

# Epidemiological and Biostatistical Limitations of Measuring the Impact of Pre and Interconceptional Care Case Management on Birth Outcomes of High-Risk Women



Tao Hou, MPH<sup>1</sup>, Carol Brady, MA<sup>2</sup>, Kimberly L. Pierce, MPH<sup>1</sup>, Thomas Bryant<sup>1</sup>, MSW, William Livingood, PhD<sup>1,3</sup>.

(1). Institute for Health, Policy and Evaluation Research, Duval County Health Department, 900 University Blvd, Suite 604, Jacksonville, FL 32211. (2) Northeast Florida Regional Council, 6850 Belfort Oaks Place, Jacksonville, FL 32216. (3) University of Florida, Pediatrics Dept, 900 University Blvd, Suite 604, Jacksonville, FL 32211.

## Introduction

The Magnolia project was initiated in 1999 in a predominantly African American Jacksonville area with considerable environmental and socio-economical deficits that impact maternal and infant health. The Magnolia Project's primary approach is case management that links social and behavioral counseling, education and support to culturally sensitive and community based clinical services for high risk women before they become pregnant (again). An evaluation to test a research design for statistical inferences related for birth outcomes and the factors influencing birth outcomes. The purpose of this poster is to present epidemiological and biostatistical challenges in measuring distal birth outcomes of a pre-and inter-conceptional case management intervention.



Figure 1. Case Manager (right) with Client (left)

## METHODOLOGY

An evaluation protocol, combining qualitative and quantitative methods, was approved by University of Florida and the Florida Department of Health Institutional Review Boards. A retrospective study was used to test statistical inferences before and after case management through a quasi-experimental design.

### Sampling

The intervention group consisted of Magnolia clients who received case management services for at least 90 days (2000-2005) and whose cases were subsequently closed (n=222). A control group was selected using Health Management System (HMS) service records (2000-2005) of clients from a predetermined high risk area who matched with Magnolia's risk assessment criterion and who utilized similar DCHD services. Selection criteria were applied to identify eligible clients, followed by simple random selection without replacement of the control group.

### Analysis

A multiple matching criterion was established at a 1:2 ratio to increase statistical power, reduce sampling error, and reduce Type I error. Two additional groups, Non-Magnolia clients within the Magnolia project's area and Magnolia clinic only clients, were used to compare birth outcomes and factors influencing birth outcomes pre and post intervention. Datasets were linked and stripped of personal identifiers through SAS programming for confidentiality during analysis. Statistical tests were used to assess statistically significant differences at the .05 level and .10 level (marginal significance) between the control and intervention groups.

## Limitations

- ✓ Matching Process used to select control group yielded control group with lower risk than intervention group
- ✓ Matching process has potential to obscure potential effects of other confounding variables
- ✓ Small sample size
- ✓ Discrepancies in self reporting and Florida's STD surveillance System
- ✓ Inconsistency with program implementation

## Conclusions

Although the results were promising with improved birth outcomes and STDs of Magnolia case management clients, limitations presented challenges in demonstrating conclusive results. According to a power estimation procedure, a sample size of 11,604 live births is needed within the intervention group for a 1% change to be statistically significant.

## Public Health Implications

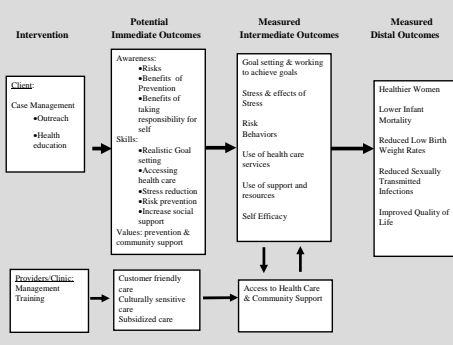
Expansion of the project to include larger numbers of participants or to involve other locations with additional high risk populations is warranted by these results. Also, the study demonstrates the need to focus on birth outcomes that are more common and on the factors that are highly related to birth outcomes when measuring the intervention's impact.



Figure 2. The Magnolia Project Women's Health Center

## Evaluation Logic Model

### Pre and Interconceptional Case Management



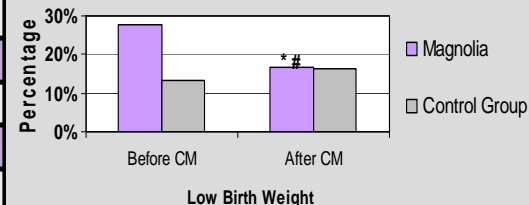
## Results

Table 1. Comparison of Sexually Transmitted Diseases: Magnolia Case Management (CM) Clients and Control (Non-Magnolia Clients), 1995-2005

	Magnolia CM Clients N=222		Control Group N=412	
	Frequency	Percent	Frequency	Percent
Repeat STDs	24	10.8	33	12.9
After CM Only	23	10.4	69	16.7
No Post STDs	175*	78.8	290	70.4

\*p-value=.02  
Source: Florida Department of Health of Sexually Transmitted Disease Bureau

Figure 3. Comparison of Birth Weights: Magnolia Case Management Clients (CM) to Non Participants 1995-2005



\* P value=.066 ( Magnolia Before CM vs After CM )  
# P value=.067 ( Magnolia (Before CM vs After CM) vs Control (Before CM vs After CM) ]  
Source: Duval County Health Department-Health Management Systems (HMS)

