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## **Congruence Between Race and Ethnicity Reported on Infant Death Certificates and the Matching Live Birth Certificates: North Carolina, 2002–2006**

by

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### **Abstract**

This report compares race and ethnicity of the mother reported on the live birth certificates with race and ethnicity of the decedent reported on the matching infant death certificates. Infant mortality rates are calculated using mother's race and ethnicity from the birth certificate and compared to infant mortality rates calculated using race and ethnicity from the infant death certificate. The infant death rates for Hispanics and Asians are one-fifth and one-fourth larger, respectively, when using the mother's race/ethnicity from the matching birth certificate rather than the infant's race/ethnicity from the death certificate. Tabulations of infant death rates by race and ethnicity (especially for smaller racial/ethnic groups) should use the mother's race and ethnicity from the matching birth certificate for the numerator, which are likely to be more accurate since they are self-reported.



North Carolina Department of Health and Human Services

## Introduction

North Carolina has not yet adopted the new national model certificate of live birth. We are still using the birth certificate and death certificate that were adopted in the late 1980s. Both of these certificates collect data on race via open-ended, fill-in-the-blank boxes. The birth certificate collects data on “Color or Race of Father” and “Color or Race of Mother,” usually from information provided by the mother on a worksheet in the hospital before delivery. The death certificate collects data on the race of the decedent, usually filled in by a funeral director, ideally after consultation with the family of the decedent.

The many open-ended responses to race are coded by Vital Records staff into 10 standard racial categories according to rules provided by the National Center for Health Statistics (NCHS). The 10 standard, fixed racial categories are: white, black, American Indian, Chinese, Japanese, Hawaiian, Filipino, Other Asian or Pacific Islander, other race, and unknown race. Out of nearly 118,000 live births in North Carolina in 2002, mothers wrote in more than 600 different versions of race on birth certificates,<sup>1</sup> which were collapsed into the 10 categories. Birth certificate data are tabulated for statistical reporting by the race of the mother using the 10 standard racial categories, in keeping with the recommendation of the NCHS. In North Carolina, approximately 16 percent of live birth records are missing information on the father’s race. This is because if the mother is unmarried and no paternity affidavit has been established, then the father’s name and demographic information cannot be included on the birth certificate. Prior to about 1990, the race of both the mother and father were considered in a complex NCHS algorithm to determine the race of the child, which was usually considered to be the darker of the races of the mother and father.

On the death certificate, ethnicity is captured by a yes/no answer to the question “Was Decedent

of Hispanic Origin?” On the birth certificate, there is a yes/no response to the question of Hispanic origin for both the mother and father, which is reported by the mother while in the hospital for delivery. The birth data are usually tabulated by the Hispanic ethnicity of the mother. Approximately two-thirds of mothers of Hispanic ethnicity report their race on the birth certificate with a label that can be categorized as “other race” (often “Hispanic” is written as the race), but nearly all of these births are re-coded to “white” according to NCHS coding rules.<sup>1</sup>

As in other states, each year North Carolina matches infant death certificates to the corresponding live birth certificates. We normally are able to successfully match 98 percent of the infant death certificates to a birth certificate. As a result of this matching process, we can jointly analyze the variables on the birth and death certificates. Prior to 1998, North Carolina created the matched birth/infant death files according to year of birth. In 1998 and later years, this matched file is oriented to the year of infant death. This is in keeping with the current practice of the NCHS, and allows completion of the matched file much earlier than before.<sup>2</sup>

This report compares race and ethnicity of the mother reported on the live birth certificates with race and ethnicity of the decedent reported on the matching infant death certificates. Infant mortality rates are calculated using mother’s race and ethnicity from the birth certificate and compared to infant mortality rates calculated using race and ethnicity from the infant death certificate. This report also compares the race/ethnicity of mother and race/ethnicity of father as reported on the live birth certificates.

## Results

Table 1 shows data for 2002–2006 North Carolina infant deaths, tabulated by race/ethnicity as recorded on the death certificate compared to race/ethnicity of mother as self-reported on the birth certificate. Only North Carolina residents

**Table 1. North Carolina Resident Infant Deaths, 2002–2006:  
Race/Ethnicity of Mother on Birth Certificate  
by Race/Ethnicity on Death Certificate\***

RACE OF INFANT ON DEATH CERTIFICATE												
	Other NonWhite	White	Black	American Indian	Chinese	Japanese	Hawaiian	Filipino	Other Asian	Unknown Race	Hispanic, Any Race	Total
RACE OF MOTHER ON BIRTH CERTIFICATE												
Other NonWhite	0	1	6	0	0	0	0	0	0	0	0	7
White	5	2,019	70	8	0	0	0	0	3	4	44	2,153
Black	0	38	2,083	3	0	0	0	1	3	2	11	2,141
American Indian	0	10	3	66	0	0	0	0	0	0	6	85
Chinese	0	0	0	0	4	0	0	0	0	0	0	4
Japanese	1	1	0	0	0	0	0	0	1	0	0	3
Hawaiian	0	0	0	0	0	0	0	0	1	0	0	1
Filipino	0	1	0	0	0	0	0	0	0	0	0	1
Other Asian	0	13	3	2	3	1	0	0	50	0	1	73
Hispanic, Any Race	2	124	22	1	0	0	0	0	0	2	405	556
TOTAL	8	2,207	2,187	80	7	1	0	1	58	8	467	5,024

\* Race categories do not include Hispanic.  
Source: Data from the Matched Birth/Infant Death files

are included, defined by the residence on the matching birth certificate. The racial categories do not include Hispanics, who are reported in a separate ethnicity category. There were 5,024 infant deaths during this time period, and for 4,627 (92%) of these infant deaths the detailed race/ethnicity category was the same on both the infant death and the live birth certificate.

Race-specific infant death rates (infant deaths per 1,000 live births) are often published by states using race as recorded on the death certificate to specify the numerator. Table 2 shows differences in 2002–2006 North Carolina infant death rates when race/ethnicity from the death certificate is used versus when mother’s race/ethnicity from the matching birth certificate is used. Mother’s race/ethnicity from the birth certificate is presumably

more accurate because it is self-reported. Due to the small numbers of infant deaths in some of the racial categories, the data for Chinese, Japanese, Hawaiian, Filipino, and Other Asian are combined into one “Asian” category in Table 2. Live births tabulated by the mother’s race/ethnicity are used as the denominator of the rates in both columns.

Table 2 shows that infant death rates are lower for whites and blacks when using mother’s race/ethnicity from the matching birth certificate, and they are higher for American Indians, Asians, and Hispanics. This suggests that there is a net misclassification of American Indians, Asians, and Hispanics as white or black on the infant death certificates. The infant death rates for Hispanics and Asians are one-fifth and one-fourth

**Table 2. 2002–2006 North Carolina Infant Death Rates Calculated Using Infant’s Race/Ethnicity from the Death Certificate and Mother’s Race/Ethnicity from the Matching Live Birth Certificate**

	Infant’s Race/Ethnicity	Mother’s Race/Ethnicity	Percent Difference
White, non-Hispanic	6.3	6.1	-3.2%
Black, non-Hispanic	15.7	15.3	-2.5%
American Indian, non-Hispanic	9.8	10.4	6.1%
Asian, non-Hispanic	4.1	5.1	24.4%
Hispanic	5.2	6.2	19.2%

larger, respectively, when using the mother’s race/ethnicity from the matching birth certificate rather than the infant’s race/ethnicity from the death certificate.

Data not shown in the tables here indicate that 97 percent of the 556 Hispanic infant deaths (using ethnicity from the matching birth certificate) were classified as white on the live birth data files (as a result of the NCHS re-coding rules). Since the infant death rates for white, non-Hispanics and Hispanics are very similar (6.1 versus 6.2), the total white infant death rate (including Hispanics) is about the same as the white, non-Hispanic infant death rate. However, for other measures there are larger differences. For example, the percentage of live births where the mother smoked during pregnancy was 15.9 for white, non-Hispanics compared to 1.3 for Hispanics. Given that 15 percent of North Carolina resident live births during 2002–2006 were to Hispanic women, including nearly all (98%) of these Hispanic births in the white racial category results in a percentage of total white women who smoked during pregnancy of 13.0 percent.

It might be argued that the race and ethnicity of the infant could be different from the race/ethnicity of the mother when taking into consideration the race/ethnicity of the father. In North Carolina

during 2002–2006, 16 percent of the live birth certificates had unknown race/ethnicity for the father. Among the remaining 84 percent of the birth records where both mother’s and father’s race/ethnicity was reported (by the mother), the detailed race/ethnicity category was in agreement for the father and mother 91 percent of the time (see Table 3). The biggest numerical differences were where the mother was classified as Hispanic, Other Asian, American Indian, or black and the father was classified as white, non-Hispanic; the mother was classified as Hispanic and the father was classified as black; the mother was classified as black and the father was classified as Hispanic; and the mother was classified as white, non-Hispanic and the father was classified as black, Hispanic, American Indian, or Other Asian. It is not clear how the father’s race would be used to more accurately categorize the race of the infant. More than 15 years ago, the NCHS abandoned the approach of imputing the race of the infant from the races of the mother and father. The current federal standard is to consider the race of the infant to be the same as the race of the mother.

**Conclusion**

“Race” is perceived in different ways by different people. Race as collected on vital records is imprecise and subject to the vagaries of reporting

**Table 3. North Carolina Resident Live Births, 2002–2006:  
Race/Ethnicity of Mother by Race/Ethnicity of Father\***

RACE OF FATHER												
	Other NonWhite	White	Black	American Indian	Chinese	Japanese	Hawaiian	Filipino	Other Asian	Unknown Race	Hispanic, Any Race	Total
RACE OF MOTHER												
Other NonWhite	62	120	139	4	0	0	0	1	11	140	27	504
White	105	295,652	10,777	2,069	74	49	43	201	1,628	31,761	10,218	352,577
Black	48	2,561	83,208	301	4	2	4	15	152	51,646	1,568	139,509
American Indian	2	1,381	751	3,304	0	0	1	3	29	2,353	329	8,153
Chinese	1	97	3	0	571	3	0	1	14	22	5	717
Japanese	1	120	28	2	0	59	0	2	3	5	12	232
Hawaiian	0	29	15	0	0	0	6	1	1	15	11	78
Filipino	0	387	101	4	2	0	1	197	16	42	41	791
Other Asian	8	2,569	540	42	18	3	6	16	10,307	602	241	14,352
Hispanic, Any Race	31	5,783	2,166	166	4	2	11	19	142	12,359	68,462	89,145
TOTAL	258	308,699	97,728	5,892	673	118	72	456	12,303	98,945	80,914	606,058

\* Race categories do not include Hispanic.  
Source: Data from the Live Birth Certificate files

by many people. Racial categories may be useful as surrogate measures for broad socioeconomic and cultural differences. Often, racial categories need to be combined to achieve statistical precision in race-specific analyses. Tabulations of infant death rates by race and ethnicity (especially for smaller racial/ethnic groups) should use the mother's race and ethnicity from the matching birth certificate for the numerator, which are likely to be more accurate since they are self-reported.

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