Impact of WIC program participation on food expenditures

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Abstract

OUR STUDY INVESTIGATES the relationship between participation in the Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC) and purchases of WIC related foods. Data from the Nielsen Homescan data 2009 to 2010 provide information on food expenditures, household demographics and report WIC participation status during a period of changes in the program benefits. In this analysis, we assess how participation in the WIC program relates to purchases of whole grain products.

Background

THE WIC PROGRAM is designed to improve healthy eating behaviors of the targeted groups of people: pregnant and lactating women, infants, and young children less than 5 years old. Under the program, participants are able to acquire specific foods designated in the WIC food package. Although WIC is one of the major US food assistance programs, there are relatively few studies about the effect of WIC on food acquisition. Among recent studies there is some evidence of a positive association between WIC participation and consumption of some foods in the WIC package (Olivera and Chandran, 2005; Ponu, et al., 2006). Better understanding of the relationship between WIC participation and food acquisition can help to improve the design and effectiveness of the WIC program.

Empirical Methodology

Our approach to WIC program evaluation adopts the counterfactual framework by Rubin (Rubin, 1974). The treatment variable, w, ε (0,1) refers to whether household participates in the WIC program or not. Let y and y be the outcomes with treatment and without treatment. The observed outcome for household i is given by: y = y + (1− w)y . Our objective is to identify the average treatment effect on the treated on whole grain expenditures (Table 1).

Propensity Score Matching

Participation model: Based upon the main assumptions for adequate matching, we first conduct an estimation of the treatment program participation model to characterize the propensity score using a Logit model (Rosenbaum and Rubin, 1991).

Matching estimators: After we characterize the expected probability of program participation, the propensity score, the next step is to determine the matching estimator which will combine a treated group with a non-treated group with equal propensity score to estimate the counterfactual outcome. We compare the results employing different matching algorithms: nearest neighbor matching and kernel matching.

Discussion

• WIC households have higher whole grain expenditures (Figure 2).
• Households participating in WIC at least one-year have more whole grain expenditures than non-participating households (Table 2).
• These results are consistent across different matching procedures.
• When whole grains expenditure were expressed as a ratio of whole grains to total grain expenditure, there were no differences observed across all groups and methods.

Table 1. Summary statistics of monthly weighted average grain expenditures (all households)

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined Grain</td>
<td>11.12</td>
<td>7.20</td>
<td>0.98</td>
<td>64.38</td>
</tr>
<tr>
<td>Whole Grain</td>
<td>5.88</td>
<td>3.64</td>
<td>0.00</td>
<td>43.29</td>
</tr>
</tbody>
</table>

Table 2. Treatment effects of WIC participation on whole grain expenditures

<table>
<thead>
<tr>
<th>Participation model</th>
<th>One-Year Participation</th>
<th>Two-Year Participation</th>
<th>PT</th>
<th>One-Year Participation</th>
<th>Two-Year Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Propensity Score Matching</td>
<td>0.928</td>
<td>0.5443</td>
<td>0.7152</td>
<td>0.7982</td>
<td>1.2191*</td>
</tr>
<tr>
<td>Matching Estimators</td>
<td>1.0135**</td>
<td>1.262***</td>
<td>1.093***</td>
<td>1.159***</td>
<td>1.453***</td>
</tr>
</tbody>
</table>

References


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