Maternal Occupation and Industry and the Pregnancy Outcome of U.S. Married Women, 1980

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Synopsis

Data from the 1980 National Natality and National Fetal Mortality Surveys were used to characterize the occupations of women during the year before delivery; to search for disproportionate numbers of adverse pregnancy outcomes in specific occupational groups; and to compare demographic, reproductive, and lifestyle characteristics of employed mothers to those of mothers not employed in the year before delivery.

National estimates were derived from the sample through a complex poststratified ratio adjustment procedure. For all pregnancy outcome groups, the greatest proportion of mothers were employed in three industry categories: professional and related services, wholesale and retail trade, and manufacturing; and in four occupation categories: clerical and kindred workers; professional, technical, and kindred workers; service workers; and operatives.

Compared with employed mothers of live-born infants, a greater proportion of employed mothers of low birth weight infants worked full-time but stopped working before the third trimester. Compared with unemployed mothers, a larger proportion of employed mothers were between 20–29 years old, college educated, had a total family income of $21,000 or more per year, received early prenatal care, had no previous pregnancy, and drank alcohol during pregnancy. Estimates from this study may be used to (a) provide a better perspective of the magnitude of reproductive health problems, (b) target certain industrial populations for further research, and (c) assist in identifying causes of reproductive failure.

As the number of women entering the work force has increased, so has concern about adverse reproductive effects associated with occupational factors. Several environmental agents present in the workplace have been associated with adverse pregnancy outcome. These include X-rays (*1*), anesthetic gases (*2,3*), organic solvents (*4*), styrene, and carbon disulfide (*5*). Although there is a great deal of interest in occupationally related reproductive effects, there is little information about the magnitude of the problem in the United States. The 1980 National Natality and National Fetal Mortality Surveys (NNS–NFMS) represent initial steps toward filling this information gap.

An initial analysis of maternal employment data from the 1980 NNS–NFMS focused on employment characteristics of married mothers of live-born infants (*6*). Employment at some time during the year before delivery was found to differ substantially according to live-birth order; maternal age, race, and education; and interval since previous live birth. That analysis characterized mothers of all live-born infants and did not address the issue of adverse pregnancy outcomes.

In this paper we examine maternal employment data according to three adverse pregnancy outcomes: low birth weight, congenital malformation, and late fetal death. For each outcome category, national estimates are presented giving the number of married women employed at any time during the year before their 1980 delivery and the industry and occupation categories in which they were employed. Similar data are presented for mothers of all live-born infants. In the analysis, we also look at the proportions of employed mothers who worked full time and those who were working at the beginning of the second and third trimesters. Finally, distributions of demographic and other risk factors by maternal employment status are examined to assess which factors may influence the relationship between maternal employment and pregnancy outcome.

Data Source

The NNS–NFMS sampled live births and fetal deaths that occurred in the United States in 1980. The basic sources of information were the birth and fetal death

certificates. In addition, the surveys gathered data through questionnaires sent to mothers who were married at the time of delivery, to hospitals where the deliveries occurred, to attendants at delivery, and to providers of diagnostic or treatment radiation during the 12 months before delivery. Data on maternal employment were collected from the questionnaires mailed to married mothers. This analysis is restricted to live births and fetal deaths among married mothers responding to the surveys. Further details of the survey methodology are given elsewhere in this issue (*7*).

All data in this paper are presented for each of four pregnancy outcome categories: (*a*) live births; (*b*) low birth weight infants, that is, the subset of live births with a birth weight less than 2,500 grams; (*c*) infants with malformations, that is, live births with one or more major or minor malformation noted on the birth certificate or the hospital questionnaire or both; and (*d*) late fetal deaths occurring at 28 weeks gestation or later.

Table 1 shows the total number of birth and fetal death certificates sampled, the number of married mothers in the sample, and the number and percent of married mothers who responded to the survey. Of the 7,825 married mothers experiencing live births and the 4,814 with fetal deaths in the sample, 6,223 or 80 percent with live births and 3,585 or 75 percent with fetal deaths responded to the survey.

Using data from the birth certificate, a total of 1,489 low birth weight infants born to married mothers were identified in the live birth sample. Of these, 1,104 or 74 percent of mothers of low birth weight infants responded to the survey (table 1).

Infants with malformations were identified by using two survey data sources, the birth certificate and the hospital questionnaire. The birth certificate provided space for a description of any congenital malformations or anomalies that were noted at birth. The hospital questionnaire included a checklist of specific malformations, as well as space for a description of any other malformations. The malformations included in the checklist were those known to be associated with fetal alcohol syndrome, but they were not labeled as such on the questionnaire. Because the hospital questionnaire was used to identify infants with malformations, the analysis of the malformation data was restricted to live births with both a mother's and a hospital's questionnaire. Of the 6,223 live births with a mother's questionnaire 5,009, or 80.5 percent, had hospital questionnaires. Of these, 470 had malformations noted on either the hospital questionnaire or the birth certificate (46 were noted only on the birth certificate, 381 were noted only on the hospital questionnaire, and 43 were noted on both).

Table 1. Study sample from the 1980 National Natality Survey-National Fetal Mortality Survey (NNS-NFMS), according to pregnancy outcome

Study sample component	All live births	Low birth weight infants	Infants with malformations	Fetal deaths
Total NNS-NFMS sample	9,941	2,179	[1]	6,386
Number married	7,825	1,489	[1]	4,814
Number of respondents[2]	6,223	1,104	470	3,585
Percent of respondents[2]	79.5	74.1	[1]	74.5

[1] Not available.
[2] Respondents to both mother's questionnaire and hospital questionnaire for infants with malformations; respondents to mother's questionnaire for all other pregnancy outcomes.

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For this analysis, mothers who worked at any time during the year before delivery are referred to as "employed" and those who did not work are referred to as "unemployed." Those who had been employed were asked to describe their chief job activity. Responses to a series of employment questions were used by trained coders to assign two codes to each mother, an industry code and an occupation code. The industry and occupation (I-O) codes are standard ones used by the U.S. Census Bureau to classify employment characteristics of individuals (*8*). The codes were combined into 10 major industry categories and 9 major occupation categories for analysis purposes. Selected industry and occupation subgroups and individual codes of interest were also examined.

National estimates and percentages were derived from the sample by use of a complex poststratified ratio adjustment procedure; a similar procedure is described in a forthcoming report (*9*) of the National Center for Health Statistics (NCHS). Since our analysis used data from respondents only, the weights differed slightly from those in the NCHS report.

Although the main purpose of this analysis was to generate national estimates, results for the different pregnancy outcome groups were compared for descriptive purposes. To examine variation among the estimated proportions, approximate 95 percent confidence intervals

'The utility of the malformation estimates may be limited because of the emphasis placed on malformations associated with the fetal alcohol syndrome. Because they were included in a check list, the fetal alcohol syndrome malformations are more likely to be reported than are other malformations.'

were estimated by use of the normal approximation to the binomial distribution (*10*). Those that did not overlap have been highlighted in the text. The confidence intervals are only approximate because the estimated proportions were not based on a simple random sample. Furthermore, NCHS recommends against estimating standard errors for NNS–NFMS estimates based on fewer than 30 respondents (*9*). These smaller estimates are included in the tables, but no confidence intervals could be estimated for them.

Results

An estimated 2,944,580 live births and 14,796 fetal deaths occurred among married women in the United States in 1980 (table 2). An estimated 169,775 live births were of low birth weight infants, and 246,200 live-born infants had malformations noted at the time of birth.

Sixty-two percent of mothers of live-born infants were employed at some time during the year before delivery (table 2). Of these, nearly 70 percent were employed in three industry categories: professional and related services (32.2 percent); wholesale and retail trades (21.9 percent); and manufacturing (15.4 percent) (table 3). A comparison of the proportion of mothers in each industry category across the pregnancy outcome groups showed that the confidence intervals overlapped for every industry category. The most notable difference was between women employed in manufacturing who experienced fetal deaths and those delivering live-born infants. For the fetal deaths, the 95-percent confidence interval was from 16.5 to 19.7 percent. For the live births, the 95-percent confidence interval was from 14.3 to 16.5 percent.

Mothers who were in professional and related services industries at any time in the 12 months before delivery made up the largest proportion of employees in all pregnancy outcome groups in 1980 (table 3). They delivered an estimated 588,000 infants. Their proportions varied little across the pregnancy outcome categories. An estimated 57,600 infants with malformations were born to mothers employed in professional and related services. This number represents 35.7 percent of all infants with malformations in contrast to 32.2 percent of all live births among women employed at any time during the 12 months before delivery.

Mothers employed in elementary and secondary schools, the largest subgroup of this industry category, bore 13.2 percent of the infants with malformations or 21,300 malformed infants. This proportion was greater than the 10.9 percent of all live births delivered by mothers in this subgroup. Another large subgroup in professional and related services was the hospital industry. An estimated 9.5 percent, or 15,300 malformed infants, were born to mothers in this industry; they also experienced 168,000 live births, or 9.2 percent of all live-born infants.

Wholesale and retail trade industries employed about a fifth of the mothers in all outcome categories. An estimated 21.9 percent of infants with malformations and an identical 21.9 percent of the live births were born to mothers in this industry group. Mothers employed in eating and drinking places represented the largest subgroup within the wholesale and retail trades. They bore

Table 2. Estimated total married women according to employment status and pregnancy outcome, United States, 1980

Employment status during 12 months before delivery	All live births		Low birth weight infants		Infants with malformations		Fetal deaths	
	Estimated U.S. total	Percent	Estimated U.S. total	Percent	Estimated U.S. total	Percent	Estimated U.S. total	Percent
Total	2,944,580	100.0	169,775	100.0	246,200	100.0	14,796	100.0
Employed at any time	1,826,000	62.0	102,900	60.6	161,300	65.5	9,500	64.0
Not employed	1,118,580	38.0	66,875	39.4	84,900	34.5	5,296	36.0

Table 3. Married women employed at any time during the 12 months before delivery, according to industry and pregnancy outcome, United States, 1980

Industry[1]	All live births			Low birth weight infants			Infants with malformations			Fetal deaths		
	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample
Total employed at any time during the 12 months before delivery	100.0	1,826,000	[2]3,859	100.0	102,900	[2]669	100.0	161,300	[2]307	100.0	9,500	[2]2,227
Agriculture, forestry, and fisheries (017–028)	1.5	27,400	57	1.3	1,300	9	2.2	3,500	5	1.9	180	40
Construction (067–077)	1.1	20,100	39	0.4	400	3	2.3	3,700	6	0.9	90	19
Manufacturing (107–398)	15.4	281,200	582	15.7	16,200	107	15.3	24,700	46	18.1	1,720	403
Metal (139–169)	1.3	23,700	49	1.4	1,400	9	0.9	1,500	2	1.0	95	23
Machinery (177–198)	1.8	32,900	67	1.5	1,500	10	1.0	1,600	3	1.3	120	28
Electrical machinery and equipment (199–209)	1.9	34,700	73	2.2	2,300	16	1.2	1,900	5	2.2	210	48
Textile mill products (307–318)	1.0	18,300	37	0.8	800	6	2.9	4,700	7	1.4	130	32
Apparel and other textile products (319, 327)	2.2	40,200	75	1.5	1,500	10	2.7	4,400	7	2.8	270	62
Printing, publishing, and allied industries (338–339)	1.2	21,900	47	1.6	1,600	11	0.3	500	2	1.5	140	34
Transportation, communication, and other public utilities (407–479)	4.0	73,000	160	4.7	4,800	31	2.2	3,500	8	5.2	490	117
Transportation (407–429)	1.7	31,000	69	2.3	2,400	15	0.6	1,000	3	2.4	230	54
Communications (447–449)	1.8	32,900	68	1.8	1,900	12	1.6	2,600	5	1.8	170	41
Wholesale and retail trade (507–698)	21.9	399,900	809	22.1	22,700	141	21.9	35,300	68	21.8	2,070	477
Wholesale trade (507–588)	1.9	34,700	70	1.3	1,300	9	2.7	4,400	7	2.5	240	55
Eating and drinking places (669)	6.3	115,000	230	7.4	7,600	45	7.8	12,600	22	5.5	520	117
Finance, insurance, and real estate (707–718)	9.7	177,100	373	9.9	10,200	70	6.3	10,200	20	8.2	780	183
Business and repair services (727–759)	3.1	56,600	120	3.5	3,600	23	2.0	3,200	7	3.1	290	68
Personal services (769–798)	4.7	85,800	176	4.9	5,000	34	5.7	9,200	15	5.2	490	114
Hotels and other lodging places (777–778)	1.5	27,400	53	0.9	900	6	1.8	2,900	4	1.9	180	43
Beauty and barber shops (787–788)	1.7	31,000	70	2.5	2,600	18	1.9	3,100	5	1.6	150	36
Professional and related services (828–897)	32.2	588,000	1,257	31.7	32,600	212	35.7	57,600	113	30.6	2,910	690

Continued

Table 3. Married women employed at any time during the 12 months before delivery, according to industry and pregnancy outcome, United States, 1980—Continued

Industry[1]	All live births			Low birth weight infants			Infants with malformations			Fetal deaths		
	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample
Offices of dentists and physicians (828–829, 837, 847)	2.3	42,000	88	2.4	2,500	15	2.3	3,700	6	2.0	190	46
Hospitals (838)	9.2	168,000	350	8.4	8,600	56	9.5	15,300	32	8.2	780	183
Convalescent institutions (839)	2.2	40,200	82	2.1	2,200	13	2.7	4,400	7	2.5	240	53
Other health services, (848)	1.4	25,600	51	1.2	1,200	7	1.7	2,700	4	0.7	70	16
Elementary and secondary schools (857)	10.9	199,000	434	10.5	10,800	72	13.2	21,300	43	10.9	1,040	248
Colleges and universities (858)	1.4	25,600	59	2.1	2,200	15	2.0	3,200	7	2.2	210	49
Religious, welfare services, and nonprofit organizations (877–887)	2.0	36,500	80	2.5	2,600	17	2.4	3,900	8	1.9	180	42
Public administration (907–937)	5.6	102,300	250	5.0	5,100	32	5.1	8,200	14	4.4	420	98
Other industry (047–057, 807–809)	0.9	16,400	36	0.9	900	7	1.5	2,400	5	0.8	80	18

[1] Major industry groups and selected subgroups; the code numbers listed are those used in the 1970 U.S. Census.
[2] Number of women in sample who gave complete information on type of industry.

NOTE: Percents do not always total 100 because of rounding. U.S. estimates for major industry categories may also vary from totals because of rounding.

7.8 percent of the infants with malformations, or 12,600 malformed infants, compared with 6.3 percent of all live-born infants.

A greater proportion of women experiencing fetal deaths were employed in manufacturing industries compared with those delivering live births. An estimated 1,720 or 18.1 percent of the fetal deaths occurred to these mothers, compared with 281,200 or 15.4 percent of the live births. Manufacturing subgroups of interest are textile mill products and the apparel and other textile products industries, which contributed the largest proportions (2.9 percent and 2.7 percent respectively) of infants with malformations among the manufacturing industries. The apparel industry also contributed the largest proportion of fetal deaths (2.8 percent), followed by the electrical machinery and equipment subgroup (2.2 percent).

Nearly 86 percent of married mothers of live-born infants employed at any time during the 12 months before delivery were in four occupation categories: clerical and kindred workers (39.3 percent); professional, technical, and kindred workers (21.9 percent); service workers, except private household workers (15.1 percent); and operatives, except those working in transportation (9.5 percent), as table 4 shows. As with the industry groups, the proportion of mothers in each occupation group varied little across the pregnancy outcome categories, with all confidence intervals overlapping for every occupation group.

The clerical and kindred worker group represented the largest proportion of employees in all pregnancy outcome categories. An estimated 39.3 percent of all live births, or 717,600 infants, were born in 1980 to mothers employed as clerical and kindred workers at some time during the 12 months before delivery. Similarly, an estimated 40.3 percent of infants with malformations were born to clerical and kindred workers, compared with 39.2 percent of the low birth weight infants and with 37.2 percent of the fetal deaths.

Secretaries comprised the largest subgroup of clerical and kindred workers. It is estimated that 13,800 or 13.4 percent of low birth weight infants, 19,200 or 11.9

Table 4. Married women employed at any time during the 12 months before delivery, according to occupation and pregnancy outcome, United States, 1980

Occupation[1]	All live births			Low birth weight infants			Infants with malformations			Fetal deaths		
	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample
Total employed at any time during the 12 months before delivery	100.0	1,826,000	[2]3,803	100.0	102,900	[2]664	100.0	161,300	[2]306	100.0	9,500	[2]2,227
Professional, technical, and kindred workers (001–195)	21.9	399,900	873	20.8	21,400	142	21.8	35,200	72	20.4	1,940	465
Registered nurses (075)	4.2	76,700	165	3.8	3,900	27	2.5	4,000	9	3.8	360	87
Health technologists and technicians (080, 081, 083, 085)	1.6	29,200	58	0.9	900	6	0.9	1,500	3	0.9	90	21
Social and recreation workers (100–101)	0.9	16,400	38	1.5	1,500	10	2.0	3,200	7	0.8	80	19
Preschool, elementary, and secondary teachers (142–144)	7.4	135,100	300	7.1	7,300	48	9.2	14,800	30	7.9	750	182
Writers, artists, and entertainers (175–194)	1.0	18,300	37	0.6	600	4	0.4	600	1	0.7	70	15
Managers and administrators, except farm (201–245)	5.3	96,800	200	3.7	3,800	27	3.8	6,100	11	4.2	400	94
Sales workers (260–285)	3.9	71,200	149	3.8	3,900	27	2.0	3,200	8	4.8	460	107
Sales clerks, retail trade (283)	1.9	34,700	68	1.3	1,300	9	0.4	600	3	2.5	240	56
Clerical and kindred workers (301–395)	39.3	717,600	1,486	39.2	40,300	259	40.3	65,000	119	37.2	3,530	825
Office machine operators (341–355)	2.2	40,200	84	2.8	2,900	19	2.5	4,000	10	2.1	200	46
Secretaries, etc. (364–372, 376, 391)	13.0	237,400	504	13.4	13,800	90	11.9	19,200	30	11.7	1,110	260
Banktellers (301)	1.5	27,400	57	1.3	1,300	8	0.9	1,500	2	1.7	160	37
Bookkeepers (305)	3.8	69,400	140	2.7	2,800	19	3.4	5,500	12	3.1	290	71
Cashiers (310)	6.1	111,400	220	5.9	6,100	36	7.5	12,100	22	5.7	540	122
Craftsmen and kindred workers (401–580)	1.8	32,900	66	1.5	1,500	10	1.6	2,600	6	1.9	180	42
Operatives, except transport (601–695)	9.5	173,500	351	10.3	10,600	68	9.6	15,500	28	11.5	1,090	253
Assemblers (602)	1.9	34,700	72	2.4	2,500	16	2.2	3,500	7	1.6	160	36
Dressmakers (613, 633)	1.9	34,700	69	2.2	2,300	14	1.8	2,900	6	2.6	250	58
Laborers, except farm (740–785)	1.2	21,900	45	1.1	1,100	7	0.6	1,000	3	2.0	190	44
Farmers, farm managers, farm laborers, and farm foremen (801–824)	0.9	16,400	34	0.8	800	5	1.3	2,100	3	1.3	120	27
Service workers, except private household (901–965)	15.1	275,700	559	17.6	18,100	111	18.2	29,400	54	15.3	1,450	334

Continued

Table 4. Married women employed at any time during the 12 months before delivery, according to occupation and pregnancy outcome, United States, 1980—Continued

Occupation[1]	All live births			Low birth weight infants			Infants with malformations			Fetal deaths		
	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample	Percent	U.S. estimate	Number in sample
Cleaning service (901–903)	1.3	23,700	47	1.6	1,600	10	2.2	3,500	6	1.9	180	42
Food service (910–916)	6.1	111,400	221	6.9	7,100	43	6.6	10,600	20	5.4	510	116
Health service (921–926)	4.1	74,900	150	4.9	5,000	29	6.4	10,300	20	4.7	450	103
Barbers, hairdressers, and cosmetologists (935, 944)	1.7	31,000	69	2.5	2,600	18	1.9	3,100	5	1.4	130	33
Other occupations (701–715, 980–984)	1.1	20,100	40	1.3	1,300	8	0.7	1,100	2	1.7	160	36

[1] Major occupation groups; selected subgroups and the code numbers listed are those used in the 1970 U.S. Census.
[2] Number of women in sample who gave complete information on type of occupation.

NOTE: Percents do not always total 100 because of rounding. U.S. estimates for major occupation categories may also vary from totals because of rounding.

Table 5. Employment characteristics[1] of married women employed at any time during the 12 months before delivery, according to pregnancy outcome, United States, 1980 (percentages)

Employment characteristic	All live births	Low birth weight infants	Infants with malformations	Fetal deaths
Mothers employed 35 or more hours per week	70.7	75.5	72.5	72.4
Mothers employed at beginning of 2nd trimester[2]	88.4	85.1	83.6	85.7
Mothers employed at beginning of 3rd trimester[2]	72.8	62.1	69.0	61.2

[1] Based on chief job activity during the 12 months before delivery.
[2] Percent based on all mothers employed at their chief job activity at the beginning of the first trimester.

percent of infants with malformations, and 1,110 or 11.7 percent of fetal deaths occurred among secretaries compared with 237,400 or 13.0 percent of the live births. Another large subgroup was cashiers—7.5 percent of infants with malformations, or 12,100 malformed infants, were born to these mothers compared with 6.1 percent of all live births or 111,400 infants.

A large proportion of mothers in all outcome categories were in the professional, technical, and kindred worker occupation group. Their differences among outcome categories were negligible. Preschool, elementary, and secondary school teachers made up the largest professional subgroup; they gave birth to 14,800 infants with malformations (or 9.2 percent) in 1980. This was larger than the proportion of mothers having live-born infants who were employed as teachers (7.4 percent or 135,100 infants). Registered nurses were the second largest professional subgroup; they represented 4.2 percent of all live births to women employed at any time during the year before delivery.

Mothers in the service workers occupation group gave birth to 17.6 percent of the low birth weight infants, 18.2 percent of infants with malformations, 15.1 percent of the live-born infants, and experienced 15.3 percent of the fetal deaths. Subgroups of interest are food service workers and health service workers. Food service work-

ers represented 6.9 percent of low birth weight infants (7,100) compared with 6.1 percent of all live births (111,400). Health service workers gave birth to an estimated 10,300 infants with malformations (6.4 percent) in 1980 in contrast to 74,900 infants, or 4.1 percent of all live births.

For the women employed as operatives, a category that includes assemblers and dress makers, there was little difference in the proportions across the four pregnancy outcomes. An estimated 11.5 percent of fetal deaths occurred to mothers employed as operatives, compared with 9.5 percent of the live births.

Table 5 shows additional employment characteristics of mothers by pregnancy outcome. The proportion of mothers who worked full time (35 hours or more per week) at their chief job activity during the 12 months before delivery was greater among mothers of low birth weight infants (75.5 percent) compared with 70.7 percent of mothers of live-born infants who worked full time.

Of mothers who were employed at the start of their first trimester, 88.4 percent who subsequently had a live birth were still employed at the start of their second trimester, compared with 83.6 percent of mothers with malformed infants, 85.1 percent of those with low birth weight infants, and 85.7 percent of those experiencing fetal deaths. These proportions did not vary much in contrast to the differences among mothers working at the start of the third trimester. At the beginning of their third trimester, a greater proportion of mothers of live-born infants were still working (72.8 percent) compared with only 62.1 percent of those who had low birth weight infants and 61.2 of mothers experiencing fetal deaths.

Tables 6 through 8 show the percentage distribution of maternal demographic, reproductive, and lifestyle characteristics by employment status (employed at any time during the year before delivery versus unemployed) and pregnancy outcome. These specific characteristics were examined because of (*a*) known influence on reproductive outcome as described in the literature or (*b*) interest in describing their relationship to pregnancy outcome and employment. Information obtained on the distribution of these characteristics with respect to employment status and reproductive outcomes will be used in future analyses of this data set as a control measure if there appears to be any confounding with employment.

In contrast to the comparisons of outcome according to mothers' industry and occupation, the demographic, reproductive, and lifestyle proportions that are discussed subsequently are restricted to differences in proportions where the confidence intervals did not overlap.

The proportion of employed married women in the 20–29 year age group was larger than that of unemployed married women for both live births and fetal deaths (table 6). Regardless of employment status, a larger proportion of live births occurred among women 20–29 years old than in any other age group. The proportion of employed mothers 30 years and older was greater for infants with malformations (30.0 percent) and fetal deaths (27.2 percent) compared with all live births (21.1 percent). Among unemployed mothers, 33.9 percent experiencing fetal deaths were 30 years of age or older, compared with 24.6 percent of the mothers of live-born infants.

Table 6. Demographic characteristics of married women according to employment status[1] and pregnancy outcome, United States, 1980

Demographic characteristics and employment status	All live births	Low birth weight infants	Infants with malformations	Fetal deaths
Maternal age				
Employed:				
Under 20 years	8.0	9.6	5.9	8.0
20–29 years	70.9	66.5	64.1	64.8
30 or more years	21.1	23.9	30.0	27.2
Not employed:				
Under 20 years	12.7	17.6	14.0	12.3
20–29 years	62.7	62.4	54.1	53.8
30 or more years	24.6	20.1	31.9	33.9
Maternal race				
Employed:				
White	89.0	82.8	91.3	85.2
Black	8.3	14.6	6.4	12.5
Other	2.7	2.6	2.3	2.3
Not employed:				
White	89.4	81.3	86.8	88.2
Black	7.4	15.9	9.3	9.6
Other	3.2	2.8	4.0	2.3
Maternal education				
Employed:				
0–11 years	9.9	13.9	9.4	13.7
12 years	46.2	47.4	48.6	48.1
13–16 years	36.1	30.9	32.1	31.0
17 or more years	7.8	7.8	9.8	7.2
Not employed:				
0–11 years	26.0	35.2	29.0	30.8
12 years	45.8	42.7	42.1	44.1
13–16 years	24.9	19.7	25.0	21.2
17 or more years	3.3	2.4	3.9	3.9
Total family income				
Employed:				
Under $12,000	19.4	20.3	19.7	21.3
$12,000–$20,999	35.2	35.8	32.8	34.6
$21,000 or more	45.4	43.9	47.5	44.1
Not employed:				
Under $12,000	35.4	42.4	42.2	37.9
$12,000–$20,999	36.1	33.1	34.5	35.3
$21,000 or more	28.5	24.5	23.3	26.8

[1] Employed at any time during the 12 months before delivery versus not employed.
NOTE: Columns do not always add to 100 percent due to rounding.

The greatest proportion of mothers in the study sample were white, with little variation across pregnancy outcome or employment status groups. The proportion of black mothers, however, was greater among mothers of low birth weight infants than among mothers of all live births, regardless of employment status. Among employed women, 14.6 percent of the mothers of low birth weight infants were black, compared with 8.3 percent of the mothers of all live-born infants. Compared with mothers of live-born infants, the proportion of black mothers was also greater among women experiencing fetal deaths whether employed or unemployed.

In all pregnancy outcome categories, a greater proportion of unemployed women had less than a high school education and a family income under $12,000 compared with the corresponding categories of employed women.

The proportion of mothers obtaining early prenatal care was greater among the employed than the unemployed across all pregnancy outcome categories (table 7). A greater proportion of mothers experiencing fetal deaths had late or no prenatal care than did all mothers delivering live-born infants, regardless of employment status (17.1 percent versus 12.3 percent for the employed and 24.4 percent versus 19.3 percent for the unemployed).

Compared with the unemployed, a greater proportion of employed women in all pregnancy outcome groups had no other children living at the time of their 1980 delivery. Among the unemployed, the percent of women with no other children was smaller for women who delivered infants with malformations (14.2 percent) and larger for fetal deaths (29.0 percent) compared with all live births (21.9 percent). These relationships were not as strong for employed women.

The proportion of women with no previous pregnancy was largest among the employed for all pregnancy outcomes (table 7). The proportion of women whose interval since termination of last pregnancy was 2 years or less was smallest for the employed, regardless of pregnancy outcome. Information is not presented for mothers having a fetal death because these data were not available from the fetal death certificate.

Table 8 shows the cigarette, alcohol, and caffeine habits of mothers after their pregnancy was confirmed. A greater proportion of mothers having low birth weight infants smoked cigarettes during pregnancy compared with mothers of all live-born infants. This observation was true for both employed (36.8 percent versus 25.0 percent) and unemployed (44.1 percent versus 25.8 percent) mothers. A greater proportion of employed mothers drank alcohol during pregnancy than did unemployed mothers (49.0 percent versus 38.9 percent for those with live births), regardless of pregnancy outcome. Women experiencing fetal deaths had the smallest percentages of alcohol drinkers. About 65 percent of mothers drank coffee or tea, or both, during pregnancy. This proportion varied little by employment or pregnancy outcome.

Table 7. Reproductive characteristics of married women according to employment status[1] and pregnancy outcome, United States, 1980

Reproductive characteristics and employment status	*All live births*	*Low birth weight infants*	*Infants with malformations*	*Fetal deaths*
Prenatal care				
Employed:				
Early (1–2 months) ..	87.7	82.3	89.9	82.9
Late (3 months or later) or none	12.3	17.7	10.2	17.1
Not employed:				
Early (1–2 months) ..	80.7	74.9	78.7	75.6
Late (3 months or later) or none	19.3	25.1	21.3	24.4
Number of children				
Employed:				
0	52.2	52.1	49.5	55.1
1	30.9	29.6	31.8	24.8
2	11.9	11.4	11.4	12.6
3 or more	5.1	6.8	7.4	7.5
Not employed:				
0	21.9	27.8	14.2	29.0
1	40.0	34.8	42.4	31.4
2	22.6	22.5	26.3	19.6
3 or more	15.5	14.9	17.1	19.9
Interval since last termination				
Employed:				
2 years or less	15.7	17.8	17.5	[2]
More than 2 years ...	33.1	31.9	36.0	
No previous pregnancy	51.3	50.3	46.5	
Not employed:				
2 years or less	32.5	33.9	33.1	[2]
More than 2 years ...	45.2	37.8	53.7	
No previous pregnancy	22.3	28.3	13.3	

[1] Employed at any time during the 12 months before delivery vs. not employed.
[2] Data not available.
NOTE: Columns do not always add to 100 percent due to rounding.

Discussion

For all pregnancy outcome groups, the greatest proportion of women employed at any time during the year before delivery worked in three industry categories: (*a*) professional and related services, (*b*) wholesale and retail trade, and (*c*) manufacturing, and in four occupation categories: (*a*) clerical and kindred workers; (*b*) professional, technical, and kindred workers; (*c*) service workers, except in private households; and (*d*) operatives except those working in transportation.

Compared with unemployed mothers, a larger proportion of employed mothers were between 20–29 years

Table 8. Percentage of married women with selected lifestyle characteristics according to employment status and pregnancy outcome, United States, 1980

Lifestyle characteristics and employment status[1]	All live births	Low birth weight infants	Infants with malformations	Fetal deaths
Smoked cigarettes during pregnancy:				
Employed	25.0	36.8	25.4	28.7
Not employed	25.8	44.1	24.8	30.9
Drank alcohol during pregnancy:				
Employed	49.0	47.6	51.8	41.7
Not employed	38.9	38.5	35.9	32.0
Drank coffee, tea during pregnancy:				
Employed	65.0	67.0	66.1	65.9
Not employed	63.4	61.8	60.4	64.7

[1] Employed at any time during the 12 months before delivery versus not employed.

old, were college educated, had a total family income of $21,000 or more per year, received early prenatal care, had no previous pregnancy, and drank alcohol during pregnancy. Most of these differences were observed in all pregnancy outcome groups. Because these factors were characteristics of employed mothers, it will be important to control for them in future analyses of employment data.

Employment data were available for married mothers only, so these results have certain limitations. In an analysis of the unmarried mothers in the sample, it was found that about 60 percent of the black mothers were unmarried (*6*). In addition, response rates were low for the married black mothers, so that employment data were available for only 25 percent of the black mothers in the sample (*6*).

This limitation suggests that these results may not be representative of all employed mothers. Although the percent of married respondents employed at any time during the year before delivery (62 percent of those delivering live births) is similar to the employment situation for all women aged 20–44 in 1980—66 percent were employed (*11*)—the occupational makeup, demographic characteristics, and other factors in this analysis may differ between survey respondents and all women employed during pregnancy.

The utility of the malformation estimates may be limited because of the emphasis placed on malformations associated with fetal alcohol syndrome. Because they were included in a check list, the fetal alcohol syndrome malformations are more likely to be reported than are other malformations. Overall malformation estimates are therefore based on a disproportionate number of malformations associated with fetal alcohol syndrome and should be used cautiously.

It is anticipated that this preliminary report of the estimated number of women in various industry and occupation groups will contribute to the goal of reducing adverse pregnancy outcomes by defining more clearly the magnitude of the problem. More detailed analyses, controlling for those factors found to be related to both employment and pregnancy outcome, will be performed to assess relationships between industry and occupation and pregnancy outcome.

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