Assessing the impact of using maternal race in vital records to measure racial and ethnic disparities in birth outcomes and maternal risk factors in Michigan

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Introduction
The Michigan Department of Community Health is currently implementing the PRIME Project to understand and reduce disparities in African American and American Indian infant mortality in Michigan. Birth records are a key source of data for understanding risk factors for infant mortality. How race is classified in the birth records may change estimates of risk factors for African Americans and American Indians. Classification of race in birth records is sociologically and statistically significant. Race is a social construct, defined and classified by society. How race is classified in birth records has changed over time. Current National Center for Health Statistics practice is to use the race of the mother alone and not assign the infant its own race. This ignores the impact a father’s race has on the infant’s utero experiences and health outcomes (Figure 1). Infants are assigned their own race on death certificates, which may not match the mother’s race on the birth certificate.

It is not known to what extent including the father’s race would change estimates of infant health outcomes or associated disparities.

Figure 1: Examples of how a parent’s race/ethnicity was determined.

Methods
Hypotheses
For each outcome of interest, two hypotheses were tested:

Hypothesis one: prevalence using mother’s race alone is the same as the prevalence using mother and/or father’s race.

Hypothesis two: using mother’s race alone will not identify different disparities than using mother and/or father’s race.

Methods
Hypotheses were tested by comparing 95% confidence intervals. Prevalences were calculated using SAS v.9.2 and confidence intervals were calculated and compared by hand. Because the two methods of classifying race/ethnicity resulted in populations that were not independent, further statistical analyses to compare differences between the two populations were not possible.

Results

In all cases, using the mother and/or father to classify race resulted in a larger sample size than using the mother’s race alone (Table 1).

- Smallest two populations increased the most (American Indian, NH and Multiracial/Other, NH).
- Decreased number of cases missing race/ethnicity for both mother and father.

For all outcomes except preterm birth, estimates using mother and/or father were not independent, limiting statistical comparisons.

Racism and segregation in the birth records may change estimates of risk factors. Both methods are externally imposed assignments of race/ethnicity and may differ from how the parents identify the infant’s race/ethnicity.

Because the two methods of classifying race/ethnicity resulted in populations that were not independent, further statistical analyses to compare differences between the two populations were not possible.

Table 1. Effect of different race/ethnicity classification methods on sample sizes, by race/ethnicity

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Mom Alone</th>
<th>Mom and/or Dad</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>African, NH</td>
<td>343265</td>
<td>34190</td>
<td>1.1%</td>
</tr>
<tr>
<td>American, NH</td>
<td>326558</td>
<td>34952</td>
<td>7.2%</td>
</tr>
<tr>
<td>Arab, NH</td>
<td>5663</td>
<td>962</td>
<td>71.1%</td>
</tr>
<tr>
<td>Asian, NH</td>
<td>18958</td>
<td>17561</td>
<td>7.5%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>51849</td>
<td>50621</td>
<td>2.5%</td>
</tr>
<tr>
<td>Multiracial/Other, NH</td>
<td>6905</td>
<td>19158</td>
<td>175.5%</td>
</tr>
<tr>
<td>White, NH</td>
<td>328058</td>
<td>343805</td>
<td>5.1%</td>
</tr>
<tr>
<td>Missing</td>
<td>2932</td>
<td>2749</td>
<td>-6.0%</td>
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</tbody>
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Discussion
Using the mother and/or father’s race results in larger sample sizes, a smaller proportion of infants missing race/ethnicity, and smaller confidence intervals for some indicators in some populations. Using the mother alone to approximate the race/ethnicity of her infant results in estimates of health outcomes that in some cases are statistically different from estimates that use the mother and/or father to approximate race.

In the six outcomes investigated in this study, the effect size was small and did not result in different identifications of disparities.

Future studies should assess how different classifications of race/ethnicity affect the strength of associations between risk factors and infant health outcomes.

Limitations:
- As with all studies using birth record data, this study is subject to misclassification of race and measurement error of health outcomes.
- The two populations being compared (mom’s race alone vs. mother and/or father’s race) are not independent, limiting statistical comparisons.
- A high percentage of mothers are missing race/ethnicity (70.03%, compared to 0.60% for mothers).
- The classification of infants using mother and/or father’s race puts some infants in two categories.

Recommendations:
- The best way to assess an infant’s race is to add a field on the birth certificate for infant’s race and ask the parents to identify the infant’s race at birth.
- Studies using race/ethnicity data currently available from the birth records should address the impact of excluding the father’s race/ethnicity when measuring racial/ethnic disparities in infant health.

Classification of race in this study
To assess the impact of including the father’s race when estimating health outcomes in the birth records.

1. To assess the impact of including the father’s race when measuring disparities in the birth records. Disparity defined as a statistically significant difference between estimate and the reference group.

2. To assess the impact of including the father’s race when estimating health outcomes in the birth records. Disparity defined as a statistically significant difference between estimate and the reference group.

Methods

Seven new variables created, each dichotomized as yes/no:
- Mother and/or father is African American, Non-Hispanic
- Mother and/or father is American Indian, Non-Hispanic
- Mother and/or father is Arab, Non-Hispanic
- Mother and/or father is Asian American, Non-Hispanic
- Mother and/or father is Hispanic/Latino
- Mother and/or father is Multiracial/Other, Non-Hispanic
- Mother and/or father is White, Non-Hispanic

Six outcomes of interest:
- Tobacco use during pregnancy
- Low birth weight (<2500 grams)
- Preterm birth (<37 weeks)
- Mother’s education <12 years
- Inadequate prenatal care (Kotelchuck=adequate)
- Medicaid used to pay for delivery

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References

Acknowledgments
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