Neural Tube Defects (NTDs) are serious birth defects of the spinal cord and brain. The occurrence of an NTD in a newborn is reported to the Michigan Birth Defects Registry (MBDR)\(^1\).

**Background**
- Per MBDR reporting (1995-2003), the state birth prevalence is 5.8 NTDs per 10,000 live births (~1,000 cases).
- Many Michigan counties have a NTD rate higher than the state average.
- Prevention of up to 70 percent of NTDs can be accomplished by daily consumption of 400 mcg folic acid before conception and very early in pregnancy.
- Michigan Pregnancy Risk Assessment Monitoring System (PRAMS) Survey\(^2\) shows 29% of Michigan women age 18-45 years consume a multivitamin daily.
- National average of 33% daily multivitamin consumption reported by the March of Dimes Gallup Poll in 2005\(^3\).

**Results**
- Percentage (n) of correct responses by clinic staff
  - Percentage (n) of correct responses by clinic staff
  - Staff were from 4 Planned Parenthood and 2 WIC agencies
  - Trainees included Dietitians, Nutritionalists, Registered Nurses, Nurse Practitioners, Social Workers, and Medical Assistants
  - Pretests (n=34) and Posttests (n=35) containing 16 items to test folic acid knowledge were administered
  - Results showed increases in knowledge in all but one parameter (Figures A & B)

**Methods**
- Using MBDR data, Michigan counties with high rates of NTDs were identified and three were selected for outreach: Mecosta, Jackson, and Kent.
- **Staff training**
  - August to September 2005
  - Offered to participating Women, Infants, and Children (WIC), Planned Parenthood, and other clinic staff
  - Educational materials supplied
  - Pre- and posttests administered
  - Assured consistency in staff knowledge of purpose, protocol and delivery of folic acid message
- **Target population**
  - Non-pregnant women of childbearing age, 18 years or older receiving services at clinic site

**Purpose**
- Increase awareness and consumption of folic acid among non-pregnant women of childbearing age by providing folic acid education and free multivitamins with folic acid in selected high NTD-rate Michigan counties.

**Follow-up survey**
- December 2005 to March 2006
- Brief telephone survey (8 items) administered to 199 vitamin recipients
- Assessed vitamin usage, perceived benefits and barriers to taking a daily multivitamin

**Follow-up survey (cont.)**
- Large increase in multivitamin use reported post-outreach (Figure E)
- More than half (61.3%; n=122) reported taking a multivitamin regularly (>5 days per week); by race, African Americans had the highest percentage of utilization; by age, 25-34 year-olds had the highest utilization rate (Figure F)
- Nearly half (47.7%; n=95) took their multivitamin daily
- About two thirds (64.3%; n=128) recalled that folic acid prevents birth defects
- Most recipients recalled being given written materials
- More than half would be likely or very likely to buy the next bottle of multivitamins

**Conclusions**
- There is a need for ongoing education of health providers to address continuing gaps in knowledge and awareness of the benefits of folic acid
- Providing multivitamins as part of routine healthcare for women of childbearing age appears to be an effective method for increasing vitamin usage in this high-risk target population
- One-on-one education given by a trained health care provider reinforces positive health behaviors

**Public Health Implications**
- Free vitamin distribution combined with one-on-one education is one effective strategy for increasing folic acid awareness and utilization in low-income Michigan women
- Increasing public awareness of additional health benefits of folic acid (indicated by 44% of our survey population) is another important message that may boost folic acid consumption
- **Future Directions**
  - In 2006, outreach is expanded to Branch, Hillsdale, Ionia, Oceana, Ottawa, and St. Joseph Counties
  - In 2006, protocol is revised to outreach young women, less than 18 years of age receiving services from participating agencies
  - For 2007, enhanced outreach to higher risk populations, i.e., Hispanics, having a 1.5 to 2 fold elevated risk factor for NTD, is proposed

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**References**
1. Michigan Birth Defects Registry: [www.michigan.gov/PRAMS](http://www.michigan.gov/PRAMS)

**Figure F**
- Follow-up with clinic staff needed to assure adherence to project protocol, e.g., to outreach clients 18 years and over