

Monthly

U.S. DEPARTMENT OF  
HEALTH, EDUCATION, AND WELFARE  
Public Health Service  
Health Resources Administration  
5600 Fishers Lane  
Rockville, Maryland 20857



(HRA) 77-1120  
VOL. 26, NO. 3  
SUPPLEMENT  
JUNE 17, 1977

# VITAL STATISTICS REPORT

## *National Natality Survey Data*

FROM THE

NATIONAL CENTER FOR HEALTH STATISTICS

### The Incidence of Sterilization Following Delivery of Legitimate Live Births in Hospitals: United States<sup>a</sup>

An estimated 7.8 percent (220,000) of mothers of 2,818,000 legitimate live births occurring in hospitals in 1972 had sterilizing operations performed which would prevent future pregnancies. This report, based on the 1972 National Natality Survey conducted by the National Center for Health Statistics, also indicates that older mothers, mothers with less education, mothers with unwanted pregnancies, and mothers with more live births are more likely to have undergone such postpartum sterilizing operations.

Recent studies have noted greater acceptance of sterilization. A comparison of the 1965 and 1970 National Fertility Studies conducted by Princeton University has indicated impressive increases in the prevalence of contraceptive sterilization,<sup>1</sup> and shown that contraceptive sterilization has gained increasing attitudinal acceptance by all racial, educational, and religious segments of the population.<sup>2</sup> Provisional data from the 1973 National Survey of Family Growth of the National Center for Health Statistics has indicated continued increases in sterilization.<sup>3</sup> This is the first national data of this type on postpartum sterilization, and more recent information on this topic will not be available from the National Center for Health Statistics before 1980.

This report presents data on postpartum sterilization based on the 1972 National Natality

Survey conducted by the National Center for Health Statistics. A probability sample of 1 in 500 legitimate live births in the United States in 1972 was selected, and the mothers, physicians, and hospitals named on those certificates were "followed back" via a mail survey. The additional social and demographic information provided by mothers and the medical information about the mother and her infant provided by hospitals and physicians were linked with data from the birth certificate in order to expand the scope of information reported on 1972 birth records. The statistics in this report refer to *births* rather than *mothers* since about 2 percent of births are multiple births, i.e., twins, triplets, etc. However, the term "mothers" will be used instead of births since the focus is on sterilization of the mothers. A brief description of the survey methodology, definitions, and tables of sampling errors of the estimates presented in this report appear in the Technical Notes.

#### THE INCIDENCE OF POSTPARTUM STERILIZATION

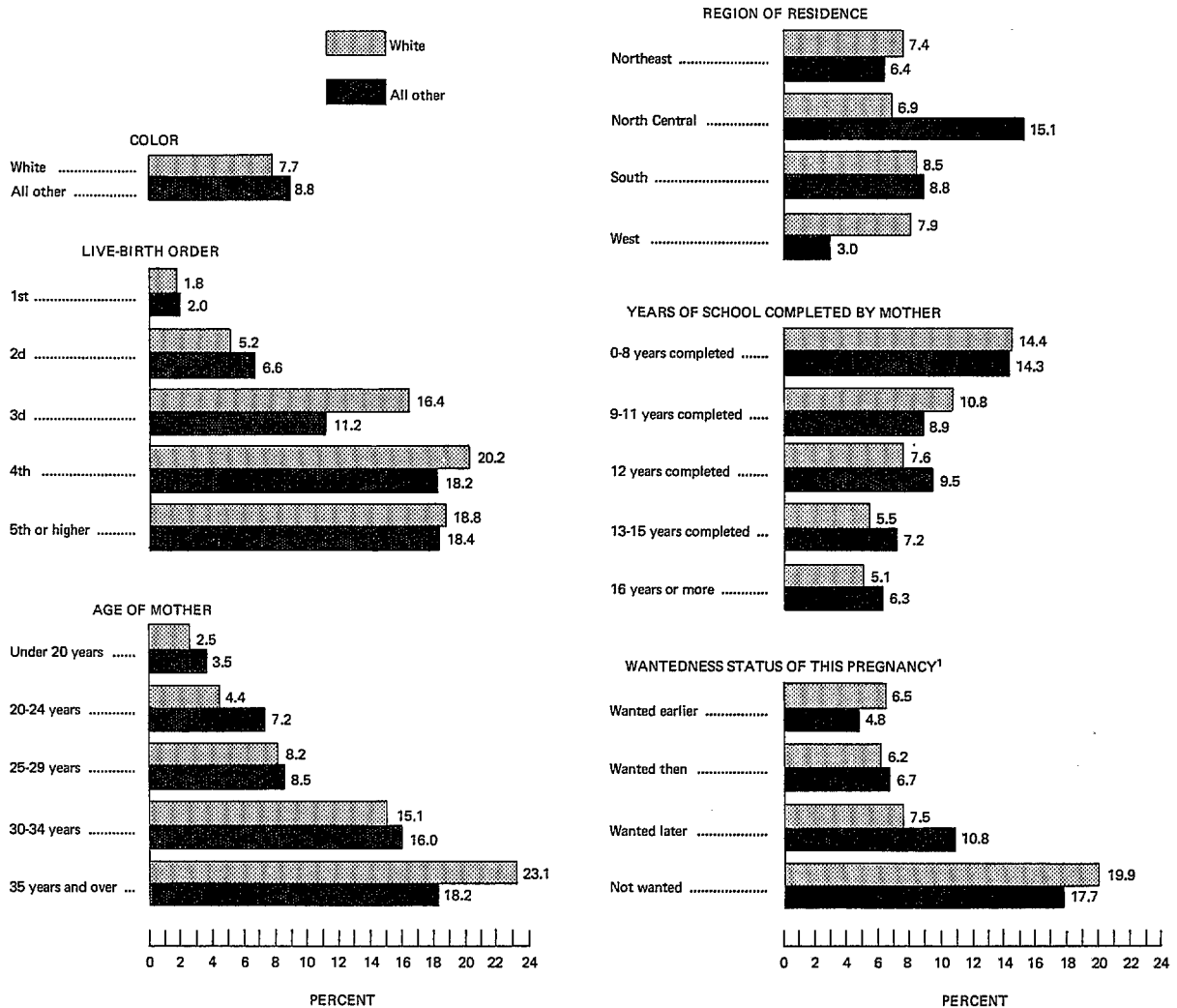
The mail followback questionnaire to hospitals named on the birth certificate asked the question "Was any operation performed which will prevent future pregnancies?" and a "yes" response indicated sterilization for 7.8 percent of mothers of 2,818,000 legitimate live hospital births before the mother left the hospital. Figure

<sup>a</sup>Prepared by Paul J. Placek, Ph.D., Division of Vital Statistics.

1 indicates that at the national level color of mother differs very little with respect to sterilization since 7.7 percent of white mothers and 8.8 percent of mothers of all other races were sterilized, a difference that is not statistically significant. Within regions, however, white mothers were less likely to be sterilized than were mothers of all other races in the North Central Region (6.9 as compared with 15.1 percent) and more likely to be sterilized in the West (7.9 as compared with 3.0 percent).

Mothers with the least education were the most likely and mothers with the most education were the least likely to have had sterilizing operations performed. This relationship holds for all mothers and white mothers, but the difference is not statistically significant for mothers of all other races. Postpartum sterilization was more likely to occur if the pregnancy which ended with the 1972 birth was "not wanted" as compared to "wanted then"; this relationship holds both for white mothers and mothers of all

Figure 1. PERCENT OF MOTHERS STERILIZED FOLLOWING DELIVERY OF LEGITIMATE LIVE HOSPITAL BIRTHS, BY COLOR OF MOTHER, LIVE-BIRTH ORDER, AGE OF MOTHER, REGION OF RESIDENCE, EDUCATIONAL ATTAINMENT OF MOTHER, AND WANTEDNESS STATUS OF THIS PREGNANCY: UNITED STATES, 1972 NATIONAL NATALITY SURVEY



<sup>1</sup> See definition of terms in Technical Notes.

other races. (The wantedness status variable is explained in greater detail in the Technical Notes.)

Increasing age and higher birth order are associated with higher rates of postpartum sterilization for both white and all other mothers, as shown in table 1. For example, only 2.1 percent of white mothers under age 20 having their first child were sterilized, but 21.3 percent of white mothers 35 or over having a fifth or higher order birth were sterilized following delivery in 1972. Older women are more likely to have had all the children they and their husbands want. Furthermore, it is likely that sterilization is frequently obtained by women with repeated contraceptive failures and excess fertility, as well as by women for whom sterilization is advisable for medically remedial reasons. Since older women with more children are more likely to be characterized by these difficulties, it is to be expected that they

would have a higher incidence of sterilization. Younger women with fewer children may have lower rates of sterilization since they may be unwilling to commit themselves to remaining permanently at that parity (i.e., number of children ever born); furthermore, restrictive hospital and physician standards may well discourage the sterilization of low parity women.<sup>1</sup> Mothers of all other races had about the same incidence of sterilization as white mothers within each age and birth order group.

The educational attainment of mothers in the United States is related to postpartum sterilization since 14.4 percent of mothers with 0-8 years of school completed as compared to only 5.3 percent of mothers with 4 or more years of college had a postpartum sterilization operation performed (table 2). This general relationship prevails in all four regions, although in the West it is not statistically significant. Within each ed-

Table 1. Estimated number of legitimate live hospital births and percent of mothers sterilized following delivery, by live-birth order, color, and age of mother: United States, 1972 National Natality Survey

Color and age of mother	Live-birth order						Live-birth order					
	Total	1st	2d	3d	4th	5th or higher	Total	1st	2d	3d	4th	5th or higher
	Number of births in thousands						Percent sterilized					
Total .....	2,818	1,072	869	428	214	236	7.8	1.9	5.3	15.8	19.9	18.7
Under 20 years .....	415	323	82	*9	*2	-	2.7	2.2	3.7	*	*	-
20-24 years .....	1,031	479	384	120	35	13	4.7	1.3	5.1	12.5	12.6	22.5
25-29 years .....	850	215	308	186	86	55	8.2	0.7	4.6	14.5	18.6	19.9
30-34 years .....	356	45	77	83	66	85	15.2	4.6	7.2	21.0	22.5	16.9
35 years and over .....	166	10	19	29	26	82	22.4	28.2	20.5	27.1	26.6	19.2
White .....	2,490	965	781	379	179	186	7.7	1.8	5.2	16.4	20.2	18.8
Under 20 years .....	353	286	61	*6	*0	-	2.5	2.1	3.1	*	*	-
20-24 years .....	915	436	344	102	25	*9	4.4	1.3	4.6	13.3	13.7	*
25-29 years .....	768	196	286	171	73	43	8.2	0.5	4.9	14.8	19.2	19.4
30-34 years .....	311	39	72	75	59	67	15.1	5.3	6.5	21.6	22.4	16.4
35 years and over .....	143	*9	19	26	23	67	23.1	*	20.5	26.4	23.4	21.3
All other .....	328	107	87	49	36	49	8.8	2.0	6.6	11.2	18.2	18.4
Under 20 years .....	62	37	21	*3	*1	-	3.5	2.9	5.4	*	*	-
20-24 years .....	116	43	40	19	10	*4	7.2	1.2	9.3	8.1	10.0	*
25-29 years .....	82	19	21	15	14	13	8.5	2.9	-	10.3	15.4	21.7
30-34 years .....	45	*7	*5	*8	*7	17	16.0	*	*	*	*	18.8
35 years and over .....	23	*2	-	*3	*3	15	18.2	*	-	*	*	10.3

## MONTHLY VITAL STATISTICS REPORT

ucational group in the United States, mothers age 35 and over exhibited a higher incidence of sterilization than mothers under 20 years. However, this difference for women with 0-8 years of school completed is not statistically significant since it is based on small numbers of sample cases. The inverse relationship between educa-

tion and sterilization is observed within each region, although the differences are not always significant.

The rate of sterilization of mothers following an unwanted pregnancy was 2 to 3 times that for mothers whose pregnancy was wanted. Sterilization rates among mothers age 25 and

Table 2. Estimated number of legitimate live hospital births and percent of mothers sterilized following delivery, by age of mother, region of residence, and educational attainment of mother: United States, 1972 National Natality Survey

Region of residence and years of school completed by mother	Age of mother						Age of mother					
	All ages	Under 20 years	20-24 years	25-29 years	30-34 years	35 years and over	All ages	Under 20 years	20-24 years	25-29 years	30-34 years	35 years and over
	Number of births in thousands						Percent sterilized					
United States.....	2,818	415	1,031	850	356	166	7.8	2.7	4.7	8.2	15.2	22.4
0-8 years.....	121	25	39	27	17	14	14.4	10.0	5.1	24.0	18.4	24.5
9-11 years.....	475	126	164	101	54	30	10.5	2.0	7.6	17.7	22.5	16.1
12 years.....	1,348	186	538	384	166	74	7.8	2.4	4.5	7.8	16.1	25.6
13-15 years.....	541	57	212	185	56	30	5.7	1.9	3.7	5.1	11.1	21.0
16 years or more.....	334	21	79	152	63	19	5.3	2.5	1.9	3.6	9.6	20.9
Northeast.....	603	59	214	201	89	40	7.3	2.6	4.5	6.6	8.6	29.3
0-8 years.....	20	*2	*7	*7	*3	*0	14.8	*	*	*	*	*
9-11 years.....	91	16	30	23	12	*8	8.3	3.1	4.8	12.7	5.0	*
12 years.....	294	31	114	86	43	19	7.7	3.3	5.5	6.3	9.3	30.7
13-15 years.....	113	*7	42	42	13	*8	6.4	*	4.6	3.6	7.1	*
16 years or more.....	85	*1	21	42	17	*4	4.2	*	-	4.7	6.1	*
North Central.....	775	107	278	255	88	47	7.6	2.9	4.8	7.5	16.7	18.5
0-8 years.....	24	*6	*6	*5	*3	*5	18.6	*	*	*	*	*
9-11 years.....	113	30	39	24	13	*7	11.3	3.4	10.2	14.2	26.4	*
12 years.....	420	56	164	136	42	22	7.3	2.7	3.6	8.8	16.1	20.1
13-15 years.....	131	*9	50	49	15	*8	5.0	*	5.0	3.1	10.5	*
16 years or more.....	86	*5	18	41	16	*6	5.3	*	2.8	1.2	16.1	*
South.....	940	174	358	244	113	52	8.5	3.2	5.0	9.7	17.4	26.1
0-8 years.....	57	12	20	12	*8	*5	12.3	15.9	5.0	21.8	*	*
9-11 years.....	191	60	67	32	20	11	10.9	0.9	8.9	24.7	24.2	12.7
12 years.....	408	61	171	105	50	21	9.0	2.5	4.9	7.3	24.0	33.8
13-15 years.....	187	31	73	56	16	*10	6.0	3.5	2.7	7.1	10.6	*
16 years or more.....	98	10	27	38	19	*4	4.6	5.0	1.8	3.9	2.7	*
West.....	500	76	180	151	66	27	7.5	1.2	4.1	9.0	18.5	12.3
0-8 years.....	20	*4	*6	*4	*3	*3	14.8	*	*	*	*	*
9-11 years.....	80	20	27	21	*8	*3	10.7	2.2	3.6	16.3	*	*
12 years.....	226	38	88	57	31	12	6.6	1.2	4.5	8.8	13.0	12.4
13-15 years.....	110	*9	47	38	12	*4	5.4	*	3.1	6.6	16.8	*
16 years or more.....	64	*4	13	30	12	*5	7.8	*	3.9	5.0	16.9	*

MONTHLY VITAL STATISTICS REPORT

over were roughly twice as high for mothers of unwanted pregnancies as for mothers of pregnancies which were wanted then or wanted earlier (table 3). These differences for ages 20-24 years are not statistically significant. The incidence of sterilization tends to be low for

mothers under age 20 for all wantedness status categories.

There is little variation in sterilization rates by total family income. It is possible that income is not a very good indicator of socioeconomic position for women in peak childbearing

Table 3. Estimated number of legitimate live hospital births and percent of mothers sterilized following delivery, by total family income, age of mother, and wantedness status of this pregnancy: United States, 1972 National Natality Survey

Age of mother and wantedness status of this pregnancy	All incomes	Total family income					All incomes	Total family income				
		\$3,999 or less	\$4,000-\$6,999	\$7,000-\$9,999	\$10,000-\$14,999	\$15,000 or more		\$3,999 or less	\$4,000-\$6,999	\$7,000-\$9,999	\$10,000-\$14,999	\$15,000 or more
		Number of births in thousands						Percent sterilized				
All ages.....	2,818	296	537	681	818	487	7.8	6.1	7.4	8.8	7.8	7.9
Wanted earlier .....	579	49	99	123	187	121	6.3	5.0	7.2	4.8	7.3	6.1
Wanted then .....	1,241	112	222	309	366	231	6.2	5.5	5.9	6.8	6.0	6.6
Wanted later .....	766	109	180	192	191	94	8.0	6.2	6.1	10.3	8.4	8.0
Not wanted .....	233	26	36	57	74	40	19.6	10.9	24.7	23.2	16.6	21.2
Under 20 years.....	415	95	115	94	73	38	2.7	2.8	2.6	3.1	2.8	1.3
Wanted earlier .....	70	14	16	14	15	11	3.7	-	6.6	3.6	3.3	4.7
Wanted then .....	185	39	51	46	33	16	2.8	5.5	1.0	4.1	1.7	-
Wanted later .....	140	38	43	30	19	*10	2.1	1.4	3.4	1.4	2.3	*
Not wanted .....	20	*4	*5	*3	*7	*1	2.6	*	*	*	*	*
20-24 years.....	1,031	113	227	290	275	126	4.7	4.3	4.3	5.3	4.7	4.2
Wanted earlier .....	202	20	42	52	61	27	3.6	2.5	3.6	1.9	4.7	5.3
Wanted then .....	480	44	98	144	131	63	4.5	2.2	5.0	4.8	4.9	3.8
Wanted later .....	305	44	77	85	69	29	5.2	6.8	2.5	7.5	4.4	5.0
Not wanted .....	44	*5	*10	*9	14	*6	8.0	*	*	*	3.9	*
25-29 years.....	850	49	114	197	305	185	8.2	7.1	9.6	12.0	7.2	5.2
Wanted earlier .....	194	11	23	40	77	43	6.5	13.3	8.8	6.2	5.9	4.8
Wanted then .....	397	18	52	87	140	100	6.3	5.6	8.7	8.8	5.4	4.5
Wanted later .....	197	17	32	53	64	32	10.4	5.9	7.9	17.1	9.4	6.3
Not wanted .....	63	*4	*8	17	24	10	18.2	*	*	26.1	16.5	9.8
30-34 years.....	356	27	53	67	116	93	15.2	17.6	18.5	17.1	14.7	12.0
Wanted earlier .....	80	*2	12	14	25	28	9.9	*	9.7	11.1	15.3	3.7
Wanted then .....	129	*9	13	20	48	39	13.7	*	13.2	17.7	9.3	15.0
Wanted later .....	96	*9	23	20	27	18	17.0	*	22.0	15.4	16.9	11.4
Not wanted .....	51	*6	*6	14	17	*9	24.2	*	*	24.5	25.8	*
35 years and over .....	166	12	27	34	48	45	22.4	20.2	23.0	20.0	20.2	27.0
Wanted earlier .....	33	*1	*7	*3	*9	13	19.1	*	*	*	*	19.1
Wanted then .....	50	*2	*9	12	14	13	15.4	*	*	8.0	20.4	18.6
Wanted later .....	28	*2	*4	*4	12	*5	19.3	*	*	*	15.7	*
Not wanted .....	55	*7	*7	14	13	14	32.3	*	*	30.0	22.6	38.2

## MONTHLY VITAL STATISTICS REPORT

years since young husbands may not have yet reached their income peaks and the birth may have interrupted the mother's employment.

In addition to indicating the inverse relationship between education of mother and sterilization rates discussed earlier, table 4 also shows that within each educational group pregnancies

that were not wanted were about twice as likely to be associated with sterilization as were pregnancies that were wanted then or wanted earlier. However, the differences for mothers with 0-8 years of school completed are not statistically significant. The interval since the last live birth is also related to sterilization; for example, 15.4

Table 4. Estimated number of legitimate live hospital births and percent of mothers sterilized following delivery, by interval since last live birth, educational attainment of mother, and wantedness status of this pregnancy: United States, 1972 National Natality Survey

Years of school completed by mother and wantedness status of this pregnancy	Interval since last live birth					Interval since last live birth						
	Total	23 months or less	24-47 months	48-71 months	72 months or more	No previous live birth	Total	23 months or more	24-47 months	48-71 months	72 months or more	No previous live birth
	Number of births in thousands					Percent sterilized						
Total .....	2,818	687	642	238	208	1,043	7.8	9.1	9.1	12.5	15.4	3.6
Wanted earlier .....	579	76	123	63	59	258	6.3	5.3	9.7	4.7	13.9	3.7
Wanted then .....	1,241	244	326	93	63	515	6.2	8.1	6.0	12.2	11.8	3.7
Wanted later .....	766	290	140	52	28	256	8.0	9.0	10.6	12.7	15.9	3.5
Not wanted .....	233	76	53	31	58	14	19.6	16.4	22.9	28.8	20.6	-
0-8 years.....	121	30	27	12	14	38	14.4	14.6	14.9	20.3	21.6	9.5
Wanted earlier .....	25	*4	*4	*1	*3	12	12.1	*	*	*	*	8.6
Wanted then .....	52	*9	16	*4	*6	18	11.6	*	9.5	*	*	11.8
Wanted later .....	28	11	*5	*3	*1	*8	16.1	21.5	*	*	*	*
Not wanted .....	16	*6	*2	*4	*4	*1	23.8	*	*	*	*	*
9-11 years.....	475	125	92	48	49	161	10.5	10.9	15.6	17.1	14.5	4.0
Wanted earlier .....	83	14	11	12	12	34	8.0	3.5	9.0	12.9	21.7	2.9
Wanted then .....	178	39	37	20	14	68	8.5	8.1	13.0	16.3	7.0	4.4
Wanted later .....	160	56	30	13	*7	54	11.0	11.8	17.3	19.2	*	4.5
Not wanted .....	54	17	13	*4	16	*5	19.0	20.6	25.2	*	16.1	*
12 years.....	1,348	307	300	113	99	530	7.8	9.1	9.2	12.4	16.1	3.7
Wanted earlier .....	281	31	62	31	29	127	6.0	4.9	9.7	3.0	13.9	3.5
Wanted then .....	603	117	146	44	29	267	6.4	8.2	6.1	11.5	13.9	4.1
Wanted later .....	365	136	65	22	11	130	7.6	9.0	10.2	13.6	17.7	3.1
Not wanted .....	99	23	27	15	29	*5	21.6	20.0	22.2	33.5	19.8	*
13-15 years.....	541	170	133	42	28	167	5.7	7.3	6.2	6.3	12.7	2.4
Wanted earlier .....	114	19	28	12	*9	46	4.8	-	10.4	4.5	*	3.2
Wanted then .....	233	57	73	14	*7	81	4.7	8.0	4.0	10.6	*	1.2
Wanted later .....	144	65	25	10	*6	37	5.9	6.8	6.0	-	*	4.1
Not wanted .....	50	28	*7	*6	*5	*4	12.2	12.1	*	*	*	*
16 years or more ...	334	55	90	23	18	147	5.3	7.2	5.0	10.9	13.6	2.7
Wanted earlier .....	77	*8	17	*7	*6	39	5.9	*	5.8	*	*	3.9
Wanted then .....	174	22	54	10	*7	80	3.7	6.5	2.8	9.8	*	2.5
Wanted later .....	70	22	15	*3	*3	27	3.6	2.3	-	*	*	1.9
Not wanted .....	13	*3	*4	*3	*3	*1	30.1	*	*	*	*	*

percent of mothers whose interval since the last live birth was 72 months or more were sterilized as compared to 9.1 percent whose interval was 23 months or less. While this direction of difference exists at all educational levels, statistical significance is not consistently attained.

Since most women prefer to space their pregnancies fairly close together in their earlier years of childbearing,<sup>4</sup> it is likely that many mothers who had a live birth within 47 months before the 1972 birth fell into this category of younger women at lower parities and therefore were less inclined to obtain sterilization. Mothers with longer intervals since the last live birth may have been older, nearer the end of the time when they want to bear additional children, and therefore obtained sterilization in order to permanently stabilize their family size.

In nearly every instance, mothers with no previous live births had lower postpartum sterilization rates than mothers with a previous live birth, regardless of the interval since that birth. Basically, this is a comparison of mothers with one child and mothers with two or more children, and this finding is consistent with the birth order differences shown in table I.

## DISCUSSION

In interpreting the statistics in this report a number of points must be kept in mind. First, the patterns observed here for postpartum sterilization following 2,818,000 legitimate live hospital births may differ from patterns for the approximately 403,000 illegitimate births and the 21,000 nonhospital births which occurred in 1972. Second, sterilization rates presented here are not prevalence rates for all women ever sterilized; rather, they refer only to the incidence of sterilization at time of delivery among women

who had a live birth in 1972. Women sterilized prior to 1972 would not appear in this study of women giving birth. Furthermore, women giving birth in hospitals in 1972 but not sterilized before leaving the hospital might become sterilized later to preclude another pregnancy or subsequent to a future pregnancy. Third, sterilization may be chosen by some of the husbands (i.e., vasectomy) following the conceptions which resulted in 1972 births. Studies indicate that the social and demographic relationships discussed in this report for postpartum sterilization may differ from the relationships for non-postpartum sterilization and for male sterilization.<sup>1</sup> Fourth, sterilization is an area of rapid change, and it has gained in popularity in recent years. Data from the 1973 National Survey of Family Growth indicate that voluntary sterilization—usually tubal ligation for women and vasectomy for men—had become the most popular method of contraception among couples in which the wife was 30-44 years old; 33.8 percent of the couples in this age category practicing contraception had been surgically sterilized.<sup>5</sup> Fifth, it was found that mothers of all other colors had about the same incidence of sterilization as white mothers within each age and birth order group. Since Sly's analysis<sup>6</sup> of census data showed close correspondence between the fertility of white and all other ever-married women, the finding that sterilization rates for white mothers of legitimate births paralleled those for all other mothers at the same age and parity might also be expected. Finally, it should be emphasized that in this survey hospitals were not asked to report the reason for the sterilizing operation, i.e., whether it was primarily remedial (to correct a disease condition of the reproductive system), contraceptive (performed to prevent future childbearing), or both.

## REFERENCES

<sup>1</sup>Bumpass, L. L. and Presser, H. B.: Contraceptive sterilization in the U.S., 1965 and 1970. *Demography* 9(4):531-548, 1972.

<sup>2</sup>Bumpass, L. L. and Presser, H. B.: The increasing acceptance of sterilization and abortion, Chapter 4, in C. F. Westoff et al. *Toward the End of Growth: Population in America*. Englewood Cliffs, N.J. Prentice-Hall, 1973. pp. 33-45.

<sup>3</sup>Pratt, W. F.: *Sterilization in the United States; Preliminary Findings from the National Survey of Family Growth; 1973*. Paper presented at the April 1975 annual meeting of the Population Association of America, Seattle, Washington.

<sup>4</sup>For a detailed discussion of this topic see Trends and differentials in the timing and spacing of births, Chapter 8 in P. K. Whelpton, A. A. Campbell, and J. E.

Patterson, *Fertility and Family Planning in the United States*, Princeton, N.J., Princeton University Press, 1966; and Birth intervals and pregnancy intervals, Chapter 11 in N. B. Ryder and C. F. Westoff, *Reproduction in the United States*, Princeton, N.J., Princeton University Press, 1971.

<sup>5</sup>National Center for Health Statistics: Contraceptive

utilization among currently married women 15-44 years of age, United States, 1973. *Monthly Vital Statistics Report*. Vol. 25, No. 7, Supp. (HRA) 76-1120. Health Resources Administration. Rockville, Md., Oct. 4, 1976.

<sup>6</sup>Sly, D.F.: Minority group status and fertility: An extension of Goldscheider and Uhlenberg, *Am. J. Sociol.* 76(3):443-73, 1970.

### TECHNICAL NOTES

**METHOD AND RESPONSE.** The data presented in this report are based on the 1972 National Natality Survey (or the National Natality Followback Survey as it is often referred to) conducted by the National Center for Health Statistics. The survey was based on a probability sample of 1 in 500 certificates of live birth filed in the United States in 1972. This resulted in a total sample of 6,505 certificates, of which 5,689 were of legitimate births. Births which were reported to be illegitimate ( $N = 555$ ) or inferred to be illegitimate by comparison of names of father, mother, and baby ( $N = 261$ ) were eliminated from this study; this represents approximately 403,000 illegitimate births not studied. Additional information for the 5,689 legitimate live births was obtained from the following sources: (1) All mothers named on the sample certificates were mailed a questionnaire to obtain a complete pregnancy history, household composition, wantedness of the sample birth, expectation of additional births, date of first and present marriage, husband's income, family income, mother's education, father's education, information regarding persons and institutions seen for prenatal care, and proportion of prenatal care, hospital bill, and doctor bill that was paid for by health insurance. (2) If the attending physician and the hospital where the birth occurred had different addresses on the birth certificate, the physician was mailed a questionnaire to obtain information regarding the mother's pregnancy history, visits for prenatal and postpartum care, complications noted during those visits, whether family planning information was given, and the method of contraception the mother may have decided to use. Also, the hospital was mailed a short question-

naire to assess the mother's pregnancy history, her admission and discharge dates, duration of labor, type of delivery, type of anesthetic used, complications of pregnancy and labor, underlying medical conditions of the mother, whether a sterilizing operation was performed, whether the mother was given family planning information, the method of contraception she may have decided to use, condition of infant at delivery, congenital malformations of the infant, birth injuries to the infant, Apgar scores, infant's condition at discharge, and birth weight. (3) If the attending physician and hospital of birth had the same address, the hospital was sent one longer questionnaire which gathered all the information on both the physician and the short hospital questionnaires. (4) If the place of delivery was not a hospital but a physician was the attendant at birth, only the physician questionnaire was mailed. (5) If the birth did not occur in a hospital and was not attended by a physician, only the mother received a questionnaire.

Nonhospital births ( $N = 42$  of 5,689 in the sample, representing 21,000 births nationally) are not included in this report since the hospital questionnaire was the source of information on postpartum sterilization. Estimates in this report refer to all legitimate live hospital births in the United States in 1972 since the data are weighted by means of a poststratified ratio estimation procedure for race, age, and live-birth order.

Response rates to the mailed questionnaires were 71.5 percent from the mothers, 85.4 percent from the hospitals, and 72.2 percent from the physicians. Unit nonresponse (unreturned questionnaires) was treated the same as item nonresponse (some questions left blank on a re-



turned questionnaire), and these values were imputed from a matrix of values appropriate for each birth according to certain social and demographic characteristics.

**RELIABILITY.** The probability design of the survey makes possible the calculation of sampling errors. The standard error is a measure of the sampling variation that occurs by chance because only a sample rather than the entire population of births is surveyed. Approximate standard errors for estimated numbers and percentages in this report are shown in tables I and II, and an example is provided on the method by which significance tests may be conducted. Findings discussed in the text are statistically significant at the 0.05 level with two-tailed normal deviate tests.

Table I. APPROXIMATE STANDARD ERRORS FOR ESTIMATED NUMBERS: 1972 NATIONAL NATALITY SURVEY

Size of estimate	Relative standard error in percent	Standard error
3,000.....	29.2	876
5,000.....	22.6	1,130
10,000.....	16.0	1,600
30,000.....	9.2	2,760
50,000.....	7.1	3,550
70,000.....	6.0	4,200
100,000.....	5.0	5,000
200,000.....	3.4	6,800
500,000.....	2.1	10,500
700,000.....	1.7	11,900
1,000,000.....	1.3	13,000
2,000,000.....	0.6	12,000
2,500,000.....	0.4	10,000

Table II. APPROXIMATE STANDARD ERRORS FOR ESTIMATED PERCENTAGES EXPRESSED IN PERCENTAGE POINTS: 1972 NATIONAL NATALITY SURVEY

Base of percent	2 or 98	5 or 95	10 or 90	20 or 80	30 or 70	40 or 60	50
3,000.....	4.1	6.4	8.8	11.7	13.4	14.3	14.6
5,000.....	3.2	4.9	6.8	9.0	10.4	11.1	11.3
10,000.....	2.2	3.5	4.8	6.4	7.3	7.8	8.0
30,000.....	1.3	2.0	2.8	3.7	4.2	4.5	4.6
50,000.....	1.0	1.6	2.1	2.9	3.3	3.5	3.6
70,000.....	0.8	1.3	1.8	2.4	2.8	3.0	3.0
100,000.....	0.7	1.1	1.5	2.0	2.3	2.5	2.5
200,000.....	0.5	0.8	1.1	1.4	1.6	1.8	1.8
500,000.....	0.3	0.5	0.7	0.9	1.0	1.1	1.1
700,000.....	0.3	0.4	0.6	0.8	0.9	0.9	1.0
1,000,000.....	0.2	0.3	0.5	0.6	0.7	0.8	0.8
2,000,000.....	0.2	0.2	0.3	0.4	0.5	0.6	0.6
2,500,000.....	0.1	0.2	0.3	0.4	0.5	0.5	0.5

*Example:* Suppose that 20 percent of mothers in some category had postpartum sterilizing operations, and the base of that percent is 50,000. The 20 percent column and the 50,000 row indicate that one standard error is 2.9 percentage points, and two standard errors is twice that, or 5.8 percentage points. Therefore, the chances are about 95 out of 100 that this 20.0 percent estimate from the sample differs from the value for the entire population by less than two standard errors, and the percent of mothers in the population who had a postpartum sterilizing operation ranges between 14.2 and 25.8 percent (20.0 percent  $\pm$  5.8 percent). This is a 95 percent confidence interval, and when this interval is found not to overlap with another 95 percent confidence interval which has been similarly calculated, it may be said that the difference is statistically significant at the 0.05 level or beyond. Interpolation may be used for percentages and base numbers which do not closely correspond to the table values shown.

## DEFINITIONS OF TERMS

*Sterilization.*—The fact of sterilization is determined from the hospital questionnaire with a single question: "Was any operation performed which will prevent future pregnancies?"

*Color of mother.*—Color is derived from the birth certificate. "White" includes births to mothers classified as white, Mexican, or Puerto Rican, and "all other" includes Negro, Indian, Chinese, Japanese, Hawaiian, Filipino, Chamorro, and other races.

*Region.*—Region of residence is derived from the birth certificate. Standard classifications of the U.S. Bureau of the Census were used to assign States to the Northeast, North Central, West, and South Regions.

*Education.*—Education of mother is derived from the mother's questionnaire and refers to the highest grade of regular school completed. Trade or business school education is not included.

*Wantedness status.*—Wantedness status is derived from the mother's questionnaire with the question: "Thinking back, *just before you became pregnant* with your new baby, did you want to become pregnant at that time?" Responses were: (1) "I wanted this pregnancy *at an*

*earlier time*, as well as at that time," (2) "I wanted to become pregnant *at that time*," (3) "I did not want to become pregnant at that time, but I wanted another child *sometime in the future*," or (4) "I did not want to become pregnant at that time, or at any time in the future."

*Age.*—Age of mother is derived from the birth certificate and refers to the age at last birthday.

*Income.*—Total family income is derived from the mother's questionnaire and refers to the total income received (before payroll deductions for taxes, bonds, dues, insurance, etc.) by the mother, her husband, and all other family household members from all sources during the 12 months before the baby was born.

*Live birth order.*—Live birth-order (also called "parity") is derived from the birth certificate and refers to the total number of children ever born alive to the mother, including the sample child born in 1972.

*Interval since last live birth.*—Interval since last live birth is derived from the mother's questionnaire by comparing the date of the previous live birth with the date of 1972 live birth.

**SYMBOLS**

Quantity zero -----  
Quantity more than 0 but less than 0.05 — 0.0  
Figure does not meet standards of reliability  
or precision (since the estimate is based on  
less than 20 sample cases) ----- \*