

# **Validity of Medicaid Enrollment at Delivery and WIC Prenatal Participation on the Revised Florida Birth Certificate and the Pregnancy Risk Assessment Monitoring System, 2004-2005**

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## **Introduction**

Birth certificate data continues to be an important source of information on pregnant women and infants for state and local public health practitioners, policy makers, researchers, and the public to monitor health status, investigate diseases and conditions, and evaluate health policies, programs and services.

The Pregnancy Risk Assessment Monitoring System (PRAMS) is another information source used to monitor the health of mothers and infants. The PRAMS is an ongoing population-based surveillance system and its purpose is to monitor selected maternal behaviors and experiences that occur before, during, and after pregnancy among women who deliver live-born infants. Self-reported survey data are linked to selected birth certificate data and weighted for sample design to create annual PRAMS analysis data sets. This data set is an important tool for planning and evaluating prenatal health programs (1). The PRAMS survey includes questions on insurance before pregnancy, during pregnancy and at delivery and WIC prenatal participation.

The Special Supplemental Nutrition Program for WIC (WIC) has been an important source of nutrition education, supplemental food, and health care referrals for low-income women during and after pregnancy and for infants and children up to age 5 whose family income is at or below established income eligibility standards and who are found to be at nutritional risk (2).

Florida Medicaid is a state and federal partnership that provides health insurance coverage for selected categories of people with low incomes. Its purpose is to improve the health of people who might otherwise go without medical care for themselves and their children (3).

With the increased accessibility and use of these public health data sets through Florida CHARTS and other mechanisms, the need to understand accuracy and completeness is increasingly important. Most users assume that the public health data provided by the Department of Health are accurate and useful. During 2004, Florida implemented a revised birth certificate which included two new data elements: Medicaid enrollment at delivery and WIC prenatal participation.

## **Study Objective**

The objective of this study was to assess the validity of Medicaid enrollment at delivery and WIC prenatal participation as reported on the revised birth certificate.

## **Methods**

Annually the University of Florida (UF) links Medicaid enrollment files to birth certificates using deterministic linking methods. These links are shared with the Department of Health (DOH) as a Medicaid flag (to indicate a Medicaid recipient). This Medicaid flag is used for public health

purposes. To validate the new elements on the birth certificate for calendar years 2004 and 2005, the PRAMS files were linked to the birth certificate files, which included the Medicaid flag (n=3,404) provided by UF. This file is substantially smaller than all births because the PRAMS data set is a small representative sample of all births. WIC prenatal participation files (n=2,728) were also linked using deterministic and probabilistic linking methods. The linkage rates were > 95%. This study was limited to singleton live births and PRAMS respondents with known responses, which yielded 5,296 un-weighted records.

In this study, the program files for Medicaid enrollment at delivery and WIC prenatal participation were used as the “gold standards”; these data sets were assumed to be correct in terms of Medicaid and WIC participation. Using this information, sensitivity, specificity, positive predictive value and negative predictive values were estimated for both data elements on the PRAMS and the revised birth certificate. These terms are defined below:

- Sensitivity is the percentage of all women in WIC or on Medicaid that were identified to be in either program by the PRAMS or the birth certificate,
- Specificity is the percentage of all women not in WIC or not on Medicaid that were identified not to be in either program by the PRAMS or the birth certificate,
- Positive predictive value is the percentage of all women identified by the PRAMS or the birth certificate to be in either program who are actually in either program, and
- Negative predictive value is the percentage of all women identified by the PRAMS or the birth certificate not to be in either program who are actually not in either program.

The questions examined from the revised birth certificate are listed below:

- Principal source of payment for this delivery?
  - Responses: Medicaid, Private Insurance, Self Pay, or Other (specify)
- Did mother get WIC food for herself during this pregnancy?
  - Responses: Yes or No

The questions examined from the PRAMS are listed below:

- How was your delivery paid for?
  - Responses: Medicaid, Personal income, Health insurance or HMO, Medipass, Healthy Start, Other
- During your most recent pregnancy, were you on WIC?
  - Responses: Yes or No

With Internal Review Board (IRB) approval for linkages, Microsoft Standard Query Language (SQL) 2005 and Statistical Programming Software for the Social Sciences (SPSS) for Windows 16.0 were used to link the DOH datasets. To be representative of all women who gave birth in Florida the PRAMS results were weighted using SPSS Complex Samples.

## Results

Table 1 shows the weighted counts and percentages of singleton live births on Medicaid and/or WIC.

	<b>Number</b>	<b>Percent</b>
Total Singleton Live Births	425,582	
On Medicaid	236,742	56%
On WIC	199,302	47%

\* This table reflects weighted data. Given that some of the women on Medicaid are also on WIC the percentages will not add up to 100%.

Table 2 shows the validity measures for Medicaid enrollment at delivery varied between the birth certificate and the PRAMS. For the birth certificate, the sensitivity was relatively fair at 78% (95% CI: 75%, 80%) and the specificity was high at 96% (95% CI: 95%, 98%). This means the birth certificate only identified 78% of all the women whose delivery was paid for by Medicaid and almost identified all of the women whose delivery was not paid for by Medicaid. In addition, the positive predictive value was 97% (95% CI: 95%, 98%) and the negative predictive value was 78% (95% CI: 75%, 80%). This means the birth certificate was correct 97% of the time when identifying a delivery paid for by Medicaid, but the birth certificate data was correct only 78% of the time when identifying a delivery was not paid for by Medicaid. In terms of the latter, the birth certificate was incorrect about one out of four times, which suggests this data is substantially biased.

<b>Medicaid Enrollment at Delivery</b>	<b>Medicaid vs. Birth Certificate, % (95% CI)</b>	<b>Medicaid vs. PRAMS, % (95% CI)</b>
Sensitivity %	78% (75%, 80%)	87% (85%, 89%)
Specificity %	96% (95%, 98%)	97% (95%, 98%)
Positive Predictive Value	97% (95%, 98%)	97% (96%, 98%)
Negative Predictive Value	78% (75%, 80%)	85% (83%, 87%)
<b>WIC Prenatal Participation</b>	<b>WIC vs. Birth Certificate, % (95% CI)</b>	<b>WIC vs. PRAMS, % (95% CI)</b>
Sensitivity %	87% (85%, 89%)	92% (90%, 94%)
Specificity %	92% (90%, 93%)	90% (88%, 92%)
Positive Predictive Value	90% (88%, 92%)	89% (87%, 91%)
Negative Predictive Value	89% (87%, 97%)	93% (91%, 94%)

For the PRAMS, the sensitivity for Medicaid enrollment at delivery was relatively high at 87% (95% CI: 85%, 89%) with a high specificity of 97% (95% CI: 95%, 98%). This means that the PRAMS identified 87% of the women whose delivery was paid by Medicaid and identified 97% of the women who were not on Medicaid. Additionally, the positive predictive value was 97% (95% CI: 96%, 98%) and the negative predictive value was 85% (95% CI: 83%, 87%), which means the PRAMS data was correct almost all of the time when it reported a woman's delivery was paid by Medicaid and the PRAMS was correct 85% of the time when it reported the delivery was not paid for by Medicaid.

The validity measures for WIC prenatal participation also varied by data source in a fashion similar to the PRAMS, as shown in Table 2. For birth certificates, the sensitivity for WIC participation was good, 87% (95% CI: 85%, 89%), while the specificity was high, 92% (95% CI: 90%, 94%). Thus the birth certificate identified 87% of the WIC prenatal participants and identified 92% of those women who were not WIC prenatal participants. The positive predictive value was 90% (95% CI: 88%, 92%) and the negative predictive value was 89% (95% CI: 87%, 91%), which indicates the birth certificate was correct 90% of the time when identifying a women as a WIC prenatal participant and was correct 89% of the time when identifying a women who was not a WIC prenatal participant.

For the PRAMS, the sensitivity for WIC prenatal participation was relatively high at 92% (95% CI: 90%, 94%) with a high specificity of 90% (95% CI: 88%, 92%). This means the PRAMS identified 92% of the WIC prenatal participants and identified 90% of those women who were not WIC prenatal participants. The positive predictive value was 89% (95% CI: 87%, 91%) and the negative predictive value was 93% (95% CI: 91%, 94%), therefore the PRAMS was correct 89% of the time when identifying a women as a WIC prenatal participant and was correct 93% of the time when identifying a woman who was not a WIC prenatal participant.

## **Conclusion**

This study found that when compared to PRAMS the birth certificate underreports Medicaid payment for delivery. Both PRAMS and birth certificate reporting of WIC prenatal participation are good. When utilizing these and other birth certificate data elements for decision making purposes, researchers, policy makers, and state and local health practitioners should be aware of the accuracy of the data sources.

A major strength of this study was the ability to use actual Medicaid enrollment data and WIC prenatal participation data as “gold standards”. Several limitations are inherent when using birth certificate data. The one that impacts this study most is ascertainment, was the information taken from the patient record or self reported? In regards to Medicaid at delivery, was the information known at the time of delivery? Limitations of the PRAMS data are 1) all data are self-reported and 2) maternal recall bias may occur. Though our linkage rate was above 95%, the results presented are only as good as the linkages and as a result limitations may exist in the linking methods.

The accuracy of the birth certificate data may be improved by improving the training of hospital clerks and birth registration personnel who complete the certificate and by assuring that the wording of birth certificate questions and instructions are understandable by those who report. Additionally, the accuracy of these data elements could be assessed by hospital staff and potentially used to focus quality improvement efforts.

It is recommended that the Department of Health should provide statements of data accuracy on all released data reports that indicate the accuracy of variables provided. For example, reports pertaining to Medicaid payment for delivery can have a statement that reads: “The indication of a delivery paid by Medicaid was found to have a sensitivity of 78% and a specificity of 96%, which means this indicator correctly identifies 78% of the women whose delivery was paid for by Medicaid and nearly always correctly identifies all of the women whose delivery was not paid for by Medicaid”.

References:

- (1) Centers for Disease Control and Prevention. Pregnancy Risk Monitoring System (PRAMS). <http://www.cdc.gov/prams/>.
- (2) Oliveira, V., Racine, E., Olmsted, J., Ghelfi, L.M. The WIC Program: Background, Trends, and Issues, Food Assistance and Nutrition Research Report No. (FANRR27), October 2002 <http://www.ers.usda.gov/publications/fanrr27/fanrr27e.pdf>.
- (3) Florida Agency for Health Care Administration, <http://www.fdhc.state.fl.us/medicaid/flmedicaid.shtml>, Date accessed: July 29, 2009.