Validity of Insurance Information on California Birth Certificates

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ABSTRACT

Objectives. This study assessed the validity of health insurance information on California birth certificates.

Methods. Insurance information from birth certificates and linked face-to-face interviews was compared for 7428 postpartum women in California.

Results. There was excellent agreement between insurance information in birth certificate and interview data, especially when capitated plans were grouped with all other private coverage. Analyses using both data sources produced similar estimates of the likelihood of untimely prenatal care according to type of insurance coverage.

Conclusions. Birth certificate data including insurance information appear to be an appropriate resource for examining both the extent of coverage for maternity care and associations between prenatal care use and insurance status. (*Am J Public Health*. 1998;88: 813–816)

Introduction

In January 1989, information on insurance coverage for maternity care was added to the confidential section of California birth certificate records. As of August 1997, 10 other states also included insurance coverage information in birth records (G. Tolson, National Center for Health Statistics, oral communication, August 1997). Because birth registration is nearly universal, birth records including insurance data provide the only ongoing population-based source of information on third-party coverage for maternity care at the state and county levels. State-level estimates of coverage for maternity care are available for approximately 15 states that participate in the ongoing Pregnancy Risk Assessment Monitoring System of the Centers for Disease Control and Prevention (CDC), but the sampling used in this monitoring system does not allow for reliable county-level or small subgroup analyses (C. Johnson, CDC, written communication, July 1997). Insurance information in birth records also permits study of how third-party coverage relates to receipt of prenatal care and to birth outcomes after controlling for a range of sociodemographic and medical factors also described in birth records. Because collecting birth certificate data does not require special funding for expensive surveys, birth records are an important source of ongoing data needed to inform policies designed to achieve optimal health outcomes and use of care.

Although demographic and medical information from birth certificates has been validated via comparisons with various data sources,[1–7] studies validating insurance information from birth certificates have not previously been published. We assessed the validity of the insurance information from California birth certificates, both to increase its usefulness in California and to inform consideration of its adoption in other states and at the national level.

Methods

Data Sources

Birth records were matched with data from face-to-face, structured postpartum interviews to allow comparison of reported insurance coverage between the 2 data sources. The interviews were part of a larger study of prenatal care use among women in diverse income and insurance subgroups. For validation analyses, we used information on insurance status before, during, and after pregnancy collected from 7633 women at 16 delivery hospitals across California between August 1994 and July 1995. Birth records were retrieved from the Automated Vital Statistics System[8] and California Automated Registration and Entry, 2 electronic birth certificate computer systems.[9] Interview data were linked with birth certificate files by means of an algorithm developed by Ronald Williams and colleagues at the University of California, Santa Barbara. (Details on survey methods and the matching algorithm are available on request.) We successfully matched 97.3% of the survey records with corresponding birth certificates, creating a final data set with 7428 observations; women with matched and nonmatched records had similar sociodemographic characteristics. To examine the range of procedures used to collect birth certificate data, we also interviewed birth clerks at the study hospitals after the postpartum survey had been completed.

Categorization of Insurance

The California birth certificate includes both principal source of payment for prenatal care, defined as the payment source "which will pay the greatest share of the mother's bill for prenatal care," and expected principal source of payment for delivery.[10] Although separate codes are listed for "private," Blue Cross, and HMO/prepaid health plans, guidelines are not provided for distinguishing prepaid from other private plans, for determining whether

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private coverage was obtained via Medi-Cal, or for coding insurance for women with pending Medi-Cal coverage. Women who received no prenatal care are not asked about prenatal coverage; for these women, delivery coverage was analyzed as a proxy for prenatal coverage.

Survey respondents were asked to identify their health insurance plan(s) before pregnancy, during pregnancy, and for delivery. A woman with private coverage was further classified as having capitated, fee-for-service, or unspecified private coverage. The survey coded as Medi-Cal covered those women in private plans who received coverage through Medi-Cal. When a woman had more than one coverage concurrently during pregnancy, the one that paid the most was considered her principal coverage. If her coverage changed during pregnancy, the one she had longest was considered primary. If a woman had applied for Medi-Cal for prenatal care but not received her Medi-Cal card by the postpartum interview, she was coded as having Medi-Cal coverage during pregnancy unless she considered herself uninsured, in which case she was coded as uninsured. When a woman indicated that her Medi-Cal coverage for delivery was pending, she was categorized as having Medi-Cal delivery coverage. Women who received no prenatal care were asked about coverage that would have paid for prenatal care.

Statistical Analyses

We examined both the percentage agreement and kappa coefficient for each comparison of insurance coding in the 2 data sources using SAS software.[11] Prenatal coverage comparisons included women with no prenatal care; survey information on the coverage that would have paid for prenatal care, and birth certificate information on delivery coverage, were used as proxy for prenatal coverage. Percentage agreement was defined as the percentage of survey responses within a specific insurance category that were coded in the same insurance category on birth certificates. The kappa coefficient,[12,13] which adjusts overall percentage agreement for possible agreement by chance, is an accepted measure of agreement when neither data source is the standard. As a general rule, a kappa coefficient of .75 or higher reflects excellent agreement between 2 data sources.[13] While a high level of agreement lends credibility to that item in both sources, lack of agreement could reflect error in either source. Kappa coefficients are presented with 95% confidence intervals (CIs).

To explore how using data from different sources might affect analytic conclusions, we compared estimates of the association between insurance and untimely initiation of prenatal care derived from separate analyses of insurance data from the 2 sources. Multivariate analyses, based on a logistic regression model from an earlier study conducted by Braveman et al.,[14] included insurance data first from birth certificates and then from the survey, with all other variables defined as reported on birth certificates; these analyses included women who did not receive prenatal care.

Results

Agreement between Birth Certificate and Survey Data

Table 1 displays insurance distributions for prenatal care and delivery according to each data source, with corresponding measures of agreement. For each insurance category, kappa coefficients were at least .80, indicating excellent agreement. Agreement between the survey and birth certificates was comparable for prenatal care and delivery coverage and showed significant improvement when private capitated and fee-for-service coverage were combined into a single private coverage category.

Although the kappa coefficients indicated excellent agreement between sources for insurance categories overall, the percentage agreement rates varied for specific insurance subgroups. In particular, birth certificate data suggested that 1.4% of pregnant women lacked coverage, while roughly twice that proportion (2.7%) of women considered themselves uninsured during pregnancy according to the postpartum survey. Other discrepancies between the data sources were as follows: (1) among women with private coverage, more were coded in survey data as having capitated coverage; (2) women with pending Medi-Cal coverage were more likely to be coded as Medi-Cal covered in birth certificate data and less likely to be coded as uninsured; (3) women with private capitated coverage funded by Medi-Cal were coded differently in the 2 sources; and (4) more women were coded in survey data

TABLE 1—Distribution of Insurance for Prenatal Care and Delivery according to Birth Certificate and Survey Data, with Measures of Agreement: California, 1994/95

Insurance Category	Data Source: Birth Certificate, %	Data Source: Postpartum Survey, %	Agreement between Sources, %[a]
	Prenatal coverage[b] (including women with no prenatal care[c]) (n = 7357)		
Private	47.4	46.6	97.4
Capitated	35.7	40.0	84.2
Other private	11.7	6.6	79.3
Medi-Cal	49.5	48.7	95.9
Other	1.7	2.0	75.3
Uninsured	1.4	2.7	33.7
	Delivery coverage[d] (n = 7250)		
Private	47.7	46.7	98.4
Capitated	36.0	40.1	85.2
Other private	11.7	6.6	80.5
Medi-Cal	49.2	49.9	95.8
Other	1.7	1.8	82.7
Uninsured	1.4	1.5	44.3

[a]Percentage of survey responses with which birth certificate data agreed.
[b]K for private combined = .90 (95% CI = .89, .91); K for private separate = .80 (95% CI = .79, .82).
[c]For birth certificate data, prenatal coverage inferred from delivery coverage for women with no prenatal care.
[d]K for private combined = .92 (95% CI = .92, .93); K for private separate = .83 (95% CI = .81, .84).

as having different coverages for prenatal care and for delivery.

In addition, as can be seen in Table 2, measures of agreement varied according to the birth certificate data collection procedures followed by hospitals. When birth clerks used women's self-reports, as the postpartum survey did, the correspondence between the 2 sources was significantly higher ($P < .005$).

Analyses of Untimely Prenatal Care Using Birth Certificate vs Survey Data

Table 3 shows how, depending on the source of insurance information, initiation of prenatal care after the first trimester varied by insurance coverage. The percentages of women receiving untimely care were similar in each insurance category except the uninsured group; a higher percentage (60.7%) of women coded as uninsured in the survey data had untimely prenatal care than did women coded as uninsured in birth certificate data (46.6%). Odds ratios estimating the association between insurance coverage and untimely care adjusted for sociodemographic characteristics did not differ significantly between birth certificate data and survey data.

Discussion

The overall distributions of insurance coverage for prenatal care and delivery are similar in California birth certificate data and in data from our statewide postpartum survey. Despite the generally high level of agreement between these data sources by insurance type, however, researchers and program planners in California should be aware of potentially important caveats indicated by our findings.

First, the extent of capitated private coverage is likely to be underestimated in birth certificate data, at least in part because birth certificate codes do not clearly distinguish between capitated and noncapitated coverage; insurance information from the birth certificate is probably more accurate when the HMO/capitated and private insurance categories are collapsed into a single category. Second, the number of women uninsured for prenatal care may be underestimated in birth certificate data. Medi-Cal may be incorrectly coded as the prenatal payer for women who had not received their Medi-Cal cards before delivery, and birth clerks may impute prenatal coverage for women without prenatal care based on their delivery coverage. Similarly, if a woman's coverage changes during pregnancy, prenatal coverage on the birth certificate may reflect the last coverage or delivery coverage instead of the principal prenatal payer. Finally, women with private coverage paid for by Medi-Cal may not be counted as having Medi-Cal coverage in birth certificate data.

Although neither data source used in this study can be regarded as a "gold standard" for measuring insurance coverage, we believe that the insurance information obtained in the postpartum survey is more likely to be accurate, given differences in standardization, quality control, and specificity of information. The quality of birth certificate data could be further improved by standardizing procedures to (1) obtain information on coverage during pregnancy from women who received no prenatal care; (2) distinguish subtypes of private coverage, perhaps by assigning unique codes to individual plans; (3) specify women with pending Medi-Cal coverage at delivery; (4) identify the primary prenatal payer when coverage has changed during pregnancy; and (5) identify Medi-Cal enrollees in private plans. Uniform standards should be created for data collection procedures, birth clerk training and periodic retraining, and quality assurance.

Even as currently collected in California with limited quality control, vital records provide a unique population-based, annual, publicly available data source rich in sociodemographic, medical care, and health status information. Insurance information in birth certificate data permits ongoing monitoring of financial access to care, with the ability to adjust for and examine the role of a range of other factors that, along with financial access, could influence prenatal care use. Our findings suggest that discrepancies in insurance information between the data sources do not lead to substantially different public policy conclusions regarding the receipt of timely prenatal care among women with different types of coverage. Given the uniqueness of birth certificate data as a resource for monitoring the effects of public policies, and in light of these findings, inclusion of third-party coverage information in confidential birth certificate records on a nationwide basis should be seriously considered. □

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TABLE 2—Agreement between Birth Certificates and Survey Data by Birth Clerk's Mode of Data Collection: California, 1994/95

Mode of Birth Certificate Data Collection	Agreement with Survey Data, K (95% Confidence Interval)	
	Prenatal Payer	Delivery Payer
Chart abstraction	.74 (.71, .76)	.74 (.72, .77)
Woman's self report	.87 (.86, .89)	.89 (.88, .90)
Combination	.74 (.72, .77)	.76 (.74, .79)

TABLE 3—Likelihood of Untimely Initiation of Prenatal Care by Type of Insurance Coverage, According to Birth Certificate and Postpartum Survey Data: California, 1994/95

Type of Prenatal Insurance Coverage	Data Source for Insurance Coverage			
	Birth Certificates		Postpartum Survey	
	Untimely[a] Care, %[c]	Adjusted[b] Odds Ratio (95% CI)	Untimely[a] Care, %[c]	Adjusted[b] Odds Ratio (95% CI)
Capitated	7.9	1.00 . . .	8.2	1.00 . . .
Other private	12.5	1.77 (1.37, 2.29)	14.2	1.91 (1.42, 2.57)
Medi-Cal	39.0	5.82 (4.87, 6.94)	37.7	5.21 (4.40, 6.17)
Uninsured	46.6	8.48 (5.78, 13.54)	60.7	14.01 (10.05, 19.53)

Note. CI = confidence interval.
[a]Lack of prenatal care in the first trimester, including no care, as recorded on the birth certificate.
[b]Adjusted for race/ethnicity, nativity, parity, education, and age, as recorded on the birth certificate.
[c]Unadjusted.

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Decrease in Infant Mortality in New York City after 1989

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ABSTRACT

Objectives. This study identified factors contributing to the rapid decline in infant mortality in New York City from 1989 to 1992.

Methods. Changes in birthweight distributions and in birthweight/age–, cause-, and birthweight/age/cause–specific mortality rates from 1988/89 (before the mortality reduction) to 1990/91 were identified from New York City vital statistics data.

Results. Infant, neonatal, and postneonatal mortality of very-low-birthweight (<1500 g) and normal-birthweight infants decreased significantly. The declines were almost entirely due to decreases in birthweight-specific mortality rates, rather than increased birthweights. All races experienced most of these reductions. Mortality decreased significantly for 6 causes of death. These decreases were consistent with the birthweight/age groups experiencing mortality declines.

Conclusions. Widespread, multiple perinatal and postnatal factors contributed to the decline in infant mortality. (*Am J Public Health.* 1998;88:816–820)

Introduction

From 1965 through 1984 the New York City infant mortality rate fell from 25.7 to 13.6 per 1000 live births, at an average rate of about 2.4% per year, but for the next 5 years the annual rate of decline slowed to less than 0.5%. Then, from 1989 to 1992, the rate fell by about 5.8% per year, from 13.3 to 10.2. This recent decrease is of interest because of its strength and its similarity to the national trend. There was a rapid decline in US infant mortality after 1989, mainly because of falling deaths from respiratory distress syndrome (RDS), congenital anomalies, and residual causes.[1,2] These findings could be real, or they could be due to the short period of observation or inaccuracies in the diagnosis and certification of death.[3]

New York City linked birth/infant death records provide an opportunity to examine the relative impact on infant mortality of changes in birthweight and birthweight-specific mortality, as well as to evaluate data on cause-of-death trends and to examine these trends by birthweight and age at death. We characterized the factors contributing to the decline in the infant mortality rate in New York City and identified areas requiring more specific investigation.

Methods

Birthweight and Mortality Trends

Birth and linked birth/infant death files were used to compare the 269 899 births and 3597 infant deaths in 1988/89 (before the mortality decline) with the 277 778 births and 3195 infant deaths in 1990/91. Birthweight distributions and birthweight/age-specific (neonatal and postneonatal) mortality rates of White, Black, and all infants were examined by 500-g groups, from less than 500 g to 5000 g or more.

Percentage declines in birthweight groups and mortality rates and Taylor series

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