

# Reduction in Newborns With Discharge Coding of In Utero Alcohol Effects in the United States, 1993 to 2002

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**Objective:** To determine whether use of the *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* code for fetal alcohol effects has declined during the past 10 years among hospitalized newborns in the United States.

**Design:** Trends in use of the *ICD-9-CM* code 760.71, "alcohol affecting the fetus," among newborns from 1993 through 2002 were compared with trends in self-reported drinking during pregnancy and maternal diagnoses of alcohol abuse during childbirth.

**Setting:** Sampled short-term, nonfederal general and specialty hospitals.

**Participants:** Infants born from 1993 to 2002 in the United States who were included in the Healthcare Cost and Utilization Project databases.

**Main Outcome Measures:** Documentation of *ICD-9-CM* code 760.71 among newborns, self-reported drinking during pregnancy, and diagnoses of maternal alcohol abuse during childbirth from 1993 through 2002.

**Results:** The prevalence of the *ICD-9-CM* code 760.71 for alcohol affecting the fetus, as documented in the discharge record of newborns, declined from 0.73 (95% confidence interval, 0.56-0.92) per 1000 live births in 1993 to 0.17 (95% confidence interval, 0.13-0.20) per 1000 live births in 2002. Rates declined concurrently with those of self-reported alcohol consumption during pregnancy and diagnoses of maternal alcohol abuse during childbirth.

**Conclusions:** Use of the *ICD-9-CM* code for alcohol affecting the fetus among newborns declined 75% throughout 10 years. Results may be due to decreases in drinking during pregnancy, decreases in disclosure of alcohol use by the mother, or more selective use of the discharge code. National hospital discharge databases may allow cost-effective monitoring of public health interventions that address rare conditions of the fetus and newborn.

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**S**ELF-REPORTED ALCOHOL USE during pregnancy has declined during the past 10 years.<sup>1,2</sup> Comparable longitudinal data on rates of newborns diagnosed as having in utero alcohol effects are not available. Newly developed national hospital discharge databases may allow effective monitoring of fetal alcohol diagnoses. Alcohol affecting the fetus is documented in the newborn medical record as *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* code 760.71. This code is intended to identify "noxious influences affecting fetus or newborn via the placenta or breast milk, specifically alcohol."<sup>3(p485)</sup> The newborn *ICD-9-CM* code may be viewed as a marker for problems associated with in utero exposure to alcohol.<sup>4</sup>

Alcohol effects on the fetus represent a spectrum of structural anomalies and behavioral and neurocognitive disabilities termed *fetal alcohol spectrum disorders*.<sup>5</sup> Children with fetal alcohol spectrum disorder often experience learning disabilities, mental retardation, and behavioral problems throughout life.<sup>6,7</sup> Children at the severe end of the spectrum will meet diagnostic criteria for fetal alcohol syndrome (FAS). Conclusive diagnosis of FAS is often not made until the child is 6 years or older.<sup>8</sup> Fetal alcohol spectrum disorder results directly from maternal alcohol consumption during pregnancy and is completely preventable if a woman does not drink alcohol when she is pregnant. The *ICD-9-CM* code 760.71 applied to the newborn is predictive of later identification of fetal alcohol spectrum disorder.<sup>9,10</sup>

Because earlier identification of infants and children affected by in utero alcohol exposure facilitates earlier referral for needed care, prevention of secondary disabilities, and reduced risk of a subsequent pregnancy affected by alcohol,<sup>11-13</sup> it is important to monitor newborns suspected of alcohol effects or exposure. In this study, we used the Healthcare Cost and Utilization Project (HCUP) series of databases to examine ICD-9-CM diagnoses of 760.71, alcohol affecting the fetus, among hospitalized newborns during a 10-year period from 1993 through 2002. We determined whether changes in estimated rates of these diagnoses differed for white, black, and Hispanic newborns and whether changes were associated with household income. To offer evidence of the concurrent validity of changes in documentation of alcohol affecting the fetus, we assessed co-occurring changes in self-reported drinking during pregnancy based on a national sample and changes in diagnoses of alcohol abuse or dependency documented in the maternal medical record during childbirth.

## METHODS

### DATABASES

Data for this study came from 2 large national hospital discharge databases developed for the HCUP of the Agency for Healthcare Research and Quality (AHRQ) and the Behavioral Risk Factor Surveillance System (BRFSS), a national survey of self-reported behaviors and health risks. The HCUP Nationwide Inpatient Sample (NIS)<sup>14</sup> was used to examine yearly trends in newborn hospitalizations with documented ICD-9-CM code 760.71 for 10 years from 1993 through 2002. The NIS is designed to approximate a 20% stratified random sample of all US community hospitals from states that contribute their State Inpatient Databases to the HCUP. The NIS includes discharge information for all age groups and all payers from each sampled hospital. In 1993, 17 states contributed their data to NIS. In 2002, 35 states contributed data.

Because the NIS samples 20% of hospitals from participating states, some rare conditions of infancy and childhood might not be adequately represented. To guarantee proper sampling of a large number of discharges of infants and children, the AHRQ generated the Kids' Inpatient Database (KID)<sup>15</sup> for discharge years 1997 and 2000. For each year, the KID includes a 10% sample of all healthy newborn hospitalizations and an 80% sample of all other pediatric hospitalizations from short-term, nonfederal general and specialty hospitals. In 1997, 22 states participated in the KID, representing 2521 hospitals and 1.9 million discharge records from children aged 0 to 18 years. In 2000, 27 states participated, representing 2784 hospitals and 2.5 million discharge records from children aged 0 to 20 years. Only newborns (668 956 in 1997 and 784 191 in 2000) were included in this analysis.

The AHRQ has developed discharge weights to generate national estimates of hospitalizations from the NIS and the KID. With these weights, national estimates of hospitalizations and hospitalization rates are comparable across years despite the differing sampling designs of the NIS and KID and the varying number of states participating each year in the HCUP.<sup>14,15</sup> The HCUP databases have been used to generate national rates of newborns with birth defects,<sup>16</sup> study the impact of fortification of grains with folic acid on neural tube defects,<sup>17</sup> study the epidemiologic features of Kawasaki disease,<sup>18</sup> and investigate the hospital management of other rare conditions of infancy and childhood.<sup>19</sup>

Infants in the NIS and KID with the ICD-9-CM newborn discharge code 760.71, "noxious influences affecting fetus or newborn via the placenta or breast milk, specifically alcohol; including fetal alcohol syndrome,"<sup>3(p485)</sup> were identified. The ICD-9-CM code has been used to represent adverse effects on the newborn of maternal alcohol consumption during pregnancy.<sup>20,21</sup> It has been our experience that newborns are given the presumptive diagnosis when long-term alcohol use is documented or strongly suspected in the obstetric record and the newborn is observed to have intrauterine growth retardation, small head circumference, and/or abnormal facial features.<sup>22</sup>

The NIS was also used to determine the number of women with a documented diagnosis of alcohol abuse or dependence during childbirth. Alcohol abuse or dependence was measured by ICD-9-CM diagnosis codes 303.00 to 303.93 or 305.00 to 305.03. Childbirth was identified by diagnosis-related group codes 370 to 375<sup>23,24</sup> or ICD-9-CM V-codes V27.0 to V27.9. The combination of an alcohol-related diagnosis and childbirth-related diagnosis was used to measure changes over time in alcohol abuse diagnoses of the mother during childbirth.

Rates of drinking alcohol during pregnancy were estimated from the BRFSS data. The BRFSS is a national survey conducted yearly and coordinated by the Centers for Disease Control and Prevention (CDC).<sup>25</sup> The BRFSS sampling frame of adults 18 years and older has remained constant during the 10 years of study, thereby allowing comparison of rates over time. Questions are asked about any drinking and binge drinking ( $\geq 5$  drinks at one time) in the past month and current pregnancy. Because no safe threshold of alcohol use during pregnancy has been established<sup>11</sup> and because women are known to underreport the amount of alcohol use during pregnancy,<sup>26</sup> reports of any drinking should be taken seriously.

### STATISTICAL ANALYSIS

Newborn hospitalization rates were calculated per 1000 newborns. Numbers of observed cases with a discharge ICD-9-CM diagnosis of 760.71 (alcohol affecting the fetus) were first computed from the NIS and the KID. Weights were then applied to the observed cases to derive national estimates. Similarly, numbers of all newborns were computed from the NIS and the KID, then weighted up to represent all hospital births in the United States. This value forms the denominator in the calculation of ICD-9-CM diagnosis rates per 1000 newborns. Statistical analyses were completed with Stata statistical software, version 8.0 (StataCorp, College Station, Tex), to take into account the complex sampling designs and sample weights of the NIS and the KID. The SVYRATIO command was used to calculate the proportion of newborn hospital births with ICD-9-CM documentation of alcohol affecting the fetus and associated 95% confidence intervals for both overall yearly rates and subpopulation rates. Differences in rates across years were compared using the LINCOM command. Ten-year trends toward decreasing (or increasing) rates were tested for significance with the Cochran-Armitage trend test.

Income is defined in the NIS and the KID as the median income of households in the census tract of residence of the patient. Income was classified for our analyses into 3 categories roughly corresponding to the top, middle, and bottom third of the income distribution each year. For example, in 2000 the top third of the distribution included households from census tracts with a yearly income of \$45 000 or more. The middle third included households from tracts with a yearly income of \$35 000 to \$44 999. The bottom third included households from census tracts with a yearly income of less than \$35 000.

Three mutually exclusive racial/ethnic codes (white, black, and Hispanic) are available in the NIS and the KID with suffi-

**Table 1. Rates of Documentation of Discharge Code 760.71 (Alcohol Affecting the Fetus) Among Hospitalized Newborns by Ethnicity, 1993-2002\***

Ethnicity	Rate (95% Confidence Interval)				
	1993	1994	1995	1996	1997
All	0.73 (0.56-0.92)	0.62 (0.51-0.73)	0.56 (0.47-0.66)	0.53 (0.44-0.63)	0.48 (0.40-0.56)
White	0.53 (0.34-0.71)	0.38 (0.29-0.46)	0.41 (0.33-0.48)	0.41 (0.31-0.51)	0.36 (0.28-0.43)
Black	2.03 (1.34-2.72)	1.93 (1.39-2.47)	1.65 (1.15-2.15)	1.44 (1.10-1.78)	1.23 (0.95-1.51)
Hispanic	0.25 (0.11-0.39)	0.25 (0.11-0.39)	0.32 (0.21-0.43)	0.29 (0.11-0.36)	0.19 (0.10-0.28)

(continued)

cient numbers of cases to allow for meaningful stratified analyses. Race-specific rates of alcohol affecting the fetus were calculated per 1000 newborn hospitalizations.

Some newborns require more intensive medical management owing to a variety of conditions and thus may be transferred from the birthing hospital to another acute care inpatient facility. To avoid double-counting these newborn cases, age of admission was limited to a maximum of 10 days, and those whose hospital disposition was listed as transferred to another short-term, acute care hospital were excluded from computation of rates.<sup>27</sup> These patients would likely be included (a single time) based on the discharge diagnosis from the hospital to which the newborn was transferred.

Numbers of maternal alcohol-related diagnoses were identified from the NIS. Weights were applied to the observed cases to derive national estimates and 95% confidence intervals per 1000 hospital births. The BRFSS databases for the years 1993 to 2002 were accessed to compute the percentage and 95% confidence intervals of pregnant women who reported any alcohol consumption during the past month.

## RESULTS

Estimated rates of ICD-9-CM code 760.71 documentation per 1000 live hospital births are presented in **Table 1**. In 1993, 2746 of 3 741 144 live births in the United States (0.73 per 1000 live births) received the discharge diagnosis. In 2002, 684 of 4 148 092 live births (0.17 per 1000 live births) received the diagnosis. This finding represents more than a 75% reduction in the rate of documentation of the 760.71 code during the study period. Documentation of code 760.71 among black newborns is approximately 4 times the rate for white newborns across 10 years of births. Hispanic newborns consistently have lower rates than black or white newborns. Cochran-Armitage trend tests confirm statistically significantly ( $P < .001$ ) decreasing rates for the total and for each racial group.

Declines in estimated rates of documentation of alcohol affecting the fetus across time are depicted in **Figure 1** separately for white, black, and Hispanic newborns. The decline is most apparent among black newborns, although rates for all groups have decreased substantially during the decade examined.

In **Figure 2**, rates are presented separately for high, middle, and low income categories of infants. Across years, rates of documentation of alcohol affecting the fetus are highest for the lowest income category and lowest for the highest income category. Rates have declined consistently across each income category, most precipitously

among those from areas with lower income. Cochran-Armitage trend tests confirm statistically significant ( $P < .001$ ) decreases for each income category.

In **Table 2**, estimated rates of ICD-9-CM code 760.71 documented in the newborn medical record are presented for years 1997 and 2000 and are stratified by race and income. Absolute rates of the diagnosis have decreased most strikingly for lower-income black newborns (from 1.82 to 0.93 per 1000 live births;  $P = .02$ ). Significant relative reductions in rates are also seen for middle- and higher-income white newborns. Rates for lower-income white newborns and middle- or higher-income black newborns were not significantly lower in 2000 than in 1997. Rates did not change significantly during this 4-year period for Hispanic newborns in any income category.

**Figure 3** presents estimated rates of diagnosis of alcohol affecting the fetus among hospitalized newborns superimposed on rates of drinking during pregnancy derived from the BRFSS<sup>25</sup> and rates of maternal alcohol abuse or dependence diagnoses during childbirth computed from the NIS. Rates of documentation of the ICD-9-CM code for alcohol affecting the fetus have declined concurrently with trends in drinking during pregnancy and trends in alcohol abuse or dependence diagnoses of the mother during childbirth. Cochran-Armitage trend tests confirm statistically significant ( $P < .001$ ) decreases in drinking and alcohol diagnoses.

In **Figure 4**, estimated rates of documentation of alcohol affecting the fetus among hospitalized newborns derived from the NIS are presented along with comparable rates among hospitalized newborns generated from the CDC Birth Defects Monitoring Program (BDMP).<sup>28-30</sup> The BDMP, active from 1979 through 1993, relied on hospital discharge data contributed on a voluntary basis by participating hospitals. As seen from this figure, rates of documentation of code 760.71, as reported by the BDMP, were 0.10 per 1000 live births in 1979 and increased to 0.67 per 1000 live births by 1993.<sup>20,21</sup> By comparison, NIS-based rates begin at 0.36 per 1000 live births in 1988, peaking at 0.73 in 1993, then declining to 0.17 by 2002.

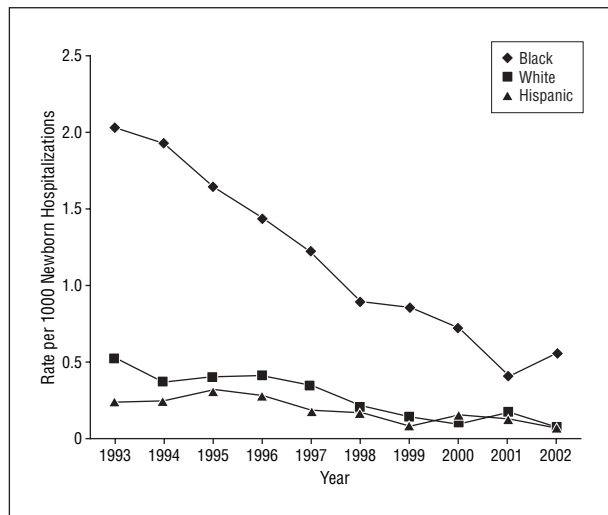
## COMMENT

Our study demonstrated a decline in the number of newborns with a discharge ICD-9-CM diagnosis of 760.71 (alcohol affecting the fetus) during the past decade: a 75%

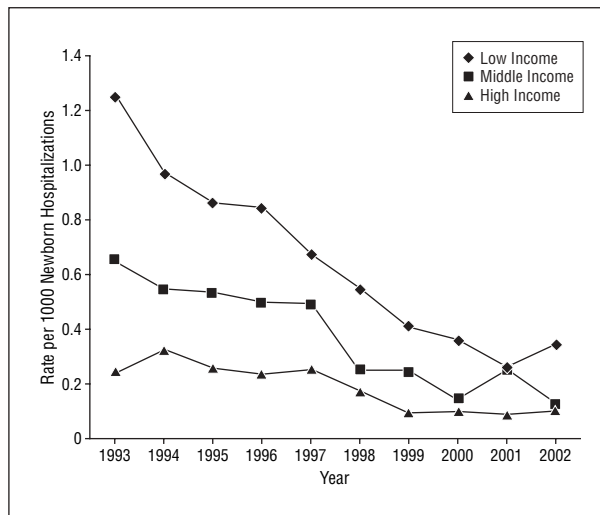
**Table 1. Rates of Documentation of Discharge Code 760.71 (Alcohol Affecting the Fetus) Among Hospitalized Newborns by Ethnicity, 1993-2002 (cont)\***

Ethnicity	Rate (95% Confidence Interval)				
	1998	1999	2000	2001	2002
All	0.34 (0.27-0.41)	0.25 (0.20-0.31)	0.21 (0.17-0.24)	0.18 (0.14-0.22)	0.17 (0.13-0.20)
White	0.21 (0.15-0.27)	0.15 (0.10-0.19)	0.11 (0.08-0.14)	0.18 (0.11-0.24)	0.08 (0.05-0.11)
Black	0.90 (0.56-1.23)	0.87 (0.48-1.26)	0.73 (0.52-0.93)	0.41 (0.22-0.60)	0.56 (0.39-0.74)
Hispanic	0.18 (0.09-0.26)	0.09 (0.03-0.14)	0.16 (0.10-0.22)	0.13 (0.07-0.19)	0.08 (0.03-0.13)

\*Data are from the Healthcare Cost and Utilization Project, Nationwide Inpatient Sample, 1993-2002. Rates are per 1000 live hospital births. Code 760.71 is from the *International Classification of Diseases, Ninth Revision, Clinical Modifications*.



**Figure 1.** Rates of documentation of *International Classification of Diseases, Ninth Revision, Clinical Modification* code 760.71 (alcohol affecting the fetus) among hospitalized newborns by ethnicity, 1993 through 2002. Data are from the Healthcare Cost and Utilization Project, Nationwide Inpatient Sample.



**Figure 2.** Rates of documentation of *International Classification of Diseases, Ninth Revision, Clinical Modification* code 760.71 (alcohol affecting the fetus) among hospitalized newborns by income, 1993 through 2002. Data are from the Healthcare Cost and Utilization Project, Nationwide Inpatient Sample.

reduction was observed from 1993 to 2002. Our results are consistent with a prior study<sup>31</sup> of infants born at Albert Einstein College of Medicine-affiliated hospitals from 1985 through 1996 and a study<sup>2</sup> documenting a declining prevalence of FAS in Washington state from 1993 to 1998. Our findings are also consistent with longitudinal data from the BDMP that measured earlier trends in diagnosis of alcohol affecting the fetus.<sup>20,21</sup>

Declines in use of the diagnosis for alcohol affecting the fetus were seen among white, black, and Hispanic newborns, but a far greater absolute decline was seen among black newborns. Within racial categories, rates declined significantly among lower-income black newborns and middle- and higher-income white newborns. Reductions in rates of documentation of alcohol affecting the fetus in the medical record paralleled reduced drinking during pregnancy and reduced maternal diagnosis of alcohol abuse and dependence during childbirth.<sup>1,25</sup>

Several explanations for these findings should be considered: (1) changes in preference for the discharge diagnosis code among health care professionals or coders, (2) changes in mothers' disclosure of alcohol use during pregnancy, and (3) changes in exposure to alcohol during pregnancy. The newborn diagnosis code 760.71

specifies only that an infant has been affected by alcohol. It is possible that health care professionals and coders have come to avoid this code. Public health campaigns and professional education may have altered the attitudes of health care professionals, making them increasingly less likely to apply a diagnosis that may be somewhat uncertain and potentially stigmatizing. Similarly, coders may have discontinued use of the code if insurers increasingly refused to pay for fetal alcohol-related hospital care.<sup>22</sup> We are not aware of evidence supporting this selective coding explanation.

The results we observed may be due to increased underreporting of alcohol use during pregnancy. Documentation of alcohol effects in the newborn medical record often depends on maternal self-report of drinking or documentation of alcohol use during pregnancy in the obstetric medical record. Underreporting of alcohol use during pregnancy is known to occur.<sup>26</sup> Maternal knowledge of the potential harmful effects of alcohol on the infant and potential loss of custody of the child if alcohol use is discovered may result in nondisclosure of drinking during pregnancy. It is not known whether nondisclosure has increased sufficiently during the study period to explain our findings. Related evidence suggests that

**Table 2. Rates of Documentation of Discharge Code 760.71 (Alcohol Affecting the Fetus) Among Hospitalized Newborns by Ethnicity and Income, 1997 and 2000\***

Ethnicity and Income Category	Rate (95% Confidence Interval)		P Value
	1997	2000	
White	0.22 (0.18-0.26)	0.15 (0.13-0.17)	.007
Low	0.23 (0.16-0.29)	0.25 (0.20-0.30)	.57
Middle	0.30 (0.19-0.40)	0.17 (0.12-0.21)	.02
High	0.16 (0.12-0.20)	0.08 (0.06-0.11)	.003
Black	1.22 (0.81-1.62)	0.80 (0.66-0.94)	.06
Low	1.82 (1.07-2.58)	0.93 (0.72-1.13)	.02
Middle	0.78 (0.60-0.96)	0.74 (0.47-1.00)	.80
High	0.42 (0.28-0.56)	0.45 (0.35-0.55)	.73
Hispanic	0.14 (0.12-0.16)	0.15 (0.13-0.17)	.48
Low	0.16 (0.14-0.19)	0.18 (0.14-0.21)	.49
Middle	0.15 (0.11-0.19)	0.11 (0.08-0.13)	.08
High	0.12 (0.08-0.16)	0.15 (0.13-0.18)	.18

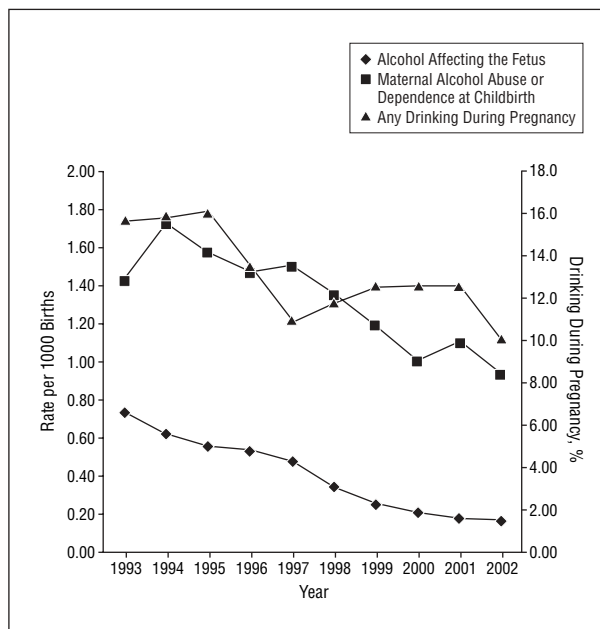
\*Data are from the Healthcare Cost and Utilization Project, Kids' Inpatient Database, 1997 and 2000. Rates are per 1000 live hospital births. Code 760.71 is from the *International Classification of Diseases, Ninth Revision, Clinical Modification*.

the impact of public health messages about the effects of alcohol during pregnancy has been unchanged during the course of our study.<sup>32,33</sup>

Use of any alcohol during pregnancy and maternal diagnoses of alcohol abuse or dependence have declined in parallel with rates of documentation of ICD-9-CM code 760.71. To support our BRFSS findings, data from the Pregnancy Risk Assessment and Surveillance program in 12 states with longitudinal data show that rates of self-reported drinking during the last 3 months of pregnancy declined significantly from 1993 to 1999 in 7 states. Drinking declined, although not significantly, in the remaining 5 states.<sup>1</sup> Drinking during the 3 months before conception, perhaps most representative of behavior during the early weeks of pregnancy before a woman is aware she is pregnant, declined significantly only in Washington state.<sup>1</sup> Public health campaigns, prenatal screening for drinking during pregnancy, and warning labels on bottles have had significant effects on drinking during pregnancy<sup>33-37</sup> and may partly explain our results.

Data on heavy or risky drinking patterns during pregnancy from the BRFSS show that self-reported binge drinking during pregnancy has not declined during the past 10 years.<sup>25</sup> These data are not consistent with our findings.

Our results point to the need for better surveillance of the effects of alcohol on the fetus in the United States. Currently, cases of FAS are reported to the National Birth Defects Prevention Network by participating states on a voluntary basis. State surveillance systems vary greatly in how aggressively cases of FAS are ascertained. As of 2004, 23 states did not collect data on FAS and 10 states relied exclusively on discharge data provided by hospitals.<sup>38</sup> Although fetal alcohol spectrum disorder continues to have a great impact on families, the health care system, and the educational system, we are currently without a comprehensive, well-funded program to monitor our prevention efforts in this regard. If rates of FAS are

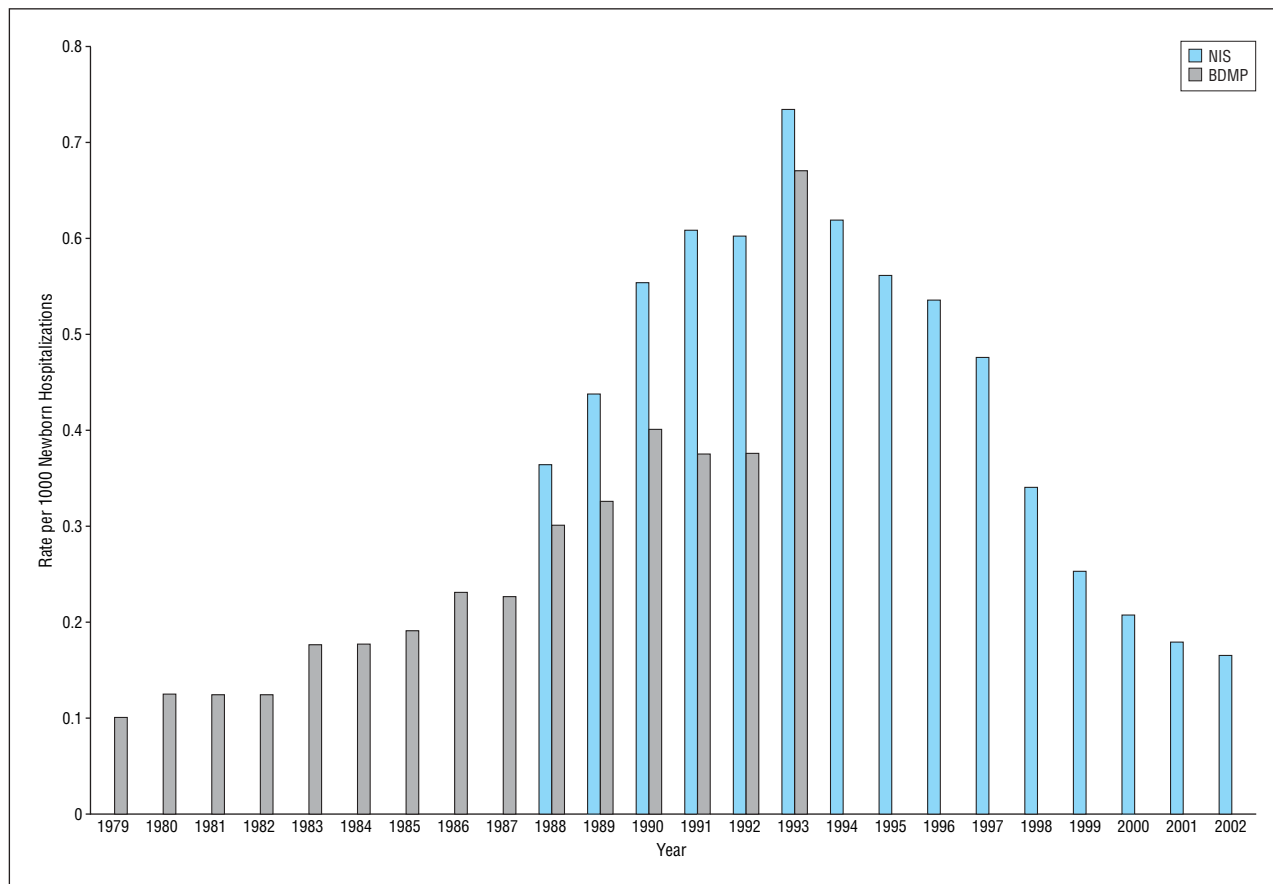


**Figure 3.** Rates of documentation of *International Classification of Diseases, Ninth Revision, Clinical Modification* code 760.71 (alcohol affecting the fetus), alcohol abuse or dependence during childbirth, and any alcohol consumption during pregnancy, 1993 through 2002. Rates of alcohol affecting the fetus and maternal alcohol abuse or dependence are from the Nationwide Inpatient Sample, 1993 through 2002; alcohol use rates are from the Behavioral Risk Factor Surveillance System, 1993 through 2002.

declining along with rates of newborns identified as affected by alcohol, uniform active case ascertainment systems would greatly improve our ability to identify responsible protective factors. A program in place in Washington state since 1997 uses facial photographic software and a 4-digit diagnostic code to ascertain cases of FAS among birth cohorts entering foster care. Findings from this model program have shown decreases in rates of FAS from 1993 to 1998 that parallel decreases in maternal alcohol use during pregnancy as reported to the Pregnancy Risk Assessment and Surveillance program.<sup>2</sup> As an alternative to this labor-intensive state ascertainment program, hospital discharge databases may represent a cost-effective method of monitoring national changes in the number of infants affected by maternal alcohol use over time.

The limitations of our study should be acknowledged. Because we have used an ecological design, we have no direct evidence in our analysis that cases of newborn hospitalizations with a documentation of ICD-9-CM 760.71 (alcohol affecting the fetus) were exposed to alcohol. We are unable to state that women who over time delivered fewer infants affected by alcohol were those who consumed less alcohol during pregnancy.

We are also limited by the use of the ICD-9-CM code. Dysmorphic features typical of older children with fetal alcohol spectrum disorders are not required for this code. The Institute of Medicine-based case definition of FAS used by many fetal alcohol spectrum disorders researchers<sup>39-42</sup> and the more recent CDC definition<sup>8</sup> require documentation by a physician of abnormal facial features consistent with FAS (including short palpebral fissures, abnormal philtrum, and thin upper lip), central ner-



**Figure 4.** Rates of documentation of *International Classification of Diseases, Ninth Revision, Clinical Modification* code 760.71 (alcohol affecting the fetus) among hospitalized newborns, 1979 through 2002. Data from 1979 through 1993 are from the Centers for Disease Control and Prevention Birth Defects Monitoring Program (BDMP); data from 1988 through 2002 are from the Nationwide Inpatient Sample (NIS).

vous system abnormalities (including small head circumference, developmental delay, and mental retardation), and growth retardation (including low birth weight and delayed postnatal growth). Most of these criteria cannot be assessed reliably in the newborn period.<sup>43-47</sup> Typically, FAS is identified and diagnosed in the preschool or early school years.<sup>8</sup> Fox and Druschel<sup>9</sup> found that only 44% of cases identified by the *ICD-9-CM* newborn code were confirmed as cases of FAS by the age of 2 years and that only 56% of confirmed cases of FAS based on Institute of Medicine criteria were first recognized at birth. Although not meeting syndrome criteria, most neonates with the discharge code of alcohol affecting the fetus have growth deficiencies, central nervous system impairment, and documented maternal alcohol consumption during pregnancy, suggesting that the diagnosis might best be viewed as a marker for problems associated with in utero exposure to alcohol.<sup>4</sup>

The newborn *ICD-9-CM* code can also be the basis of referral for needed early intervention. The *ICD-9-CM* code of alcohol affecting the fetus is considered a “presumptive eligibility” diagnosis in Part C of the federal Individuals With Disabilities Education Act. This diagnosis allows children from birth to 3 years of age who are “at risk” of later developmental delay to receive early intervention services without meeting more stringent eligibility criteria of significant developmental delay.<sup>8</sup>

Rates of alcohol affecting the fetus at birth are known to miss many cases of FAS identified as the child ages.<sup>9</sup> Estimates of the number of infants and children who meet full criteria for FAS have proved elusive even with the best of surveillance methods. Rates vary between and within types of state surveillance systems and between clinic-based studies and surveillance studies.<sup>48</sup> Rates per 1000 live births vary across existing studies by a factor of 10 or more.<sup>48</sup> The NIS- and KID-based rates of alcohol affecting the fetus, although limited to the newborn period, have the advantage of a standardized collection method across millions of hospital discharges per year mandated by state participation in the federal Medicaid program. Yearly rates generated from the NIS may be the most accurate current means of monitoring the rate of fetal alcohol effects over time.

In conclusion, the coded diagnosis of alcohol effects among newborns has decreased significantly during the past 10 years. Further research is required to determine the importance of decreases in risky drinking behavior, changes in maternal disclosure of drinking to health care professionals, and changes in hospital coding tendencies as explanations for this finding. Large-scale discharge databases such as the NIS and KID may provide a cost-effective method of monitoring the success of public health interventions that address rare conditions that affect the newborn.

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#### Trial Registration Required

In concert with the International Committee of Medical Journal Editors (ICMJE), *Archives of Pediatrics and Adolescent Medicine* will require, as a condition of consideration for publication, registration of all trials in a public trials registry (such as <http://ClinicalTrials.gov>). Trials must be registered at or before the onset of patient enrollment. This policy applies to any clinical trial starting enrollment after July 1, 2005. For trials that began enrollment before this date, registration will be required by September 13, 2005, before considering the trial for publication. The trial registration number should be supplied at the time of submission.

For details about this new policy, and for information on how the ICMJE defines a clinical trial, see the editorials by DeAngelis et al in the September 8, 2004 (2004;292:1363-1364) and June 15, 2005 (2005;293: 2927-2929) issues of *JAMA*. Also see the Instructions to Authors on our Web site: [www.archpediatrics.com](http://www.archpediatrics.com).