A Comparison of Prenatal Care Use in the United States and Europe

ABSTRACT

Objectives. We sought to describe prenatal care use in the United States and in three European countries where accessibility to prenatal care has been reported to be better than it is in the United States.

Methods. We analyzed the 1980 US National Natality Survey, the 1981 French National Natality Survey, a 1979 sample of Danish births, and a survey performed from 1979 to 1980 in one Belgian province.

Results. The proportion of women who began prenatal care late (after 15 weeks) is highest in the United States (21.2%) and lowest in France (4.0%). This contrasts with the median number of visits, which is greater in the United States (11) than in Denmark (10) or in France (7). Across all maternal ages, parities, and educational levels, late initiation of prenatal care is more frequent in the United States, and median number of visits in the United States is equal to or higher than that in the other countries.

Conclusions. In countries that offer nearly universal access to prenatal care, women begin care earlier during pregnancy and have fewer visits than women in the United States. (*Am J Public Health.* 1993;83:31–36)

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Introduction

Low-birthweight infants and infant mortality are more common in the United States than in many European countries.[1–3] One strategy that has been proposed to improve the US results is to increase access to prenatal care.[4] Prenatal care has been reported to be more accessible in Europe than it is in the United States.[4] However, the extent to which increased accessibility induces increased use of prenatal care in Europe compared with the United States is not well known. Information on prenatal care is not published routinely in Europe,[5] nor is it included on birth certificates as it is in the United States. In this study, we have measured the use of prenatal care in the United States, France, Denmark, and Belgium, using European population studies performed in the same period as the 1980 US National Natality Survey.

Methods

Databases

The four analyzed databases varied in methods and sources of collection, but each gave national or regional estimates. The US sample is the 1980 National Natality Survey.[6] Birth certificates in the 50 states and the District of Columbia constituted the sampling frame for the survey. Missing data were obtained from questionnaires mailed to married women and to hospitals and the attendants at delivery.[6] For this study, only data from the live birth certificates were used. After excluding multiple births, the sample totals 9536 single live births. Because the study design oversampled low-birthweight babies, data were weighted to take this and other differences between the survey and the vital registration system into account.[6] Relative weights were used in our analysis.[7] The sum of the relative weights over all the sample elements is the sample size, and statistical inference from weighted data is thus based on the number of observations collected in the survey.

The French data were collected in 1981 and include 5412 single live births.[8] The sampling design divided France into 12 areas with similar numbers of births; Corsica and French overseas territories were not included. The survey was carried out during 1 month in each area. Maternity units were stratified according to their size and to their public or private status. Within each stratum, a random sample of maternity units was selected. Within each maternity unit, a random sample of women was interviewed during their postpartum hospital stay. Information was

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TABLE 1—Prenatal Care Use in the United States, France, Denmark, and Belgium

	United States	France	Denmark	Belgium
No care, % (n)	1.0 (9536)	0.2 (5244)	NA	0.5 (17 764)
Late care (> 15 weeks), % (n)	21.2 (8550)	4.0 (4744)	7.8 (3885)	13.2 (17 320)
Median number of visits (n)				
Crude	11 (8063)	7 (5233)	10 (4147)	NA
Late care and preterm excluded	12 (5451)	7 (4341)	11 (2555)	NA

Note. NA = not available.

also derived from the hospital records. Women refused to participate in 0.9% of the cases, and the interview was impossible in 4.6% of the cases, mainly because of language incompatibility.

The Danish data come from two linked databases corresponding to the births that occurred in 1979.[9] In Denmark, data on the gestational age at the first prenatal visit are available at the State Serum Institute. A representative sample of women was drawn from the forms available at the institute. Women from the Faroe Islands and from Greenland were excluded. The records from the State Serum Institute were linked with the birth certificates to obtain the number of prenatal visits and the gestational age at delivery. Record linkage was successful in 76% of the cases. The resulting sample includes 4216 single live births. In addition, another file including all the single live births to women who were not of Danish nationality has been prepared and analyzed separately. Again, forms from the State Serum Institute were linked with the birth certificates, resulting in an additional population of 841 single live births.

The Belgian data correspond to the deliveries occurring in one province (Hainaut).[10] Women who delivered between April 1, 1979, and September 30, 1980, received a questionnaire to be completed during their postpartum hospital stay. Home visitors collected the questionnaires from mothers who did not complete them before leaving the hospital and from mothers who delivered at home. The completion rate was 79% of all births in the province, resulting in a database of 18 038 single live births.

Variables

In each database, raw data were used to generate the variables in a standard way. Dependent variables were no prenatal care, late prenatal care, and the number of visits. Late prenatal care has been defined as care beginning after 3 completed months (15 completed weeks) of gestation. In France, the gestational age at the first visit was derived from the date of the visit and of the last menstrual period. The value of 15 was assigned for the day of the month if only the month was given. The number of visits was not available from the Belgian data.

Independent variables were maternal age, parity, marital status, education of the mother, and mother's nationality or country of birth. The current birth was included into the parity. The equivalent of "college" was "university or superior education" in Belgium and "university" in France. Information on education was not available from the Danish data.

Regarding mother's nationality or country of birth, women were defined as migrants or nonmigrants. In Western Europe, the most numerous groups of non-Western Europeans are Turks and North Africans.[11] Thus, in the European countries of our study, we compared women from Turkey, Algeria, Morocco, and Tunisia (migrants) with the native-born European women (nonmigrants). Because women from Pakistan are relatively numerous in Denmark, we also performed a separate analysis of this group. In the United States, the largest group of immigrants comes from Mexico,[12] so we compared women born in Mexico with women born in the United States. Whenever possible, the definitions of nationality we used in the European countries were also based on the mother's country of birth, but this information was not always available. The variable used in Belgium was the mother's nationality when she was born. In Denmark, it was the mother's current nationality, and in France it was the mother's country of birth. However, women who were born in North Africa but are of French nationality were not classified as migrants because most of them are ex-colonials.

Preterm delivery was a potential confounding factor because pregnancies with shorter gestations might be expected to include fewer visits. Information on preterm deliveries was available in each country except Belgium. Preterm deliveries were defined as deliveries occurring before 37 completed weeks of gestation. In France, the gestational age at delivery was derived from the date of delivery and of the last menstrual period.

Analysis

Overall figures are presented for the proportion of women having no prenatal care. The proportion of women who began prenatal care late (after 15 weeks) and the median number of visits were calculated after the women with no prenatal care were excluded. Medians were preferred to means because of the nonnormal distributions of the number of visits. To adjust for potential differences in the median number of visits among countries due to different frequencies of late initiation of prenatal care and preterm deliveries, we also computed the median after excluding late prenatal care initiation and preterm deliveries.

Univariate associations of sociodemographic factors with initiation of prenatal care were explored in each country. Adjusted odds ratios of having late care and 95% confidence intervals were derived within each country from logistic regressions,[13] taking all independent variables into account. The median number of visits was also calculated for each category of the sociodemographic factors investigated. The SAS software has been used for the analysis.

Results

Our results show that the proportion of women with no care is very low in the four countries investigated but is highest in the United States (Table 1). The proportion of women who began prenatal care late is highest in the United States and lowest in France. In contrast, the median number of visits is greater in the United States than in Denmark and France. When women with late care and preterm deliveries are excluded, the difference in the median number of visits between the United States and France is even larger.

Figure 1 shows that the United States has the widest range of prenatal care visits, with a higher percent of both more and fewer prenatal visits. The proportion of women with fewer than three visits is 1.9% in the United States, 0.7% in France,

and 0.4% in Denmark. When women with late initiation of care or preterm deliveries are excluded, the number of women with fewer than three visits is 0.4% in the United States, 0.1% in France, and 0.1% in Denmark. The distribution of the number of visits (Figure 1) shows that there are more women with a high number of visits (at least 13) in the United States than in France or Denmark.

Beginning prenatal care late is more common in the United States than in the other countries, whatever the maternal age, the parity, the marital status, or the educational level (Table 2). However, the frequency of late care initiation among migrants is highest in Belgium. The Danish results presented in Table 2 are from the database representative of the country, but they include only 24 migrants. When the second Danish database—all births to women who were not of Danish nationality—is used, the frequency of late care initiation among the migrants from North Africa and Turkey is 41.7% (n = 204) and from Pakistan is 34.1% (n = 88).

When the US population is restricted to Whites, the percent whose prenatal care began late is again larger for each category than for the corresponding category in European countries (data not presented). Among White American women, late initiation is, for example, observed in 38.6% of women aged 19 or younger, 24.3% of women with a parity of four or more, 45.4% of unmarried women, 21.2% of women with an elementary or high school education, and 10.4% of women with a college education.

Inequalities exist within each country. The excess of late care initiation observed in Table 2 in women who were of young maternal age and high parity, unmarried, less educated, and of migrant nationality is always statistically significant within a country, except in France, where there is no significant relation between education and early care. When the other independent variables are taken into account (Table 3), the adjusted odds ratios are still significantly higher than 1.0 for women who were of young maternal age, high parity, unmarried, and migrants, and, except in France, with a low educational level. The intensity of inequalities might be appreciated by examining the adjusted odds ratios between groups within each country (Table 3). The United States does not rank as the country with the highest odds ratios for most of the characteristics investigated. The median number of visits (Table 4) in the United States is equivalent to or higher than that in the other countries, except among unmarried women. When late care initiation and preterm deliveries are excluded (Table 4), the median number of visits in the United States is equal to or higher than that in the other countries among all groups.

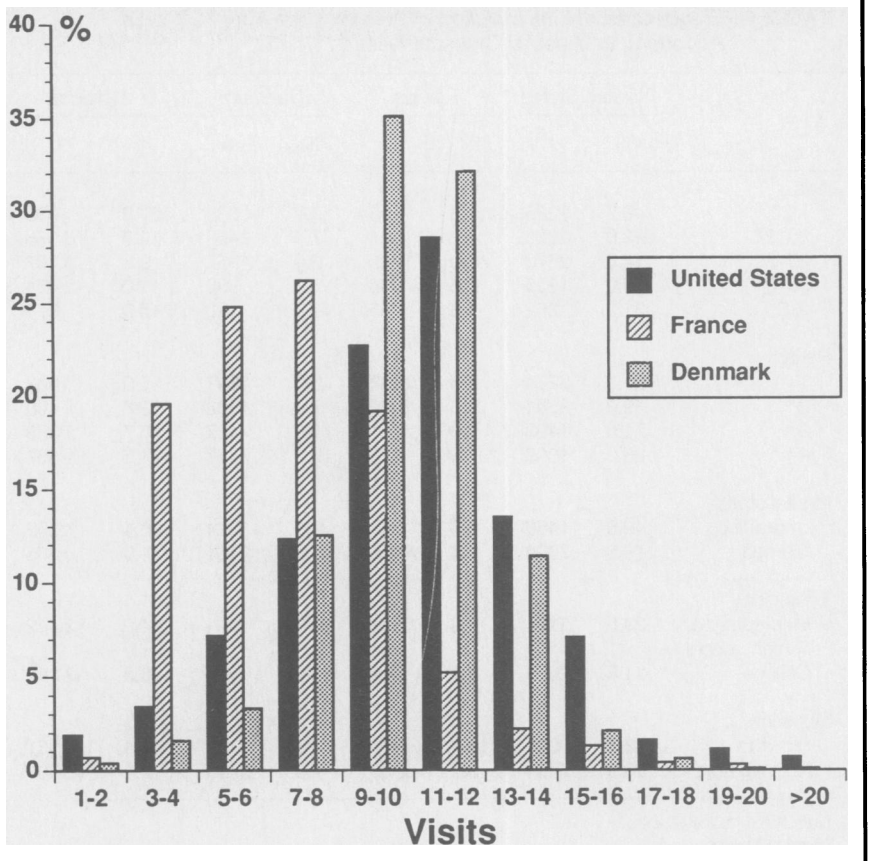

FIGURE 1—Frequencies of the number of prenatal visits in the United States, France, and Denmark.

Discussion

Our results show that more US women begin care late or have no care at all than do European women from the countries investigated. Among those countries, the proportion of late care initiation was the lowest in France. Of special interest is the difference in earliness of care between France and the Belgian province because the two areas are otherwise very similar. This observation suggests a positive effect of the financial incentive policy existing in France. Since 1953, a special allowance is received by every French woman who makes at least one visit during the first trimester and at least two other visits, at 6 and 8 months, thereafter.[14,15] Payment of the allowance starts at the fourth month of pregnancy and is stopped if the woman does not maintain a schedule of visits. In 1990, this allowance amounted to approximately US $170 per month. Whether those incentives have an impact on the earliness of care is difficult to ascertain. In our study, French women reached the minimum number of three visits more often than women from the United States but not more often than women from Denmark. Our data thus suggest that the French policy of financial incentives has a possible impact on the earliness of care, but the data are inconclusive about the impact of this policy on the number of visits.

With migrants as the only exception, each group of US women sought prenatal care later than the corresponding European group. Late initiation of care in the United States is not restricted to poorer women. Moreover, the differences between the United States and Europe persist when the analysis is restricted to White Americans. For example, a White American woman with a college education is more likely to begin prenatal care later in pregnancy than is a European woman with the same level of education. This could reflect the fact that access to European programs is generally not linked to a woman's socioeconomic status.[4] In

TABLE 2—Frequencies of Late Initiation of Prenatal Care After 15 Weeks, According to Maternal Characteristics

	United States		France		Denmark		Belgium	
	%	n	%	n	%	n	%	n
Age								
<20	40.7	1285	11.8	255	13.9	339	27.0	1 089
20–24	22.0	2896	4.2	1504	7.1	1468	12.7	6 156
25–29	14.0	2673	3.0	1723	6.9	1357	9.7	5 707
30–34	15.0	1333	2.6	908	7.3	590	11.0	2 474
≥ 35	21.3	362	5.3	265	11.3	130	15.9	571
Parity								
1	21.1	3274	4.3	1993	6.6	1647	10.9	7 833
2	19.0	2544	3.5	1620	7.0	1338	12.3	5 408
3	21.0	1493	2.9	751	11.8	417	16.7	2 398
4+	26.3	1205	7.3	370	19.7	117	21.8	1 681
Marital status								
Unmarried	42.6	1460	9.3	543	9.6	1324	30.1	1 299
Married	16.8	7090	3.4	4176	6.9	2561	11.6	15 435
Education								
Elementary or high school	23.8	5121	4.0	3816	NA	NA	14.0	12 442
College	11.6	2698	3.1	649	NA	NA	5.3	2 880
Migration								
Migrants	43.5	220[a]	11.3	203[b]	37.5	24[b]	46.4	351[b]
Nonmigrants	20.3	7734[c]	3.7	3986[d]	7.3	3730[e]	12.1	12 561[f]

Note. NA = not available.
[a]Born in Mexico.
[b]From North Africa and Turkey.
[c]Born in the US.
[d]Born in France.
[e]Danish.
[f]Belgian at birth.

Europe, women on all socioeconomic levels are entitled to use the programs designed to increase accessibility to prenatal care. They also receive indirect benefits such as employment protection if they begin care early. Thus, all European women benefit from health systems that make early prenatal care relatively easy, inexpensive, and rewarding.

Migrants begin prenatal care late in Belgium more often than they do in the United States. This suggests that access to prenatal care for migrants may be better in the United States than in Belgium. However, migrant populations are difficult to compare. Mexicans come from a country where 84.2% of the women had at least one prenatal visit in 1987,[16] whereas Moroccans come from a country where only 24.8% of the women used prenatal care during the same year.[17] Mexicans migrating to the United States might thus accept prenatal care more easily than Moroccans migrating to Europe. Still, late care initiation is far less common among migrant women in France as compared with those in Belgium or Denmark. Again, this observation suggests a possible positive effect of the French policy of financial incentives on the earliness of care. It is also possible that migrants from North Africa and Turkey in France differ from those living in Belgium or Denmark. They form a larger group in France (4.8%) than in Denmark (0.6%), and may have been settled in France for a longer time.

Other social inequalities should also be interpreted according to the number of people included in each category in each country. The socioeconomic and sociodemographic characteristics of the populations may be derived from the absolute numbers presented in Table 2. For example, young maternal age is more common in the United States (15.0%) than in France (5.5%), Denmark (8.7%), and Belgium (6.8%), but unmarried women are more common in Denmark (34.1%) than in the United States (17.1%). Young maternal age and marital status could have different social meaning in different countries.

We found that social inequalities, as measured by odds ratios of beginning care late, exist in each country and are generally of comparable magnitude. Measuring social inequalities by odds ratios is, however, only one possible approach. One of its drawbacks is that it is not easy to compare odds ratios when baseline levels are different. This is the case here, as the rates for the reference population are higher in the United States than in the European countries (Table 2). Risk differences present a different pattern of social inequalities, as they show that the gap between the classes is lower in Europe than in the United States. For example, the difference between the proportion of women aged 19 or less beginning prenatal care late and that of women aged 25 to 29 doing so is 26.7% in the United States, 17.3% in Belgium, 8.8% in France, and 7.0% in Denmark. The difference between unmarried and married women is 25.8% in the United States, 18.5% in Belgium, 5.9% in France, and 2.7% in Denmark (Table 2).

Even though women seek prenatal care earlier in Europe, they do not have more visits than women in the United States. The number of visits in France is lower than that in the United States, whatever sociodemographic or socioeconomic group is considered. The difference between Europe and the United States is not limited to low-risk women. A teenager, for example, has a median of 5.5 visits in France and 10 in the United States. When late care initiation and preterm deliveries are excluded, the median is 6 in France and 11 in the United States (Table 4). Such differences probably reflect differences in consensus about how many prenatal visits is adequate. The American College of Obstetricians and Gynecologists recommends 13 visits if the first visit takes place by the eighth week of pregnancy and if the woman delivers at 40 weeks of pregnancy.[18] In France, it is generally recommended that women should have seven visits during their pregnancy.[8] This is very close to the recommendations of a recent US expert committee[19] that healthy multiparous women should have seven prenatal visits and healthy nulliparous women should have nine.

Within each country, the difference in the number of visits among the sociodemographic groups is not very large. It seems that once prenatal care has been initiated, the number of visits is quite close to the local standards, whatever the social category of the women.

The European databases we used have the advantage of being population studies performed during the period corresponding to the 1980 US National Natality Survey. Although the data were collected a decade ago, they represent the

most recent set of simultaneously collected databases available. The 1980 US data are still relevant, because use of prenatal care changed little during the last decade. In 1989, the proportion of women in the United States with no prenatal care was 2.2% and the median number of visits was 12.0 (RL Heuser, personal communication, 1992). The French survey was designed to gather a representative sample of births throughout the country. The results we report for 1981 are consistent with those of previous French surveys, which showed that care started early but that the number of visits was low: the median number of visits was four in 1972 and five in 1976.[8] The Danish database links the two sources of information about prenatal care available in that country.[9] Loss during linkage with the national birth register was larger among migrants than among Danish women. Women who initiated care late had significantly less loss during linkage than the others, suggesting that abortion was an important cause of nonlinkage between the Serum Institute forms and the birth certificates. For the Belgian database, the aim was to register all births in one province (Hainaut). However, that particular province might not be representative of the general Belgian situation as it includes areas with higher rates of low-birthweight infants than are found in other parts of Belgium.[20] The comparison of the Belgian samples with the civil registration data shows that women under age 20 and migrants were underrepresented in the surveys we analyzed.[10] However, the underreporting of teenagers and migrants in Belgium is not large enough to explain the difference of earliness of care between the Belgian and the US data.

The measure of the gestational age at first visit could be affected by differences in registration of a first prenatal visit in different countries. In the 1980 US National Natality Survey, the tendency was for the interviewed mothers to state that care began earlier than was indicated on the birth certificates.[21,22] However, if we reanalyze our data on the earliness of prenatal care using the information from the mother's questionnaires rather than the birth certificates, we would still find that US women begin care later than European women. This remains true for all sociodemographic groups, with the exception of women aged 30 to 34 and of parity 3; these groups no longer show a difference in earliness of care between the United States and Belgium. In the French database, the time of the first prenatal visit was determined by two different questions. One question asked for the date of the first visit, and another asked if a visit took place during the first trimester. We choose to use the date of the first

TABLE 3—Risk of Beginning Prenatal Care Late (after 15 Weeks), According to Maternal Characteristics[a]

	United States		France		Denmark		Belgium	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age								
< 20	3.7	3.0, 4.5	3.6	2.1, 6.2	2.7	1.7, 4.3	4.5	3.7, 5.5
20–24	1.7	1.5, 2.0	1.4	0.9, 2.1	1.2	0.9, 1.7	1.6	1.4, 1.8
25–29	1.0[b]		1.0[b]		1.0[b]		1.0[b]	
30–34	0.9	0.7, 1.1	0.7	0.4, 1.2	0.8	0.6, 1.3	0.9	0.7, 1.1
≥ 35	1.3	0.9, 1.8	1.2	0.6, 2.4	1.1	0.5, 2.0	0.9	0.7, 1.3
Parity								
1	1.0[b]		1.0[b]		1.0[b]		1.0[b]	
2	1.3	1.1, 1.6	1.2	0.8, 1.7	1.7	1.2, 2.3	1.7	1.5, 1.9
3	1.8	1.5, 2.1	0.9	0.6, 1.7	3.3	2.2, 5.0	2.6	2.2, 3.1
4+	2.4	1.9, 2.9	2.2	1.2, 4.1	6.1	3.4, 11.1	3.7	3.1, 4.5
Marital status								
Unmarried	2.8	2.4, 3.3	2.6	1.8, 3.8	1.7	1.2, 2.3	2.9	2.5, 3.4
Married	1.0[b]		1.0[b]		1.0[b]		1.0[b]	
Education								
Elementary or high school	1.4	1.2, 1.6	0.9	0.6, 1.5	NA	NA	2.0	1.7, 2.4
College	1.0[b]		1.0[b]		NA	NA	1.0[b]	
Migration								
Migrants	1.7	1.1, 2.7	2.8	1.4, 5.6	4.5	1.6, 12.5	4.7	1.2, 6.5
Nonmigrants	1.0[b]		1.0[b]		1.0[b]		1.0[b]	

Note. OR = odds ratio, CI = confidence interval, NA = not available.
[a]Odds ratios adjusted for all the other characteristics listed in the table.
[b]Reference group.

TABLE 4—Median Numbers of Prenatal Visits According to Maternal Characteristics

	United States		France		Denmark	
	Crude	Late Care & Preterm Excluded	Crude	Late Care & Preterm Excluded	Crude	Late Care & Preterm Excluded
Age						
< 20	10	11	5.5	6	10	10
20–24	11	12	7	7	11	11
25–29	11	12	7	7	10	11
30–34	11	12	7	7	10	10
≥ 35	11	11	7	8	10	11
Parity						
1	11	12	7	8	10	11
2	11	12	7	7	10	11
3	10	12	6	7	10	10
4+	10	11	6	6	10	11
Marital status						
Unmarried	9	11	6	7	10	11
Married	11	12	7	7	10	11
Education						
Elementary or high school	10	12	7	7	NA	NA
College	12	12	8	8		
Migration						
Migrants	7	10	5	6	9	9
Nonmigrants	11	12	7	7	10	11

Note. NA = not available.

visit because it resulted in a larger proportion of women initiating care late than the proportion estimated by the other question. Had we used the results from this other question, the differences between the United States and France would have been even greater.

In conclusion, women begin prenatal care much earlier in European countries than they do in the United States. Fewer financial barriers characterize the care delivery systems in the European countries investigated[4] and may explain why low-income women begin prenatal care earlier there. Furthermore, the French data suggest that financial incentives could help to reduce late initiation. The number of visits is higher in the United States than in Europe among all socioeconomic groups. Differences between countries in the numbers of visits probably reflect differences in consensus about the adequate number of prenatal visits. Our results suggest that better accessibility may induce changes in the earliness of prenatal care, and that changing recommendations may modify the number of visits. Universal access could thus result in earlier care without inducing an expensive increase of the number of visits. □

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