is the extent to which variations in hospital policies may influence whether or not a woman is sterilized. Hospital policies may influence a woman to become interested in sterilization and, if she is interested, affect whether she is actually sterilized. To test for a hospital effect, the women were divided into three groups based on the hospital where the birth took place.

The percentage of women wanting no more children varies by hospital (Table 8), but these differences may be explained by variations in the average number of living children for obstetric patients at the three hospitals. Although the proportion of women reporting that they want no more children is highest at hospital C, so is average family size. The proportion of women reporting that they want no more children is lowest at hospital A, and so is average family size.

Table 8. Selected characteristics related to sterilization among women with obstetric deliveries in three hospitals in the Campinas area

	Hospital		
	A	B	C
% of women who want no more children	47.5 (4998)	49.6 (561)	57.0 (242)
% planning sterilization	47.9 (2313)	26.9 (275)	12.4 (137)
% actually sterilized*	30.1 (2313)	12.4 (275)	10.2 (137)
% of sterilized women who had caesarean sections	98.1 (697)	82.4 (34)	† (14)
% of unsterilized women who had caesarean sections	4.2 (409)	10.3 (39)	† (3)

* Base is women who want no more children.

† Not calculated if $N < 20$.

Among women who want no more children, there are large variations by hospital in the proportions who plan to be sterilized (Table 8). The highest proportion is among those delivering at hospital A and the lowest is at hospital C. Two factors may influence this difference: (1) whether hospital policies and staff actively promote family planning, including sterilization, through such mechanisms as counselling and education programmes; and (2) whether women select hospitals according to their policies on family planning and sterilization. The data available on characteristics of the women provide no insights about why women go to a particular hospital. There may be other factors for which data were not collected that predispose women to deliver in one hospital rather than another. Additional

data need to be collected to determine the influence of hospital policies, staff attitudes and practices and women's preferences on their plans for sterilization. If, as these data strongly suggest, sterilization is available only in conjunction with a caesarean delivery, more information is needed on how women actually go about planning and making the necessary arrangements for a post-partum sterilization.

Conclusions

This paper reports data on maternity patients collected at five hospitals in Campinas, Sao Paulo, to determine the pattern of plans for post-partum sterilization and to identify factors that limit or enhance whether sterilization plans are carried out.

Sixty-one percent of the women in this study who planned sterilization were actually sterilized post-partum, virtually all of the sterilizations being in conjunction with a caesarean delivery. While caesarean sections accounted for an extremely high percentage of deliveries at these hospitals, this type of delivery—and concurrent sterilization—is not equally available to all women who indicated a desire to be sterilized. Whether a woman is actually sterilized is strongly correlated with her level of education and her payment status, suggesting that her knowledge of how to make the necessary arrangements and her ability to pay for services are determining factors. This has the effect of limiting access for those women most in need of sterilization, since poor women with low levels of education are also of highest parity.

Providing sterilization only in conjunction with caesarean delivery is costly, and restricts even further its availability to women who cannot pay for services, either from their own funds or from third party coverage. These costs could be reduced substantially by making sterilizations available with vaginal deliveries.

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