

Title:

Can WIC Measurements of Height and Weight be used for Epidemiologic Investigations?

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**Background** There is increasing awareness that poor neighborhoods in the United States frequently do not have supermarkets or grocery stores that carry affordable fresh produce. This limited access to fresh produce could challenge the efforts of the federally funded Supplemental Nutrition Program for Women, Infants and Children (WIC) to promote healthy eating among low income children aged 5 years or younger. Hence, an important research question is whether WIC children who live in such neighborhoods are at higher risk of developing obesity. The Data Mining Project (DMP) is an effort initiated by the Public Health Foundation Enterprises WIC Program (PHFE WIC), the largest WIC program in the country, with support from the California Department of Public Health WIC Program, to gather and maintain anthropometric, socio-demographic and geographic information on ~ 600,000 WIC families in Los Angeles (LA) County. The data quality of administration records such as height and weight measurements in the DMP database is of key importance in the use of such data for research. The aim of this study was to determine the accuracy of height and weight measurements of children collected by WIC programs in LA County so as to confirm their usability for investigating the influence of neighborhood food environments on child obesity development.

**Hypotheses** (1) WIC height and weight measurements do not suffer from measurement bias and can be used for epidemiologic investigations; and (2) the accuracy of WIC height and weight measurements do not vary by age or gender.

**Methods** A sample of 367 children aged 2-5 years were recruited from seven PHFE WIC sites in LA County and measured by trained research assistants using standardized protocols. Using Pearson's correlation coefficient and linear regression, these measurements were compared to measurements taken and recorded by WIC staff during the usual WIC appointment. WIC staff was blind to the study hypotheses. Sensitivity and specificity of BMI for determining overweight/obese status were also estimated.

**Results** Comparison of WIC and research protocol measurements for children who met study criteria revealed high correlation: height ( $r=.97$ ), weight ( $r=.99$ ), and BMI percentile ( $r=.90$ ). Sensitivity and specificity of BMI for determining overweight/obese status were 0.82 and 0.92, respectively. Correlation coefficients were similar among children of varying ages and gender.

**Conclusion** WIC height and weight measurements are sufficiently accurate for examining associations between the neighborhood food environment and child obesity risk.