Children and Youth Services Review 69 (2016) 82–96

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

The impact of aging out of WIC on food security in households with children

Irma Arteaga [a,*], Colleen Heflin [b], Sara Gable [c]

[a] Truman School of Public Affairs, University of Missouri, 229 Middlebush Hall, Columbia, MO 65211, United States
[b] Truman School of Public Affairs, University of Missouri, 216 Middlebush Hall, Columbia, MO 65211, United States
[c] Nutrition and Exercise Physiology, University of Missouri, 312 Gwynn Hall, Columbia, MO 65211, United States

ARTICLE INFO

Article history:
Received 21 March 2016
Received in revised form 21 July 2016
Accepted 21 July 2016
Available online 2 August 2016

Keywords:
Food insecurity
Regression discontinuity design
Program evaluation
WIC

ABSTRACT

Correlational research suggests that disadvantaged families with young children who are food insecure often participate in the Women Infants and Children program (WIC). While there has been a considerable amount of research on the association between WIC participation and food insecurity, these studies have reported mixed findings and do not explore the effects of WIC at a critical age, when children turn five years old. This paper estimates the effects of aging out of WIC on rates of household food insecurity using the exogenous rule that children are eligible for the WIC program until the day before they turn 61 months old. Using a regression discontinuity design and the Early Childhood Longitudinal Study Birth-cohort dataset, we find that there is an increase in rates of food insecurity for children who become age-ineligible for WIC (i.e., reach 61 months of age) and who have not yet started kindergarten. Furthermore, this effect is robust under different models, bandwidths and analytic samples.

1. Introduction

Food insecurity, defined by the US Department of Agriculture (USDA) as not having consistent access to enough food for an active, healthy life, is a significant social problem in America. In 2014, 14% of all American households were food insecure, and the prevalence rate grew to 1 in 5 when focusing specifically on households with children. Whereas the recent economic recovery can be seen through improvements in other social indicators, such as the official unemployment rate, food insecurity has remained elevated relative to pre-recession levels since the beginning of the Great Recession in 2008 (Coleman-Jensen, Gregory, & Singh, 2014).

Due to the existence of targeted programming designed to address the food insecurity of specific types of American children and families, the US federal food and nutrition safety net has evolved into a patchwork system of programs. Individual food and nutrition program benefits may be delivered in the form of vouchers, near cash supplements, or directly as food. Moreover, these services may be available to specific members of the household or to the entire household. Program eligibility may depend on household income; alternatively, children may be eligible for a different program because of their age and the income level of others in their child care or school. As a result, households with similar income levels and numbers of children may receive substantially different bundles of food assistance. One major transition point in the types of food and nutrition programs for which households and children qualify occurs as children reach age five and become eligible to enter kindergarten.

In this study, we use the nationally representative Early Childhood Longitudinal Study-Birth Cohort (ECLS-B) to estimate changes in rates of household food security as children become age-*ineligible* for the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). The next section reviews the previous literature evaluating WIC and Section 3 briefly describes the data and the variables used in our analysis. In Section 4, we discuss our empirical strategy, in Section 5 we test the assumptions of the statistical method used and, in Section 6 we describe our results. Our main finding is that families with children around 61 months of age experience an increase in household food insecurity, which we interpret as the effect of becoming age-ineligible for WIC. The paper concludes with a discussion, the limitations of our approach, and policy implications of the results.

2. Literature review

WIC is the specialized federal food and nutrition assistance program designed specifically for pregnant and lactating mothers and children

* Corresponding author.
E-mail addresses: arteagai@missouri.edu (I. Arteaga), heflincm@missouri.edu (C. Heflin), gables@missouri.edu (S. Gable).

http://dx.doi.org/10.1016/j.childyouth.2016.07.015
0190-7409/

from birth to age five. WIC provides supplemental food assistance, nutrition education, and health referrals to low-income pregnant and post-partum women, and to children under age five who are at nutritional risk. In order to be eligible, household gross income must be below 185% of the federal poverty line (for household size) or households must participate in Medicaid. In 2013, at a cost of 6.5 billion dollars, 8.7 million individuals participated in WIC every month, including about half of all babies born in the United States. A common misconception about WIC is that participation is limited to infancy, when the food package contains only infant formula. In 2012, 23% of participants were infants, 23.6% were pregnant or parenting women, and about 54% were children between 1 and 5 years of age.[1] According to recent estimates, 16.5% of children who received WIC participated into their fourth year, representing 857,000 children (Johnson et al., 2013).

Studies of the effects of WIC participation have typically focused on maternal and infant health, and suggest that participation improves pregnancy and birth outcomes (Bitler & Currie, 2005; Kennedy, Gershoff, Reed, & Austin, 1982). The focus on women and infants' health is likely because improving nutrient intake and health outcomes among pregnant women and infants is a stated goal of the WIC program. There are a small number of studies that extend beyond individual health and examine the relationship between WIC participation and household food insecurity, but these studies have mixed findings and do not typically use an identification strategy that allows for causal inferences. For example, Metallinos-Katsaras, Gorman, Wilde, and Kallio (2011) used administrative data from Massachusetts WIC participants to longitudinally study the relationship between length of WIC participation and food security among low-income mothers and children. Using logistic regression, these authors found that among children who had either an initial status of low food security or very low food security, multiple clinic visits appeared to lower the risk of food insecurity by between 4 and 12%. However, it is important to note that the authors did not account for unobserved differences between women and children who met their criteria for inclusion in the sample and those who did not, thus introducing potential selection bias.

In another study, Black et al. (2004) analyzed multi-site hospital interviews from caregivers of WIC-eligible infants living in five states and Washington D.C. This study found that caregivers who reported no WIC participation because of program access problems also reported food insecurity at higher rates, compared to caregivers who reported no problems with accessing WIC (28% compared to 23%, $p = 0.05$). However, this difference was not statistically significant in subsequent multivariate regression analyses that controlled for other factors associated with food insecurity. Once again, it is important to note that this study controlled only for observed characteristics and did not address potential selection bias due to unobserved factors.

Other research that examines the relationship between WIC participation and food security suggests important variation among participants that could make selection bias a problem. Specifically, prior research finds that WIC participants and WIC-eligible non-participants differ in systematic ways (Bitler & Currie, 2005) confirming concern raised by Besharov and Germanis (2001) that WIC participants differ in terms of initial health, motivation, and access to health care. These differences indicate that selection bias left unaddressed is likely to obscure the relationship between WIC and food security. Indeed, existing research has had difficulty identifying the causal impact of WIC participation, most likely due to the presence of selection bias (Kreider, Pepper, & Roy, 2016).

A few studies have attempted to address the selection problem using instrumental variable models, but because WIC eligibility rules do not vary measurably across states or over time, these models have been difficult to implement. Models could instrument using WIC eligibility based on categorical eligibility through Medicaid participation, but this variable might not be exogenous to food insecurity outcomes. This, in turn, would violate the non-exclusion restriction of the instrumental variable method. Additionally, even when differences do exist across states (e.g. recertification rules), if unobserved differences at the state level are also associated with WIC participants' nutritional habits, it would prevent the model from estimating a consistent effect of aging out of WIC on food insecurity.

Lee and Mackey-Bilaver (2007) examined the effects of WIC and Supplemental Nutrition Assistance Program (SNAP) participation on different child outcomes, including nutritional deficiency. These researchers addressed the selection problem using a rich dataset and different identification strategies. For example, with a sibling-fixed effects model, they found that participating in WIC alone or jointly with SNAP reduced nutritional deficiency. However, they did not find evidence of a program participation effect when using an instrumental variable approach. The authors determined that their instrument, distance to WIC sites and/or local health department offices, was not ideal.

Kreider et al. (2016) addressed the selection bias issue by developing a partial identification bounding model. Under the strictest assumptions, the authors concluded that among their population of infants and children who participated in WIC, food insecurity rates were 5.5 percentage points lower and very low food security rates were 1.5 percentage points lower. In their bounding method, the authors specified the treatment effect based on extreme cases of measurement error where individuals misreported their participation in WIC. Then, under assumptions of monotone treatment selection, monotone instrumental variable, and monotone treatment response, they computed an estimate of the average treatment effect.

Our study contributes to the prior literature on food insecurity by using an empirical strategy that examines the causal effect of nutrition program policy on food insecurity in households with children at a developmentally critical age. Specifically, we estimate changes in rates of food security as children become age-ineligible for WIC, thus exploiting a discontinuity in WIC participation that is directly related to child age. According to federal WIC program eligibility rules, children remain eligible for WIC until their fifth birthday. On their fifth birthday, WIC eligibility ends, presumably because most children are expected to start kindergarten and transition to the school-based, free and reduced-price food programs. We use a regression discontinuity design (hereafter, RD) that compares children on either side of the 61-month age cut off, i.e., a few months before or after the 61 month cutoff. Our primary identification assumption is that the observed and unobserved determinants of food insecurity are likely to be distributed smoothly across the 61-month cutoff. Given this assumption, the changes in rates of food insecurity at 61 months of age can be attributed solely to aging out of WIC.

3. Data

This study uses data from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a study conducted by the National Center for Education Statistics (NCES) to examine the development, health and learning environment of a single cohort of US children who were born in 2001. The ECLS-B utilizes a multi-reporter, multi-method design to gather extensive information about children's homes, parenting practices and behavior, as well as educational experiences. The ECLS-B was designed to be nationally representative when sample weights are

[1] Note that households with younger siblings may continue to receive assistance when an older sibling turns age 5. However, the nutritional assistance is not intended to be consumed by the older sibling.