

# MI PRAMS DELIVERY



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## Points of Interest

- Folic acid supplementation has been shown to reduce birth defects by up to 70%
- While folic acid is known to be an effective public health intervention, the March of Dimes Gallup poll found that only 12% of women who were aware of folic acid knew it should be taken before pregnancy
- While awareness of the benefits of folic acid among women with an intended pregnancy or a college education exceeded 80%, less than half reported consuming a daily multivitamin or prenatal vitamin
- Healthy People 2010 aims to have 80% of nonpregnant women age 15-44 consuming the recommended 400 ug of folic acid daily

## MATERNAL FOLIC ACID AWARENESS AND VITAMIN USE AMONG MICHIGAN MOTHERS, 2004-2006

Folic Acid supplementation is one of the most successful birth defect prevention interventions ever known. Folic acid, a B-vitamin, has been shown to prevent NTDs, most commonly spina bifida and anencephaly which almost universally result in catastrophic disability or death.

In 1992, the U.S. Public Health Service recommended that all women of reproductive age consume 400 micrograms of folic acid daily<sup>1</sup>. In 1998, fortification of enriched cereal-grain products became mandatory in the United States<sup>2</sup>.

The March of Dimes commissioned the Gallup Organization beginning in 1995 to conduct surveys measuring women's

awareness and behavior related to folic acid. While in 2007 81% of U.S. women 18-45 years old reported hearing/reading something about folic acid, only 12% knew that it should be taken before pregnancy to reduce the risk of birth defects<sup>3</sup>. The women least likely to consume a daily vitamin with folic acid were 18-24 years old (30%), non-white (36%), had less than a high school education (29%) and reported their annual household income to be less than \$25,000 per year (32%).

Beginning in 2004, the Michigan Pregnancy Risk Assessment Monitoring System (PRAMS) survey asked women a slightly modified question regarding multivitamin use. The question asked, "During the month before you got pregnant with



*your new baby, how many times a week did you take a multivitamin or a prenatal vitamin?"* The survey also asked a new question about folic acid awareness. The question asked, "Before you got pregnant with your new baby, did either of the following things happen?"

*A. You heard or read that taking the vitamin folic acid or foods that contain it (orange*

## About Neural Tube Defects

● **Spina Bifida**—Spina bifida occurs when the bones of the spine do not form normally. It can vary in severity, with the most severe type resulting in the spinal cord protruding out of the baby's back.<sup>4</sup>

● **Anencephalus**—Anencephalus occurs when the neural tube fails to close properly at the head, resulting in a large portion of the brain and skull missing. This defect is universally fatal.<sup>5</sup>

● **Other NTDs**—While quite rare, other NTDs including encephaloceles and iniencephaly do occur. Encephaloceles is diagnosed when parts of the brain and its membranes bulge out through openings in the skull. Iniencephaly occurs when the head is bent back at a severe angle and the baby usually does not have a neck.<sup>5</sup>



(cont. from page 1) juice, citrus fruits, broccoli, green leafy vegetables, and fortified cereal) could help prevent some birth defects.

B. Your doctor or nurse instructed you on how to get enough folic acid.”

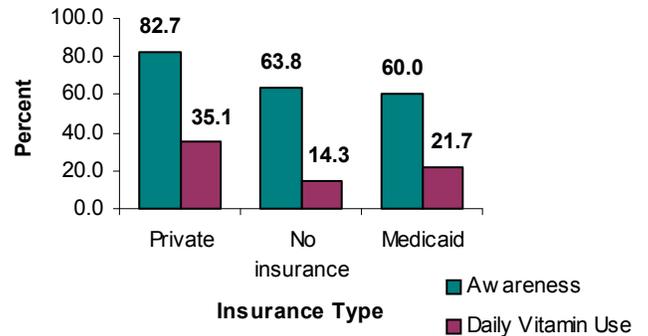
## DEMOGRAPHICS

Analysis of Michigan PRAMS data indicate that Non-Hispanic black women, mothers aged less than 20, unmarried mothers, those without private health insurance, and those reporting an unintended pregnancy were least likely to be aware that folic acid may help prevent birth defects. Similarly, these women also reported that their doctor or nurse failed to instruct them on how to get enough folic acid.

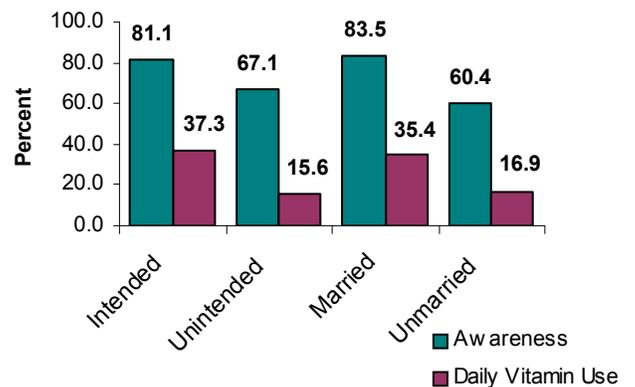
While the proportion of several characteristics regarding folic acid awareness exceeded 80% (Figures 2-4), the prevalence of the corresponding daily multivitamin/prenatal vitamin use were dismal. Particularly, among women who had an intended pregnancy, less than half of the women who were aware of the benefits of folic acid consumed a daily multivitamin/prenatal vitamin. Maternal education was associated with both folic acid awareness and daily consumption. As education increased, both awareness and daily vitamin consumption increased. Although, even among the most highly educated women where awareness exceeded 90%, less than half of the women reportedly consumed a multivitamin/prenatal vitamin daily.

*“Since half of all pregnancies are not planned, it is essential that all women of childbearing age take folic acid daily to help prevent NTDs.”*

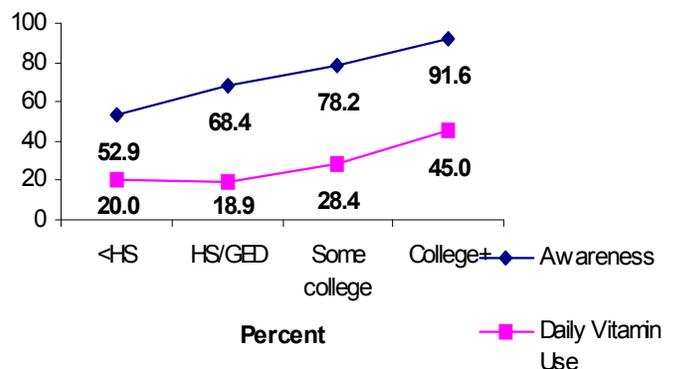
**Figure 2. Awareness that folic acid may prevent birth defects versus reported daily vitamin use by insurance type, MI PRAMS**



**Figure 3. Awareness that folic acid may prevent birth defects versus daily vitamin use by selected maternal characteristics, MI PRAMS 2004-2006**



**Figure 4. Awareness that folic acid may prevent birth defects versus daily vitamin use by maternal educational attainment, MI PRAMS 2004-2006.**



## PREDICTORS OF MATERNAL NON-DAILY MULTIVITAMIN/ PRENATAL VITAMIN USE, MI PRAMS 2004-2006

After adjustment for potential confounders, non-Hispanic black women were significantly less likely to be non-daily vitamin users (OR=0.71; 95% CI 0.54-0.92) compared to non-Hispanic white women. However, Hispanic women were 37% more likely to be non-daily vitamin users, but this result did not reach statistical significance. Interestingly, women who completed high school/earned a GED had a higher odds of not consuming a daily vitamin than women with less than a high school education (OR 2.50 vs. 1.72, respectively). This may be reflective of more parental support for women with less than a high school education since over 95% of them were under the age of 18 and most likely reside in the same household as their parents/guardians. Not receiving instruction by health care professionals on how to get enough folic acid, reporting a pregnancy as unintended and not being married were all significantly associated with non-daily

**Table 1. Odds ratios (OR) and 95% confidence intervals (CI) of association of risk factors for non-daily multivitamin consumption, PRAMS 2004-2006**

<i>Characteristic</i>	<i>OR</i>	<i>95% CI</i>
<b>Race/Ethnicity</b>		
Non-Hispanic white	1.0	reference
Non-Hispanic black	0.71	(0.54, 0.92)
Hispanic	1.37	(0.85, 2.22)
Asian/Pacific Islander	1.0	(0.57, 1.77)
American Indian	0.69	(0.20, 2.43)
<b>Maternal Education</b>		
College degree or higher	1.0	reference
Some college	1.59	(1.27, 1.98)
High school/GED	2.50	(1.96, 3.18)
Less than high school	1.72	(1.24, 2.41)
Not instructed on how to get enough folic acid	1.76	(1.46, 2.14)
Unintended pregnancy vs. intended	2.46	(2.00, 3.02)
Not married vs. married	1.49	(1.17, 1.89)
Prenatal care in the 1 <sup>st</sup> trimester	1.0	(0.79, 1.32)

vitamin consumption. Also, receiving prenatal care in the first trimester had no association with vitamin consumption nor did it affect any of the other estimates. Further research is needed to understand the reasons why women choose not to consume a daily multivitamin.

**Recommendations:**

Because NTDs occur very early in pregnancy

when most women don't realize they are pregnant, folic acid awareness campaigns must target both women of reproductive age, and adolescents approaching reproductive age. Educational campaigns about the importance of consuming folic acid daily among women not planning on becoming pregnant are very important considering nearly half of all pregnancies are not intended.



**References:**

1. Recommendations for the use of folic acid to reduce the number of cases of spina bifida and other neural tube defects. MMWR 1992;41 (RR-14): 1-7
2. Food and Drug Administration. Food additives permitted for direct addition to food for human consumption; folic acid (folacin), final rule. Fed Regist 1993;58:53254-95
3. Use of Supplement Containing Folic Acid Among Women of Child-bearing Age—United States, 2007. MMWR 2008; 57(01);5-8
4. Brain and Spinal Cord Defects. The Merck Manuals Online Medical Library. 16 Dec 2008. <http://www.merck.com/mmhe/sec23/ch265.html>
5. NINDS Anencephaly Information Page. NIH National Institute of Neurologic Disorders and Stroke. 16 Dec 2008. <http://www.ninds.nih.gov/disorders/anencephaly/anencephaly.htm>



**January Is...**



**National Birth Defects Prevention Month  
and  
January 5-11, 2009 is National Folic Acid  
Awareness Week.**

For more information, visit the website of the National Council on Folic Acid at <http://www.folicacidinfo.org>

Michigan Department  
of Community Health



Jennifer M. Granholm, Governor  
Janet Olszewski, Director

201 Townsend Street  
P.O. Box 30195  
Lansing, MI 48909

Past and current editions of the  
MI PRAMS Delivery are  
available electronically at:  
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## ABOUT MICHIGAN PRAMS

The Pregnancy Risk Assessment Monitoring System (PRAMS), a population-based survey, is a CDC initiative to reduce infant mortality and low birthweight births. It is a combination mail/telephone survey designed to monitor selected self-reported maternal behaviors and experiences that occur before and during pregnancy, as well as early-postpartum periods of women who delivered a live infant in Michigan. Information regarding the health of the infant is also collected for analysis. Annually, over 2,000 mothers are selected at random to participate from a frame of eligible birth certificates. Women who delivered a low birthweight infant were over-sampled to ensure adequate representation. The results are weighted to represent the entire cohort of women who delivered a live infant during that time.

## SUGGESTED CITATION

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