Addressing the links between maternal education, prenatal care utilization and infant mortality:

Analysis of DC infant mortality 1996-2005

Conducted by the GWU School of Public Health Global Health Methods Class
Tracey Smith ● Erinn Nanney ● Elizabeth Cannon
Saraswati Khalsa ● Erin McCarty
Shella Efon ● Sonja Tanaka ● Becca Levine
Instructor: Sarah Orndorff, Ph.D.

Description of the Data Set

- Compiled and analyzed linked infant birth/death records from 1996-2005
  - 1999 could not be analyzed due to missing data
- Data was initially cleaned, coded, and analyzed through SPSS
- Merged select variables from each year into single data set
- Total of 859 infant death cases

Selection of Variables for Analysis

- Recognized multitude of factors associated with infant mortality

- Selection of Maternal Education and Number of Prenatal Care Visits due to:
  - Strength of association between variables and IM in body of literature
  - Assessing disparities in educational attainment and health care access
  - Consistency within data sets

Hypotheses

1. That the average level of education within the data set will be lower than the average level of education in DC

2. That the average number of prenatal care visits will be lower than generally recommended

3. That there will be a positive correlation between years of maternal educational attainment and number of prenatal care visits

Review of Infant Mortality in DC

- 12/1000 Total Infant Mortality Rate, 2000
- 8th highest rate among 47 "Big Cities"
  - ***cities for comparison
- 1990-2003 saw decrease in DC rates: 20.7 – 10.94
- However[1,2], disparities still exist between ethnic/racial groups:
  - White, 4.79/1000
  - Black, 14.42/1000
- DC does perform relatively well in categories of teen pregnancy, fertility, and maternal smoking

1. Benbow. Big Cities Health Inventory. 2003.
2. National Vital Statistics Report. 2006.

Educational Attainment

- US Residents over the age of 25 with a
  - HS diploma: 80.4%
  - Bachelor's degree or higher: 24.4%
- DC Residents over the age of 25 with a
  - HS diploma: 77.8%
  - Bachelor's degree or higher: 39.1%

Maternal Education and Infant Mortality

2006 NVSR US Infant Mortality Statistics by Years of Education

Years of Education of Mother	Rate of Infant Mortality	Number of infant deaths
0-8	6.99	1634/ 233,843
9-11	9.35	5503/ 588,289
12	7.66	8903/ 1,162,705
13-15	6.21	5045/ 811,986
16+	4.24	4296/ 1,012,739

* Disparities in protective benefits of education occur between white and black mothers

Prenatal Care: Number of Visits vs. Adequacy

- Avg. number of PCV within the data set: 6.09

- Mothers who receive adequate prenatal care

  - 47 "Big Cities": 71.5%

  - DC: 63.2%'

- Defining "adequate" prenatal care

  - ACOG: 13 visits for normal pregnancy

  - WHO: 4 visits at specified intervals for normal pregnancy

Data Findings

- Number of Prenatal Care Visits
  - 635 valid cases (73.9%)
  - Range: 0-37 visits
  - Mean: 6.09 visits
  - Mode: 5 visits

- Maternal Education
  - 648 valid cases (75.4%)
  - Range: 0-17 years
  - Mean: 11.96
  - Mode: 12

Data Findings

- Cross Tabulation of Maternal Education and Number of Prenatal Care Visits

  # and % mother's who attended below the average 6.09 prenatal visits for each education level

  0-8 years ed 24 cases, 66.7%

  9-11 years ed 71 cases, 58.6%

  12 years ed 156 cases, 63.9 %

  13-15 years ed 38 cases, 50.7%

  16 -17 years ed 27 cases, 40.9%

Discussion

- Comparable averages of maternal education and DC educational attainment indicate increased maternal education may not play a protective role against IM in DC

- While number of visits is significantly lower than ACOG recommends, still higher than WHO recommendation

- Adequacy, quality, access… High rates of low birth weight may reflect lack of adequacy

- Within the data set, there was no clear correlation between increased level of maternal education and increased number of prenatal care visits until after 12 years of education had been attained

Limitations

- Limitations:
  - missing data
  - inconsistent labeling of variables/inability to label
  - lack of birth statistics for DC and by level of education
  - change in mortality codes
  - lack of data concerning adequacy/quality and timing of care

Recommendations for Further Research Within the Data Set

- Revisit the data to determine adequacy levels
  - Further analysis of month of initiation of prenatal care visits
  - May require more in depth, qualitative analysis
- Further trend analysis of additional variables, ie cause of death, smoking, birth weight

Recommendations for Further Research at the Community Level

- Determining what barriers exist to accessing adequate care through:
    - Identifying barriers to initiating and maintaining regular care
    - Assessing quality of prenatal care programs that are being accessed
- Examining issues related to post-natal care: level of utilization/access and quality
- Examining barriers to completion of birth/death records by health profs; Encouraging more consistent and complete recording