

# Maternal and Child Health Report

*Focus on Hamilton County Women and Children*

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## Measuring Deprivation in Hamilton County Neighborhoods

The topic of this month's Maternal and Child Health Report is the results of our program's newly created Deprivation Index. This index was created in order to try to quantify and compare the extent of social and economic deprivation among Hamilton County neighborhoods.

Previous newsletters have reported large neighborhood level differences in health outcomes (November 1999 "Low Birthweight in Hamilton County") as well as economic and social disparities such as education levels, unemployment, mobility, and per capita income (August 1999 "Social Characteristics of Hamilton County Neighborhoods).

The recently created Deprivation Index is the initial stage in our ongoing process of attempting to identify predictors of poor health outcomes in Hamilton County neighborhoods.

This newsletter briefly describes the creation of the index as well as reports preliminary findings of neighborhood rankings using the Deprivation Index.

### **Creation of the Deprivation Index**

The first step in the creation of the index used a statistical technique called factor analysis. Factor analysis is a data reduction technique used to create more concise causal models and test independent variables for interrelatedness. It is often used when there are large numbers of independent (causal) variables. Factor analysis allows variables which naturally group together to be combined into a scale or index.

The results of the factor analysis showed that five variables "loaded" (correlated) with the factor (new variable) strongly. This new factor was termed *economic deprivation*.

The five variables were : percent adults with no high school diploma, percent of children below poverty, percent of households receiving public assistance, percent unemployed, and percent of families that are female-headed households with children.

In order to transform the variables into a standardized measure, the value of each of the five variables for each neighborhood were converted into z scores and then summed. Z scores measure the number of standard deviations a value is from the mean. For example, on a normal curve, the mean is in the middle and values farther away from the middle have higher or lower z scores.

Each neighborhood then had a value that represented the number of standard deviations away from the mean for each of the five variables. For example, a neighborhood with a very few households on public assistance and a low unemployment rate, etc... would be below the average and have a large *negative* z score (least deprived).

To convert the z scores to a more understandable scale, a few simple calculations were done to make all values positive, resulting in an index with values of 0 to 10.

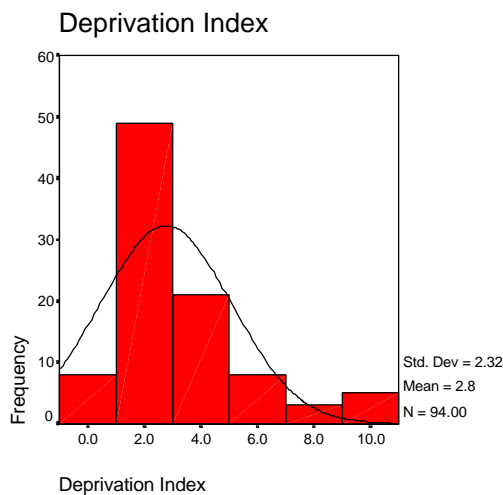
The final result was a deprivation index with each of the 95 neighborhoods/ municipalities in Hamilton County assigned a score of 0 to 10, with 0 being least deprived and 10 being most deprived.

## **Results**

In general, most neighborhoods/municipalities had low scores, meaning they had low levels of deprivation.

As the figure below shows, the most common deprivation scores were between 1 and 3 out of a possible 10.

Several neighborhood had 0 as a deprivation score, while one neighborhood had a score of 10 (Over the Rhine) and four neighborhoods had a score of 9 (see Page 3 for a full listing of deprivation scores).



Another notable finding was that the mean deprivation score for Hamilton County municipalities (excluding city of Cincinnati) was 1.8. This was lower than the mean deprivation score for neighborhoods within the City of Cincinnati ( $x = 3.7$ ). The mean for all 94 communities was 2.8 (a score could not be computed for Queensgate due to missing data).

## **Uses of Deprivation Index**


The next phase of this project is to test the effectiveness of the deprivation index at predicting health outcomes in county neighborhoods. The deprivation index will be compared to other statistical models to determine how well it predicts variation in health behavior and health outcomes such as poor prenatal care,

low birth weight, very low birthweight, infant mortality, maternal smoking, and teen births. If independent variables which were originally deleted from the deprivation index through the use of factor analysis are found to be better predictors of health outcomes, then the deprivation index can be modified in order to find the best explanatory model.

<sup>1</sup> Sanders, B. (1999) "Low Birthweight and Very Low Birthweight in Hamilton County 1997-1998." Maternal and Child Health Reports v4(10).

<sup>2</sup> Sanders, B. (1999) "Social Characteristics of Neighborhoods in Hamilton County." Maternal and Child Health Reports v4(7).

**WCHOP**



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## **Complete List of Deprivation Index Scores**

### Score of 0

(8) Amberley Village, Evendale, Hyde Park, Indian Hill, Mt. Lookout, Montgomery, Mariemont, Terrace Park

### Score of 1

(22) Anderson Twp, Blue Ash, California, Clifton, CBD/Riverfront, Colerain Township, Delhi Township, Deer Park, Forest Park, Green Township, Greenhills, Glendale, Madeira, Mt. Adams, Miami Township, Mt. Lookout/Columbia Tusculum, Mt. Washington, Symmes Township, Sycamore Township, Sharonville, Springdale, Wyoming.

### Score of 2

(27) Columbia Township, Cheviot, College Hill, Crosby Township, Fairfax, Fairview/Clifton Heights, Golf Manor, Hartwell, Harrison, Harrison Township, Kennedy Heights, Loveland, Mt. Airy, Mt. Healthy, North College Hill, North Avondale/Paddock Hills, Oakley, Pleasant Ridge, Reading, Roselawn, St. Bernard, Sayler Park, Springfield Township, University Heights, West Price Hill,, Westwood, Woodlawn.

### Score of 3

(13) Bond Hill, Carthage, Cleves, East Walnut Hills, Evanston/E.Walnut Hills, Madisonville, Newtown, Norwood, North Bend, Riverside/Sayler Park, Silverton, Whitewater Township, Winton Place.

### Score of 4

(8) Addyston, Arlington Heights, Corryville, East Price Hill, Elmwood Place, Evanston, Lockland, Northside.

### Score of 5

(4) Linwood, Mt. Auburn, Sedamsville-Riverside, South Fairmount.

### Score of 6

(4) Avondale, Camp Washington, East End, Walnut Hills.

### Score of 7

(1) Lincoln Heights

### Score of 8

(2) Lower Price Hill, North Fairmount/English Woods.

### Score of 9

(4) Fay Apartments, South Cumminsville/Millvale, Winton Hills, West End.

### Score of 10

(1) Over-the-Rhine

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