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U.S. Obstetric Procedures, 1998

Sally C. Curtin, MA, and T. J. Mathews, MS

According to the latest birth data from the National Center for Health Statistics, the use of electronic fetal monitoring, ultrasound, stimulation of labor, and induction of labor continued to rise in 1998 to unprecedented levels (1). At the same time, the total cesarean rate, which had fallen each year from 1989 to 1996, rose for the second consecutive year while the primary cesarean rate (rate per 100 births to women with no previous cesarean) rose for the first time during the 1989–1998 period. After increasing by 50 percent between 1989 and 1996, the rate of vaginal birth after previous cesarean (VBAC) declined consecutively in 1997 and 1998. The general pattern during the 1989–1998 period was a decline in births delivered by forceps with a concomitant rise in births delivered by vacuum extraction. However, a slight decline in vacuum-extraction births occurred between 1997 and 1998.

Data Source and Limitations

The birth data in this article are from the National Center for Health Statistics' National Vital Statistics System and are based on 100 percent of the birth certificates for the 50 states and the District of Columbia. All states reported the obstetric procedures and method of delivery items in 1991–1998, except that one category (ultrasound) was not required by Illinois in 1991 and Delaware in 1996. In 1989 and 1990, a few states did not report these items. The footnotes in Table 1 list the state(s) that did not report items for the year. In states that have the items on their birth certificate, the information is sometimes left blank or

is incomplete. For those states that reported obstetric procedures, the completeness of the reporting improved over the period. The percent of records with missing information dropped from 5.5 percent in 1989 to less than 1 percent in 1994–1998. Likewise, for those states that reported method of delivery, the percent of birth records with missing information declined from 4.7 percent in 1989 to less than 1 percent in 1994–1998.

In addition to a lack in completeness of some items, problems with the accuracy of the information can also occur. Studies have shown that obstetric procedures are underreported on the birth certificate, especially induction of labor (2,3). In addition, a study that linked successive birth certificates for mothers in Georgia found that VBACs were underreported on the birth certificate (4).

Obstetric Procedures Increase; Induction More than Doubles

In 1998, 84 percent of women who gave birth had electronic fetal monitoring, a 23-percent increase over 1989 (Table 1). About two-thirds of mothers (65%) had at least one ultrasound examination during pregnancy in 1998, a 36-percent increase over the 1989 level. Whereas the rates of induction and stimulation were much lower than the rates of electronic fetal monitoring and ultrasound, the percent increases were much greater. Induction was used in 19 percent of births in 1998, more than twice the 1989 level of 9 percent. Stimulation was used during labor in 11 percent of births in 1989 and increased to 18 percent in 1998. Altogether, more than one-third of births in 1998 were induced and/or stimulated (37%), including 2 percent of births that were both induced and stimulated.

Induction rates are generally highest for the longest gestational periods but have increased for all gestational groups (Fig. 1; note that Louisiana, Nebraska, and Oklahoma did not report induction in 1989; Oklahoma did not report induction in 1990). A change from 1989 is that the induction rate is now higher for infants of 41 completed weeks' gestation (27%) than for post-term infants of 42 completed weeks or more of gesta-

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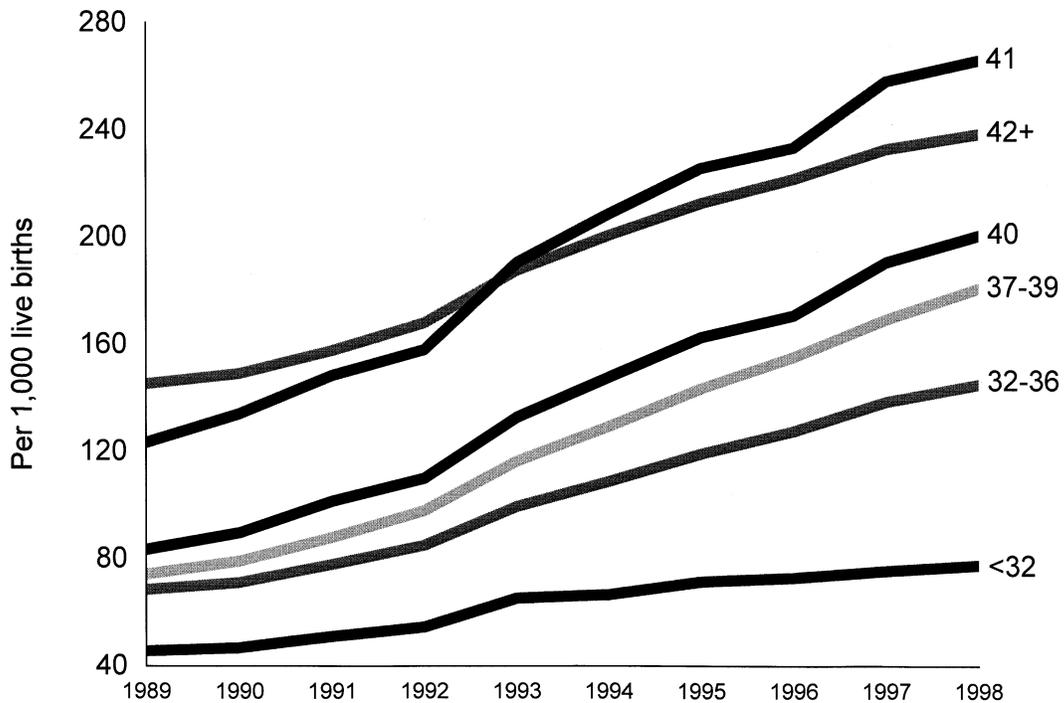


Fig. 1. Rates of induction of labor by length of gestation in weeks: United States, 1989–1998.

tion (24%). The greatest percent increases between 1989 and 1998 in the rates of inductions were for term infants of 37 to 39 and 40 completed weeks' gestation, whose induction rates were 18 and 20 percent, respectively, in 1998. The use of induction also rose for preterm infants—the rate more than doubled for moderately preterm infants (32–36 completed weeks' ges-

tation), to 14 percent in 1998, and rose by 70 percent for infants of less than 32 weeks' gestation.

Cesarean Rate Rises; VBAC Rate Falls

The rate of cesarean delivery increased 2 percent between 1997 and 1998 (from 20.8 per 100 live births

Table 1. Percent of Live Births to Mothers with Selected Obstetric Procedures and Methods of Delivery: United States, 1989–1998

Year	Total No. of Births	Electronic Fetal Monitoring	Ultrasound	Induction of Labor	Stimulation of Labor	Total Cesareans	Primary Cesareans	VBAC ^a	Forceps	Vacuum Extraction
1998	3,941,553	84.0	65.0	19.2	17.8	21.2	14.9	26.3	2.6	6.0
1997	3,880,894	83.3	64.4	18.4	17.4	20.8	14.6	27.4	2.8	6.2
1996	3,891,494	82.5	63.8 ^b	16.9	16.9	20.7	14.6	28.3	3.2	6.2
1995	3,899,589	81.3	61.2	16.0	16.1	20.8	14.7	27.5	3.5	5.9
1994	3,952,767	80.3	61.2	14.7	15.2	21.2	14.9	26.3	3.8	5.7
1993	4,000,240	79.0	60.1	13.4	13.8	21.8	15.3	24.3	4.1	5.3
1992	4,065,014	77.3	57.9	11.4	12.9	22.3	15.6	22.6	4.3	4.8
1991	4,110,907	75.5	56.1 ^c	10.5	12.1	22.6	15.9	21.3	4.6	4.4
1990	4,158,212	73.2 ^d	52.5 ^{c,d}	9.5 ^d	11.4 ^d	22.7 ^e	16.0 ^e	19.9 ^e	5.1 ^e	3.9 ^e
1989	4,040,958	68.4 ^f	47.7 ^{c,f}	9.0 ^f	10.9 ^f	22.8 ^g	16.1 ^g	18.9 ^g	5.5 ^g	3.5 ^g

^a Rate of vaginal birth after previous cesarean.

^b Delaware did not report ultrasound.

^c Illinois did not report ultrasound.

^d Excludes data for Oklahoma, which did not require reporting of obstetric procedures.

^e Excludes data for Oklahoma, which did not require reporting of method of delivery.

^f Excludes data for Louisiana, Nebraska, and Oklahoma, which did not require reporting of obstetric procedures.

^g Excludes data for Louisiana, Maryland, Nebraska, Nevada, and Oklahoma, which did not require reporting of method of delivery.

to 21.2), returning to the level observed in 1994. This was the second consecutive year that the rate increased after falling each year during 1989–1996 (Table 1). The 1998 rate was 7 percent lower than the rate of 22.8 in 1989, the first year this information was available on the birth certificate. The primary cesarean rate in 1998 (14.9 per 100 live births to women who had no previous cesarean) was 2 percent higher than in 1997 (14.6). This was the first time this rate increased during the 1989–1998 period; it declined each year between 1989 and 1996 and remained steady between 1996 and 1997. The primary rate in 1998 was 7 percent lower than in 1989 (16.1), but had returned to the level of 1994. The rate of VBAC declined 4 percent between 1997 and 1998—from 27.4 per 100 women with a previous cesarean to 26.3. The VBAC rate declined 7 percent between 1996 and 1998 after increasing by 50 percent between 1989 and 1996 (from 18.9 to 28.3).

As in past years, cesarean rates in 1998 were highest in the South (22.9), lowest in the Midwest and West (19.3 and 19.7, respectively) and intermediate in the Northeast (21.9). All regions experienced between a 1- and 3-percent increase in their cesarean rate from 1997 to 1998. Considerable variation in cesarean rates occurred by state, ranging from a high of 27.0 in Mississippi to a low of 14.7 in Alaska. There was also considerable variation in VBAC rates by state, from 40.6 in Vermont to 13.1 in Louisiana (1).

All maternal age groups experienced increases in their total cesarean rate between 1997 and 1998, with mothers 25 years of age and over having slightly greater percent increases than younger women (data not shown). In general, cesarean rates are lower for younger mothers and increase with maternal age. VBAC rates declined between 1997 and 1998 for all maternal age groups except for mothers age 40 to 54 years. The rate for these older mothers increased slightly (from 20.5 in 1997 to 20.8 in 1998), but was still the lowest of any group.

Non-Hispanic black women had a higher cesarean rate in 1998 (22.4), than either non-Hispanic white women (21.2), or Hispanic women (20.6). The percent increase between 1997 and 1998 was highest for black women, thus increasing the disparity. Similarly, the primary cesarean rate for non-Hispanic black women

(16.0), was higher than the rate for non-Hispanic white women (15.1), and Hispanic women (13.6). All groups experienced increases in their primary cesarean rate from 1997 to 1998, but the percent increase for non-Hispanic black women was slightly higher than for non-Hispanic white and Hispanic women. The VBAC rate in 1998 was highest for non-Hispanic white women (27.3), lowest for Hispanic women (22.4), and intermediate for non-Hispanic black women (25.7). The VBAC rate for each group declined between 1997 and 1998, with Hispanic women having a slightly greater percent decline than for the other groups.

Use of Vacuum Extraction Replaces Forceps

During the 1989–1998 period, the percent of births that were delivered by either forceps or vacuum extraction remained steady at around 9 percent. During that period, however, a shift occurred as the number and percent of forceps deliveries declined each year while the use of vacuum extraction generally increased (Table 1). In 1998, 2.6 percent of births were forceps deliveries compared with 5.5 percent in 1989—a 53-percent decline. Vacuum extraction was used in 6.0 percent of births in 1998, a slightly lower proportion than in 1997 (2.6), but 71 percent higher than in 1989 (3.5). The slight decline between 1997 and 1998 in the percent of births delivered by vacuum extraction was also apparent when examining vaginal births only—from 7.8 percent of all vaginal births in 1997 to 7.7 percent in 1998.

References

1. Ventura SJ, Martin JA, Curtin SC, Mathews TJ. Births: Final data for 1998. *Natl Vital Stat Rep* 2000;48(3):1–2,13–14,70–74.
2. Piper JM, Mitchel EF, Jr, Snowden M, Hall C, Adams M, Taylor P. Validation of 1989 Tennessee birth certificate using maternal and newborn hospital records. *Am J Epidemiol* 1993; 137:758–768.
3. Buescher PA, Taylor KP, Davis MH, Bowling JM. The quality of the new birth certificate data: A validation study in North Carolina. *Am J Public Health* 1993;83:1163–1165.
4. Green DC, Moore JM, Adams MM, Berg CJ, Wilcox LS, McCarthy BJ. Are we underestimating the rates of vaginal birth after previous cesarean birth? The validity of delivery methods from birth certificates. *Am J Epidemiol* 1998;147: 581–586.