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Out-of-Hospital Births, U.S., 1978: Birth Weight and Apgar Scores as Measures of Outcome

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SYNOPSIS

An examination of 1978 natality data for the United States disclosed that low birth weight was less common among 30,819 infants born out of hospital than among 3,294,101 infants born in hospital in that year. When controls were applied for birth attendant, infants' race, and mothers' education, age, nativity, and parity, the data revealed that white, well-educated women between 25 and 39 years of age, who were having their second babies and were attended by midwives out of hospital, were at least risk of bearing low birth weight infants. The incidence rate of low birth weight babies was lower for midwife-attended births in every category examined. For college-educated white women, for example, the incidence rate was 2.0 percent among those attended by midwives, 4.6 percent among those giving birth in hospital, and 3.6 percent among those whose out-of-hospital deliveries were attended by physicians.

Apgar scores for babies born both in and out of hospital were also studied but, because of inconsistent reporting, were given less attention. Excellent (9–10) Apgar scores were more common among babies born out of hospital than among those born in hospital (63 percent compared with 49 percent), particularly for out-of-hospital births attended by physicians.

At least with respect to birth weight and Apgar scores, the claim that out-of-hospital births are inherently more dangerous than hospital births receives no support from these data. The findings also suggest the need for further refinement of vital statistics categories to permit the analysis of distinctions between births attended by certified nurse-midwives and those attended by lay midwives, as well as differences between births at home and those in alternative birth centers.

THE 40-YEAR MOVEMENT in the United States of place of birth from home to hospital has slowed in the past decade (*1*). Indeed, some States have experienced an increase in out-of-hospital births in recent years (references *2* and *3* and "Distributions of Live Births by Attendant, by Place of Delivery and Race: United States and Each State of Occurrence," an unpublished report of the National Center for Health Statistics).

Decisions by mothers to bear their children out of hospital have sparked controversy among parents, health professionals, and government officials (*4*–

'The risk of having a low birth weight baby seems least for well-educated white women between 25 and 34 years of age, having second children delivered by midwives.'

10). Much of this dispute has focused on comparative safety of hospital and home births. The limited number of studies of this topic that have been carried out have been criticized for their lack of control groups or matched populations (*11*) and their limited samples (*12*).

This study remedies some of these problems by comparing out-of-hospital and in-hospital births recorded in 1978 national natality statistics. Birth outcomes are measured primarily by birth weight; however, there is a secondary examination of Apgar scores. The validity of each variable as a measure of birth outcome will be discussed below.

Methods

The 1978 natality statistics were based on 100 percent of the birth certificates for that year for 36 States that provide data through the Cooperative Health Statistics Systems. The data from the remaining areas (Arizona, Arkansas, California, Connecticut, Delaware, the District of Columbia, Georgia, Hawaii, Mississippi, New Jersey, New Mexico, North Dakota, Pennsylvania, South Dakota, and Wyoming) were based on a 50 percent sample of the birth certificates filed in those areas (*2*). The result is actual birth certificate data on 2.8 million births, representing 86 percent of the 3.3 million live births in the United States in 1978.

This analysis is based on both published and unpublished data compiled by the Natality Statistics Branch of the National Center for Health Statistics; however, the analysis is that of the author and is not the responsibility of NCHS. Since the data are based on such a large sample, they are reported without tests of statistical significance. Because of the size of the data set, even the most minute differences are statistically significant; however, attention in this paper will be focused on the more substantial relationships. The *N*'s reported in the tables vary because some of the variables (for example, mother's education) are not reported by all States.

Out-of-hospital births in this study are primarily home births, but some births in birth centers in particular States are included. After an initial brief description of the population that had out-of-hospital births, this paper focuses on the outcomes of these births. Tables compare total hospital births in 1978 with total out-of-hospital births in that year. Out-of-hospital births are also divided into three categories by attendant: physician, midwife, and "other and unspecified." While the third category is included for the sake of completeness, primary attention is directed to overall differences and to out-of-hospital births attended by physicians and midwives. The study does not include the 1,270 births in 1978 for which the place of birth was not specified.

With the exception of Apgar scores (reported for 67 percent of all births), the natality statistics reported here represent at least 89 percent of all births in the categories of interest: infants' birth weight and race; mothers' age, education, and nativity; and birth order. Inconsistent reporting of Apgar scores, especially in the case of out-of-hospital births (for only 32 percent of which were scores reported), accounts for the secondary attention they receive here.

The 1978 national natality statistics on out-of-hospital births are particularly useful because the data are relatively current, cover every U.S. reporting area (from a low of 36 out-of-hospital births in Delaware to a high of 7,851 in Texas), and provide a sufficient total number of births for which birth weight was recorded (30,819) to permit multivariate cross-tabulations.

There are, of course, difficulties even with these figures. Vital statistics on birth certificates are said to underreport actual out-of-hospital births (*8*), fail to distinguish between planned and unplanned home births (*13*), and may incorporate inconsistencies across States in the reporting of births at birth centers (*14*).

Another problem with the use of birth registrations to study birth outcomes is the lack of a reliable measure of the health of a newborn baby. Retrospective studies of infant mortality and morbidity are one solution to this problem, but they are complex and costly; hence, the samples are usually limited in scope to a hospital or a single State (*11*).

Recent research suggests two more readily available measures of outcome: birth weight and Apgar scores. Birth weight is consistently and reliably reported (*15*), and low birth weight (2,500 gm or less) has been associated with infant mortality

(*16,17*), congenital malformations (*18*), mental retardation (*19*), and other neurological and physical impairments (*20,21*), as well as with lower Apgar scores (*22*). The Apgar score, which ranges from 0 to 10, is a widely used measure of the physical condition of an infant at 1 and 5 minutes after birth. This measure was included on the birth certificates of 39 reporting areas in 1978 and appears to have been reliably recorded (*22,23*). Unfortunately, the reporting of Apgar scores for out-of-hospital births was spotty; several States with a large number of these births did not report Apgar scores at all. Also, variation in the 5-minute scores was quite limited; 89 percent of all babies scored 9 or 10 on that measurement. Therefore, only 1-minute scores are examined here, and these only to a limited extent.

No suggestion is made that either outcome measure examined in this paper is causally related to place of birth, since obviously a birth at a hospital would have no direct impact on an infant's weight. Rather, birth weight and Apgar scores provide researchers with means by which the direct outcome of births on a large scale can be assessed. Linkage studies of neonatal mortality and morbidity rates and place of birth can be more helpful, particularly if a study of every case is made to determine that the site of birth in some way was causally related to the outcome. However, such studies are beyond the scope of most research efforts. Nonetheless, linkage studies and research such as that described here are important starting points in a larger analysis of this important health policy issue.

Results

In an unpublished study (E. Declercq and P. Darney, "A Profile of Out-of-Hospital Births in the U.S., 1978") based on the 1978 national natality statistics, an associate and I examined the characteristics of mothers giving birth out of hospitals. These mothers were typically older, had higher parity, received less prenatal care, and were more likely to be foreign born than mothers bearing children in hospitals. The data also disclosed that physicians and midwives attending out-of-hospital births served slightly different populations. Midwives attended the births of mothers who were older, often were more poorly educated, more frequently lived in rural areas, had higher parity, and received less formal prenatal care than either mothers who had their babies in hospitals or mothers attended by physicians out of hospitals. The impact of these findings on outcomes will be examined in this paper.

'In virtually every instance, babies delivered by midwives out of hospitals were less likely to be of low birth weight than babies in any other group, in or out of hospitals.'

The data presented in table 1 show that babies born out of hospitals usually had higher birth weights than those born in hospitals: 45.1 percent weighed 3,501 gm or more, compared with 38.7 percent of babies born in hospitals. Infants at greatest risk are those weighing 2,500 gm or less, and again the overall differences slightly favored out-of-hospital births. It was only among births attended by midwives that the proportion of low birth weight infants was less than that among babies born in hospitals, but the difference was so pronounced that it offset the other two out-of-hospital categories.

Table 1. Percentage distribution of live births, United States, 1978, by birth weight, place of birth, and attendant

Weight (grams)	Hospital (N = 3,294,101)	Out of hospital			
		Total (N = 30,819)	Physician (N = 10,991)	Midwife (N = 9,603)	Other and unspecified (N = 10,225)
2,500 or less	7.1	6.9	8.6	4.2	7.6
2,501–3,500	54.2	48.0	50.4	46.2	47.2
3,501–4,500	36.9	41.7	38.5	45.2	41.9
4,501 or more	1.8	3.4	2.6	4.4	3.2
Total	100.0	100.0	[1]100.1	100.0	[1]99.9

[1] Totals do not equal 100 because of rounding.
NOTE: *N* represents births for which birth weight was recorded.

SOURCE: Reference 2 and unpublished data from the National Center for Health Statistics.

Table 2 presents a comparison of 1-minute Apgar scores. Babies scoring 7 or higher by this measurement are considered to be in good to excellent condition. In this study, differences with respect to scores of 7 or higher slightly favored births in hospitals. However, babies born out of hospitals were distinctly more likely to receive excellent (9–10) Apgar scores than those born in hospitals; indeed, two-thirds of the babies delivered at home by physicians had scores in this category. The slightly bimodal distribution for births out of hospital is reflected in table 2 in the marginally higher proportion of babies born with dangerously low (0–3) Apgar scores. This finding may be the result of a concentration of unplanned, out-of-hospital births in the low category and planned, prepared-for births in the higher category. To analyze further the impact of factors such as infants' race and mothers' education, parity, and nativity, in this study I examined birth weight and Apgar scores while controlling for those variables.

Low birth weight. An exhaustive study of the variables associated with low birth weight showed socioeconomic status, as measured by mothers' educational attainment, to be a crucial factor. Birth weight also varied by infants' race and mothers' age, marital status, place of residence, nativity, and pregnancy history (*15*).

Table 3 examines the relationship between education of the mother and the incidence of low birth weight infants. In an effort to keep multivariate tables manageable, the percentage of low birth weight babies is used as the dependent variable in subsequent analysis.

While birth weight was recorded on all birth certificates, education was not; therefore, 8,477

Table 2. Percentage distribution of 1-minute Apgar scores for infants born in the United States, 1978, by place of birth and attendant

Apgar score	Hospital (N = 2,333,432)	Out of hospital			
		Total (N = 10,151)	Physician (N = 5,568)	Midwife (N = 2,189)	Other and unspecified (N = 2,394)
0–3	2.2	2.9	2.7	3.1	3.3
4–6	7.0	7.4	6.0	11.0	7.3
7–8	41.8	27.2	24.7	29.4	31.3
9–10	49.0	62.5	66.7	56.5	57.9
Total	100.0	100.0	[1]100.1	100.0	[1]99.8
Less than 7	9.2	10.3	8.7	14.1	10.6
7 or higher	90.8	89.7	91.3	85.9	89.4
Total	100.0	100.0	100.0	100.0	100.0

[1] Totals do not equal 100 because of rounding.
NOTE: *N* represents births for which Apgar scores were reported.
SOURCE: Reference 2 and unpublished data from the National Center for Health Statistics.

Table 3. Percentage of low birth weight infants[1] among live births in the United States, 1978, by mothers' education, place of birth, and attendant

Education (years)	Hospital (N = 2,945,446)	Out of hospital			
		Total (N = 22,342)	Physician (N = 9,539)	Midwife (N = 4,404)	Other and unspecified (N = 8,399)
0–8	8.6	8.9	10.0	6.3	9.6
9–11	10.0	11.7	13.3	6.1	13.9
12	6.7	7.7	9.6	3.8	7.5
13 and above	5.3	4.1	4.4	2.4	4.4
All educational levels	7.1	7.4	8.7	4.3	7.5

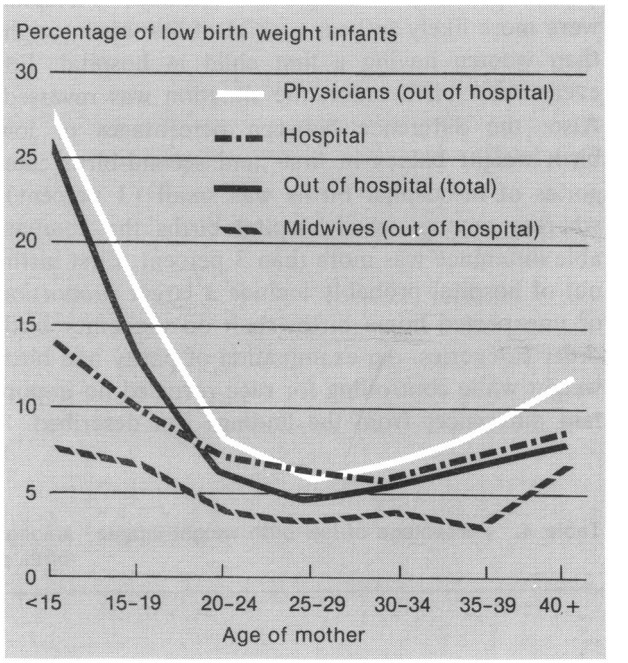
[1] Infants weighing 2,500 gm or less at birth.
NOTE: *N* represents births for which both birth weight and mother's education were reported.
SOURCE: National Center for Health Statistics: Vital Statistics of the United States, 1978, Vol. 1, Natality, and unpublished data.

additional cases were lost from the out-of-hospital data and 348,655 more cases from the hospital statistics. This loss resulted in a change in the overall figures: remaining out-of-hospital births had a total percentage of low birth weight infants of 7.4, compared with 6.9 for the complete out-of-hospital population. This change is largely the result of the loss from the out-of-hospital group of many Mexican mothers from Texas, who typically have infants with higher birth weights than the population as a whole (*24*).

As table 3 shows, the pattern for both in-hospital and out-of-hospital deliveries was the same: the incidence of low birth weight infants was greatest among mothers with some high school education, decreasing among those with further education. The differences between in-hospital and out-of-hospital groups, however, were striking. In the three lowest educational categories (0–12 years of school completed), the percentage of low birth weight infants was consistently higher among babies born out of hospitals, as a combined group. But among those women with at least some college education, the percentage of low birth weight babies among those born out of hospital was lower. Once again, among women in all groups whose babies were delivered by midwives, the incidence of low birth weight babies was strikingly lower than that among women whose babies were born in hospital; in fact, in the case of well-educated mothers the rate (2.4 percent) was less than one-half that for in-hospital births to mothers with similar education (5.3 percent). Even among women with less education, births attended by midwives resulted in smaller percentages of low birth weight infants than births in hospitals. While the data do not permit us to distinguish planned out-of-hospital births from those that are unplanned, it would seem likely that most out-of-hospital births to college-educated women were planned, and the results, at least in terms of birth weight, were generally positive. Planning status and self-selection likely account for some of the higher birth weights for babies of mothers attended by midwives; however, since midwives do not attend a disproportionate number of well-educated mothers (Declercq and Darney, "Profile of Out-of-Hospital Births in the U.S., 1978"), self-selection alone does not appear to explain the results completely.

Age. A similar pattern emerges with respect to age (see figure). Women in the highest risk groupings (< 20 years) were less likely to have a low birth weight infant if the birth occurred in a hospital.

Percentage of low birth weight infants[1] by age of mother, place of delivery, and attendant



[1] Infants weighing 2,500 gm or less.

However, in every other age category, low birth weight was more common among hospital births.

The most striking findings were the outcomes of midwife-attended births. In every mothers' age group, babies delivered by midwives were less likely to be of low birth weight. It is safe to say that few teenagers plan an attended home or birth-center birth; hence, the age categories under 20 years likely included many unplanned deliveries. The use of a midwife would typically involve at least some planning, whereas some of the physician-attended births in this category likely were emergencies.

When both age and education were controlled for, both variables were found to have an independent, nonlinear influence on birth weight: babies born to college-educated women between 30 and 34 years of age in out-of-hospital deliveries were at least risk of being low birth weight infants.

Parity. In this study, almost 43 percent of those women bearing children in a hospital were having their first baby, compared with only 29 percent of those who gave birth out of hospital. This notable difference helps explain why there was little overall difference in the percentages of low birth weight infants among live births in hospital and out of hospital (7.1 percent versus 6.9 percent), although

there were larger differences within each parity level (table 4). Women having a first child out of hospital were more likely to bear a child of low birth weight than women having a first child in hospital. For every other birth order, the situation was reversed. Also, the difference between percentages of low birth weight babies in first- and second-birth categories of in-hospital births was small (1 percent). whereas among out-of-hospital births the comparable difference was more than 3 percent. First births out of hospital probably include a larger proportion of unexpected home births than do the other birth order categories. An examination of parity and birth weight while controlling for race revealed no important differences from the findings just described.

Thus far, the data indicate that multiparous, well-educated women between 25 and 34, giving birth out of hospital, are not at greater risk of having a low birth weight baby than women giving birth in a hospital. Perhaps a closer look at race and nativity can clarify the picture further.

Race and nativity. In the early part of the 20th century, the movement of birth site from home to hospital was slowest among immigrant women (*25*). Even at present, foreign-born mothers are much more likely to have a home birth (1.5 percent of all births) than native-born women (0.9 percent) (Declercq and Darney, "A Profile of Out-of-Hospital Births in the U.S., 1978").

Table 4. Percentage of low birth weight infants [1] among live births in the United States, 1978, by birth order, place of birth, and attendant

Birth order	Hospital (N = 3,263,805)	Out of hospital			
		Total (N = 30,389)	Physician (N = 10,883)	Midwife (N = 9,504)	Other and unspecified (N = 10,002)
First	7.4	9.0	10.2	5.2	10.8
Second	6.4	5.8	7.6	3.3	6.0
Third	7.0	5.8	8.4	3.7	5.3
Fourth	7.8	6.2	7.7	4.0	7.0
Fifth and above	8.7	6.7	7.2	4.7	8.9
All birth orders	7.1	6.9	8.5	4.2	7.7

[1] Infants weighing 2,500 gm or less at birth.
NOTE: *N* represents births for which both birth weight and birth order were reported.
SOURCE: National Center for Health Statistics: Vital Statistics of the United States, 1978, Vol. 1, Natality, and unpublished data.

Table 5. Percentage of low birth weight infants [1] among live births in the United States, 1978, by infants' race, mothers' nativity, place of birth, and attendant

Variable	Hospital	Out of hospital			
		Total	Physician	Midwife	Other and unspecified
Race:					
White	5.9	5.3	6.4	3.3	6.1
Black	12.9	13.8	16.1	7.6	20.6
Other nonwhite	6.8	11.9	16.0	6.3	11.1
Number	*3,294,091*	*30,819*	*10,991*	*9,603*	*10,225*
Nativity:					
Native born	7.2	7.2	8.6	4.5	7.7
Foreign born	6.1	4.9	7.2	3.4	7.5
Mexican	5.3	4.7	8.2	3.3	10.1
Other foreign born	6.1	5.2	6.2	3.5	5.2
Number [2]	*3,290,145*	*30,734*	*10,953*	*9,588*	*10,193*

[1] Infants weighing 2,500 gm or less at birth.
[2] Number of births for which mother's nativity was recorded.
SOURCE: For race, reference *2* and unpublished data from the National Center for Health Statistics. For nativity, unpublished data from NCHS.

Among the subjects of this study, how did nativity influence birth weight? The percentage of low birth weight babies born to native-born mothers was the same for both in-hospital and out-of-hospital births (table 5). There was a clear difference, however, in the case of foreign-born mothers. Of greatest interest, perhaps, were Mexican mothers, whose babies have higher birth weights than the national average, regardless of birth site. The large number of out-of-hospital deliveries among Mexican women accounts in part for the lower incidence of low birth weight for out-of-hospital births, as seen in tables 1 and 5. Even among these mothers, however, the pattern seen earlier emerged: out-of-hospital births fared better, essentially because an unusually small percentage (3.3 percent) of the infants delivered by midwives were of low birth weight.

In the 1978 national natality statistics, the proportions of black and white infants born out of hospital were exactly the same (0.9 percent) (Declercq and Darney, "A Profile of Out-of-Hospital Births in the U.S., 1978"). However, black infants were more frequently of low birth weight than white infants, and this was true of babies born both in and out of hospital (table 5). The racial differences in percentages of low birth weight infants were more pronounced for out-of-hospital births (8.5 percentage points) than for in-hospital deliveries (7.0 percentage points). Also, among blacks, low birth weight was slightly more common for babies born out of hospital than for those born in hospital, but the reverse was true for whites. This difference may have been due to a greater concentration, among blacks, of women of lower socioeconomic status—some of whom may have given birth out of hospital because of limited access to such a facility. The best test available for this hypothesis is to examine education and race jointly.

Education and race. Among both blacks and whites, for women at the bottom and at the top of the educational spectrum, the percentage of low birth weight babies was smaller among out-of-hospital deliveries than among deliveries occurring in a hospital (table 6). In fact, women in the least educated group fared better in this respect than women with some high school education. A larger number of fetal deaths among women in the least-educated category (*15*) partly accounts for this finding, since these data examine only live births. The finding is also partly a function of the presence of some Mexican women in the lowest educational category; however, because Texas data are not included in table 6 (Texas accounts for most of the U.S. births to Mexican mothers, but education of the mother is not recorded on Texas birth certificates), the effect is minimal. The finding may also be partly a result of poorly educated women's greater reliance on midwives, who service a greater proportion of women in the lowest educational

Table 6. Percentage of low birth weight infants [1] among live births in the United States, 1978, by infants' race, mothers' education, place of birth, and attendant

Infants' race and mothers' education (years)	Hospital	Out of hospital			
		Total	Physician	Midwife	Other and unspecified
White					
0–8	7.5	7.2	8.2	5.2	7.0
9–11	8.2	9.3	10.2	5.2	10.0
12	5.7	6.3	7.8	1.9	6.2
13 and above	4.6	3.4	3.6	2.0	4.0
All educational categories	5.9	5.7	6.7	2.8	5.8
Number [2]	*2,341,058*	*17,353*	*7,276*	*2,814*	*7,263*
Black					
0–8	14.8	13.4	16.5	7.6	20.0
9–11	14.8	15.1	18.3	6.8	25.6
12	12.0	12.6	14.1	6.9	17.9
13 and above	10.4	9.9	10.2	5.7	12.8
All educational categories	12.8	13.3	15.4	6.9	19.8
Number [2]	*494,993*	*4,457*	*2,101*	*1,513*	*843*

[1] Infants weighing 2,500 gm or less at birth.
[2] Number of births for which both birth weight and mother's education were reported.

SOURCE: Unpublished data from the National Center for Health Statistics.

grouping than of women in the next two higher educational categories. As a result of unexplained factors, successful nutrition counseling, or—most likely—careful prenatal screening-out of high-risk patients to physicians and hospitals, there was a lower percentage of low birth weight babies among infants delivered by midwives than among infants in any other group, regardless of other controls on the data. Overall, in the case of low-risk mothers (well educated, 25–34 years old, multiparous), out-of-hospital births resulted in lower levels of low birth weight infants than hospital births. In other risk categories, the findings were less clear.

Apgar scores. Since birth weight and Apgar scores are strongly and positively related, the findings in table 7 are not surprising. Table 7 confirms the results shown in table 2, with only small differences overall among groups compared for scores of 7 or more, even when education is controlled for. Pronounced differences among groups compared can be seen, however, in the case of scores in the 9–10 range: out-of-hospital births achieved markedly higher percentages of scores in this range in almost all education categories, particularly in the case of births attended by physicians.

From the data available, it is impossible to determine why babies delivered by midwives had higher birth weights yet slightly lower Apgar scores. Close examination of the data does eliminate one possible explanation. Babies who weigh between 3,001 and 4,000 gm at birth generally have the highest Apgar scores (*22*), and there were no more babies of those weights delivered by physicians than by midwives. This apparent anomaly is likely a reflection of the less than perfect relationship between birth weight and Apgar scores and of possible inconsistencies in recording Apgar scores.

Discussion

The effect of potential bias in the data is unclear. The category of out-of-hospital births is hardly homogeneous. It combines carefully planned births, attended by a physician or a trained midwife, to well-educated mothers who had excellent prenatal care, with unattended births to poor, undernourished mothers who receive little or no prenatal care. Those advocating home births are obviously discussing the former and, as Burnett and associates (*13*) have shown, the outcomes of these births are distinctly better than those of the latter group. In their study of North Carolina home births, Burnett and associates discovered that some 79 percent of the home births that they could classify were planned, and that these births had a neonatal mortality rate one-twentieth that of unplanned home births—and even lower than that of hospital births.

The breakdown of the 1978 data by factors such as infants' race and mothers' age, education, parity, and nativity provides a sense of the heterogeneity of those choosing out-of-hospital births. However,

Table 7. Apgar scores for infants born in the United States, 1978, by mothers' education, place of birth, and attendant

Education (years)	Hospital (N = 2,121,996)	Out of hospital			
		Total (N = 9,942)	Physician (N = 5,445)	Midwife (N = 2,165)	Other and unspecified (N = 2,332)
	Percentage of scores 7 or greater				
0–8	89.8	85.9	89.8	70.1	86.6
9–11	89.5	86.4	88.0	81.3	88.1
12	91.0	90.4	91.1	87.7	90.7
13–15	91.5	92.1	94.3	89.7	90.5
16 and above	92.4	92.7	94.9	89.9	91.9
All educational levels	90.8	90.0	91.5	86.2	90.4
	Percentage of scores 9 or 10				
0–8	48.6	52.4	59.6	36.8	36.2
9–11	47.3	57.7	61.5	48.6	56.3
12	49.2	63.2	68.1	55.1	58.0
13–15	49.0	68.1	73.1	63.9	63.2
16 and above	51.7	68.3	72.2	65.8	64.4
All educational levels	49.0	63.3	67.5	56.9	59.8

NOTE: *N* represents births for which Apgar score and mother's education were reported.

SOURCE: Reference 22 and unpublished data from the National Center for Health Statistics.

the data in no way enable one to distinguish between planned and unplanned home births. This probably results in some negative bias in the findings toward planned home births.

The variations just discussed are not random, nor do they necessarily cancel each other out. Further research into the recording of out-of-hospital births is clearly needed to completely resolve these questions, but these biases should not greatly hinder analysis of the findings presented here. Overall, in an area where empirical research has been limited, this study has presented a reliable national data set through which one can compare in-hospital with out-of-hospital births on two measures of outcome.

There are three basic questions in the debate over place of birth:

—Who chooses out-of-hospital births?
—Why do they choose them?
—What are the results of that decision?

Despite considerable inflated rhetoric concerning these questions, there has been a paucity of research of high quality directed at them. This is partly the result of the limits of natality data in dealing with, for example, the question of choice. However, it is the third question—the question of safety—that has generated the greatest controversy.

The self-selected nature of much of the out-of-hospital population renders unfeasible experimental designs needed to answer this question satisfactorily. While the wait goes on for the "perfect study" to be completed, the debate over out-of-hospital birth settings continues to focus on anecdotal renditions of horror stories concerning home or hospital births. No study can resolve such a complex question absolutely, and surely the decision to bear a child out of hospital is based on more than issues of safety (*26*). However, judicious analysis of natality data, even given the limits of that data, can help clarify the question, if not provide all the answers.

The data examined here suggest that, at least with respect to one important measure of immediate outcome—birth weight—babies born out of a hospital are at no greater risk than those born in a hospital. The differences between the total out-of-hospital figures and the total in-hospital results are often slight, however; only in particular subgroups are the differences pronounced. The overall findings persist, but are modified, when controls for such factors as infants' race and mothers' age, education, parity, and nativity are applied singly and jointly. The risk of having a low birth weight baby seems least for well-educated white women between 25 and 34 years of age, having second children delivered by midwives. Among women of moderate education (9–12 years completed) having their first babies, infants born in hospital fare comparatively better with respect to birth weight.

'Do the findings presented here suggest that out-of-hospital birth is universally safe? Clearly they do not, . . . Rather, they appear to argue for a curtailment of the legal and professional restrictions on those who wish to attend and assist at home births and for provision of greater medical support for those who choose the home-birth option.'

This examination of birth weight does not deal with "What if an emergency arises?" scenarios often cited in home-birth versus hospital-birth disputes. It is not intended to, and it is doubtful that any research design could fully resolve this question. This research does show that, as indicated by birth weight and, to a lesser extent, Apgar scores, the chances of such a situation's arising are somewhat less for babies born out of hospitals, particularly babies born to mothers in the low-risk categories noted above.

Further research can clarify these findings even more. Obviously, separate codes for birth center and home births are needed. Also, particular attention should be paid to the role of the midwife. In virtually every instance, babies delivered by midwives out of hospitals were less likely to be of low birth weight than babies in any other group, in or out of hospitals. A clear delineation of the reasons for this difference might well have implications for prenatal care beyond the question of place of delivery. Some midwives and researchers have suggested that careful screening of pregnant mothers can result in referral of virtually all high-risk mothers to physicians and hospitals for delivery (*6*). The fact that midwives deal with a largely low-risk population likely accounts for part of the findings presented here, but surely not for all of the variance. It should also be noted that because of their frequent dealings with poor women, midwives often provide care for and deliver the babies of high-risk patients (*27*), though risk involves more than economic status. Obviously, this finding suggests a promising line of further research.

The results of the unpublished study referred to earlier, when combined with the above findings, suggest additional questions. For example, mothers giving birth out of hospitals, attended by midwives, receive less total prenatal care, as measured by number of visits, and begin it later than mothers who bear their children in hospitals (Declercq and Darney, "A Profile of Out-of-Hospital Births in the U.S., 1978"). However, despite less formal prenatal care, outcomes for these out-of-hospital mothers are better, in terms of birth weight of their babies, than outcomes for their in-hospital counterparts. Whether this is a function of a more complex form of self-selection, poor measurement of prenatal care, reliance on other forms of care, or a weakness in the implementation of prenatal care can best be resolved by further research applying more focused study designs.

Do the findings presented here suggest that out-of-hospital birth is universally safe? Clearly they do not, and even the most avid out-of-hospital birth advocates do not propose universal home birth. Rather, they appear to argue for a curtailment of the legal and professional restrictions on those who wish to attend and assist at home births and for provision of greater medical support for those who choose the home-birth option. Nothing in these findings suggests that that position is unreasonable.

It is important to keep in mind that birth weight and Apgar scores are not perfect measures of outcomes and that emergencies can occur in any setting; however, the data presented here are based on almost every recorded out-of-hospital birth in the United States in 1978 and therefore cannot be easily dismissed. Ideally, this birth certificate data will ultimately be linked to mortality and morbidity data to permit more precise analysis, but until such time, birth weight and Apgar scores must serve as admittedly imperfect surrogates. Disputes over home birth have often been phrased in terms of the safety of the hospital birth versus the emotional rewards of a home birth. The assumption that babies born out of hospitals are inherently at greater risk with respect to birth weight than those born in hospitals does not receive support here. Further research, utilizing both natality statistics and in-depth studies of smaller populations, can help reduce the risks associated with both home and hospital births.

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New Directions in Standard Terminology and Classifications for Primary Care

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SYNOPSIS

Three documents that considerably facilitate primary care research have been produced in recent years. They are an international glossary of primary care health terms, an international classification of primary care health problems, and a primary care process classification. To describe the full spectrum of primary health care, however, additional classifications are needed that detail the reasons for encounters and indicate health status. Work on these several classifications is in progress and a set of primary care classifications has been proposed as a basis for the 10th revision of the International Classification of Diseases.

THE BIRTH OF FAMILY PRACTICE as a new specialty and the accompanying establishment of family medicine departments within medical schools produced a need both for definition of the content of the new specialty and for new knowledge within its several content areas. Complex biomedical research techniques have generally been either unavailable to family physicians or inapplicable to investigations in their areas of interest. Instead, family physicians have commonly used modified epidemiologic methods to measure the content of their daily practice.

Early investigators of the phenomena of ambulatory care encountered problems when they compared their work with that of others. For example, encounters, diagnoses, and patients were not always defined or tabulated as distinct and separate entities. Patients' age groups were often reported by decades rather than by the standard groupings used in census tabulations. A diagnostic classification with considerable specificity existed for recording organic diseases (*1*), but since this classification lacked the diagnostic titles necessary to enumerate symptoms and psychosocial problems, it was unsuitable for use in primary care.

To respond to these deficiencies, at least three valuable documents have been produced by standing and ad hoc committees of two major organizations.

1. "An International Glossary of Primary Care" (*2*) contains definitions of primary care research terms and their equivalents as used in different countries.
2. "The International Classification of Health Problems in Primary Care" (*3*) details those diagnostic titles used most frequently in family medicine settings.
3. The "NAPCRG-1A Process Code for Primary Care" (*4*) is a classification designed to record the details of primary care encounters.

The organizations responsible for these publications are the North American Primary Care Research Group (NAPCRG) and the World Organization of National Colleges, Academies, and Academic Associations of General Practitioners/Family Physicians (WONCA). The purpose of this paper is to assess the need for additional classifications for primary care and to detail the work in progress that addresses these needs.