

# Comparability of Infant Death and Birth Certificates and Their Influence on Infant Mortality

*A study in Minnesota, 1967-71*

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INFANT MORTALITY RATES provide one of our more reliable measures of health for a group or a region. The rates usually are calculated from births and infant deaths occurring during the first year of life for a period of 1 or more calendar years. A major defect of this technique is that even when there is complete registration, some of the infants who die were born during the previous year and some born during the period under study died during the following year; thus, we obtain a ratio of deaths to births rather than a rate that may differ significantly for a small group or region. Another defect in this technique is that it does not allow evaluation of information recorded on the birth certificate, such as birth weight, mother's age, prenatal care, order of birth, and

complications or conditions associated with pregnancy and delivery.

The alternate to the usual technique is to match all infant death certificates with their corresponding birth supplements and to use the resident births occurring during a definite period of time as the base. Both techniques presuppose that transcripts are available for all resident births and deaths occurring out of State, as well as transcripts of all infant death certificates issued out of State that indicate the births occurred in the State.

In this study, we included all infant death certificates filed in Minnesota and the transcripts of infant death certificates filed in other States or Canada which were sent to us because the infants had lived or were born in Minnesota. All infant death certificates for 1967-71 were matched with their corresponding birth certificates; infants born in 1966 or 1971 were excluded.

The matching or linkage was started to enable us to analyze such

information as birth weight, gestation, and conditions of the mother and infant that was reported on the birth supplement, as well as factors reported on the death certificates that relate to infant mortality. We are now in the process of making this analysis.

As a result of the matching procedure, we also have a comparison of the conventional and cohort infant mortality rates and a measure of the comparability of the data reported on both certificates. In addition to the inconsistency of data reported on the matching certificates, there are errors in the coding or keypunching of data. The coding errors are not discussed here; however, they have been corrected and have provided us with a reliability measurement.

The data common to birth and death certificates are date of birth, residence, race, and sex. Inconsistencies in date of birth and sex are rare and usually can be corrected by assuming that the birth certificate and hospital records are correct. The most common error is the calculation of age.

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**Table 1. Comparability of residence recorded on matched birth-infant death certificates, Minnesota resident birth cohort, 1967-70**

Age at death	Residence on death certificate		
	Agrees with birth certificate	Differs from birth certificate	
		Number	Number
<b>Total live birth cohort:</b>			
Neonatal	3,569	93	2.5
Less than 1 day	2,120	53	2.4
1-6 days	1,129	27	2.3
7-27 days	320	13	3.9
Postneonatal	975	95	8.9
Less than 1 year	4,544	188	4.0
<b>Single live birth cohort:</b>			
Neonatal	3,144	83	2.6
Less than 1 day	1,818	45	2.4
1-6 days	1,028	25	2.4
7-27 days	298	13	4.2
Postneonatal	938	92	8.9
Less than 1 year	4,082	175	4.1

**Table 2. Comparability of race recorded on matched infant birth and death records, Minnesota resident birth cohort, 1967-70**

Race coded on birth certificate	Race coded on infant death certificate				
	White	Negro	Indian	Other	Total
<b>Total:</b>					
White	4,504				4,504
Negro	5	110	2		117
Indian	28		69		97
Other	3			11	14
<i>Age at death</i>					
<b>Less than 1 day:</b>					
White	2,091				2,091
Negro	3	39	1		43
Indian	8		24		32
Other	2			5	7
<b>1-6 days:</b>					
White	1,117			1,117	
Negro	1	20	1		22
Indian	1	+	11		12
Other	1			4	5
<b>7-27 days:</b>					
White	313				313
Negro		9			9
Indian	5		4		9
Other				2	2
<b>Postneonatal:</b>					
White	983				983
Negro	1	42			43
Indian	14		30		44
Other					

<sup>1</sup>Includes 2 of unknown race.  
<sup>2</sup>Includes 1 of unknown race.

### Comparability of Data

A comparison of residence data is shown in table 1. We expected some differences because of family moves during the postneonatal period, but the 2.4 percent and 2.3 percent differences in less than 7 days can be interpreted as errors. Also, the differences are not affected by the inclusion of multiple births with the total birth sample, as comparison with the single birth sample shows (table 1). Information obtained during the hospital stay is probably more accurate than that obtained at a mortuary; we assume the birth certificate is correct. (When differences occurred, the information obtained from and approved by the mother during the hospital stay was accepted as more reliable than the information on the death certificate collected during a traumatic period and possibly obtained from persons other than the parents of the child.)

Comparability of race data is shown in table 2. All infants reported as white on birth certificates were reported as white on death certificates, regardless of age at death. Of the infants grouped by age at death and reported as white on death certificates, 0.3 to 1.6 percent were reported as nonwhite on birth certificates. All infants reported as Negro on their death certificates were reported as Negro on birth certificates; however, up to 9.3 percent of the infants reported as Negro on birth certificates were reported as non-Negro on death certificates. The reporting of race varied most for Indian infants. Of the infants reported as Indian on death certificates, up to 8.3 percent were reported as non-Indian on their birth certificates, whereas 8.3 to 55.6 percent of the infants reported as Indian on birth certificates were reported as non-Indian on death certificates. A similar study on race differentials was reported by Norris and Shipley (1).

### Conventional and Cohort Rates

Conventional infant mortality rates, before and after corrections that were discovered during the

**Table 3. Conventional and cohort infant mortality rates, by age at death and race, Minnesota resident births, 1968-70<sup>1</sup>**

Age at death and type of rate	Mortality rates by race			
	Total	White	Negro	Indian
<b>Infant:</b>				
Conventional, before .....	17.6	17.5	31.2	21.0
Conventional, after .....	17.6	17.5	30.4	21.8
Cohort .....	17.3	17.1	31.5	<sup>2</sup> 30.5
<b>Neonatal:</b>				
Conventional, before .....	13.6	13.6	18.7	12.8
Conventional, after .....	13.6	13.6	18.0	13.2
Cohort .....	13.5	13.5	19.8	17.7
<b>Less than 1 day:</b>				
Conventional, before .....	7.9	8.0	10.7	7.0
Conventional, after .....	7.9	8.0	9.9	7.8
Cohort .....	7.9	7.9	10.6	10.3
<b>1-6 days:</b>				
Conventional, before .....	4.3	4.4	5.1	4.9
Conventional, after .....	4.3	4.4	5.1	4.1
Cohort .....	4.3	4.3	5.9	4.1
<b>7-27 days:</b>				
Conventional, before .....	1.3	1.3	2.9	.8
Conventional, after .....	1.3	1.3	2.9	1.2
Cohort .....	1.3	1.3	3.3	<sup>2</sup> 3.3
<b>Postneonatal:</b>				
Conventional, before .....	4.0	3.8	12.5	8.2
Conventional, after .....	4.0	3.8	12.5	8.6
Cohort .....	3.8	3.6	11.7	<sup>2</sup> 12.8

<sup>1</sup>Conventional rates before and after corrections discovered during the matching process were made. The cohort rates were determined by race as stated on the birth certificate.

<sup>2</sup>Significantly different from the corrected conventional rate at the 5 percent level.

matching process, and cohort infant mortality rates are given in table 3, by race and age at death.

The conventional mortality rates are determined as the ratio of the number of infant deaths (as recorded on the death certificate) per 1,000 births (as recorded on the birth certificate), by race for the period 1968-70. The only differences in the before and after correction rates are for Negroes and Indians, and these differences were due to the small number of births for these two groups.

The cohort mortality rates are determined from the number of infants born in 1968-70 that died during the first year of life per 1,000 births, by race as recorded on the birth certificate. Although differences exist between the conventional (after corrections) and

cohort infant mortality rates, the only rates that are significantly different by race are those for the Indian infants who died after the first week of life.

### Conclusions

In this study of the comparability of Minnesota infant death and birth certificates, we included all infant death certificates from 1967-71 that were filed in Minnesota and the transcripts of infant death certificates filed in other States or Canada that were sent to us because the infants were residents of or were born in Minnesota.

There was a difference in the residence reported on the birth and death certificates for 2.4 percent of the infants dying during the first day and for 2.3 percent of the infants dying during the 1-6-day

period. Infants reported as white on their birth certificates were also reported as white on their death certificates. However, 6.0 percent of the infants reported as Negro on their birth certificates were reported as non-Negro on their death certificates, and 28.9 percent of the infants reported as Indian on their birth certificates were reported as non-Indian on their death certificates.

The cohort and conventional infant mortality rates for Indians who died after the first week of life are significantly different.

### Reference

- Norris, F. D., and Shipley, P. W.: A closer look at race differentials in California's infant mortality, 1965-1967. HSMHA Health Rep 86: 810-814, September 1971.