

The 1996 overhaul of the U.S. welfare system introduced important changes to the way that federal and state governments provide child care assistance to low-income families. The Welfare Reform Act consolidated the child care subsidy system into a single Child Care and Development Fund (CCDF) and increased funding to facilitate the movement of welfare recipients into employment. States were also granted increased flexibility in program design and implementation. In 2005, states spent about \$9.4 billion on child care subsidies and served an average of 1.7 million children per month.

Although a large number of studies examine the impact of subsidies on low-income mothers' employment and child care utilization, researchers have largely ignored the question of whether subsidies have implications for child development, including obesity. There are two primary channels through which child care assistance policies can influence child outcomes. First, mothers must be employed to be eligible for a subsidy, and research evidence points to a negative relationship between maternal employment and childhood obesity. Second, there are a number of design features associated with the CCDF that have implications for the quality of care purchased with subsidies. Indeed, a sizable literature finds that subsidized children receive lower quality care than unsubsidized, low-income children.

In this paper, we explore the relationship between child care subsidy receipt and obesity. Our analysis draws from the Early Childhood Longitudinal Study-Kindergarten cohort (ECLS-K), a nationally representative sample of 21,260 children attending kindergarten in the fall of 1998. Children in the ECLS-K are followed through the eighth grade, with detailed parent, child, and teacher interviews conducted in the fall and spring of kindergarten (1998 and 1999) and the spring of first (1999), third (2002), fifth (2004), and eighth (2007) grade. This study is based on the fall and spring of kindergarten waves of data collection, in which children's height and weight measurements were taken and parents were

asked questions about child care attendance in the year prior to kindergarten entry. We limit our sample to 3,186 children who lived with a single mother as of the fall of kindergarten interview.

Two key outcomes are explored in this study: an indicator for whether a given child is overweight and an indicator for whether the child is at-risk of being overweight. These variables are derived from the child's Body Mass Index (BMI), which is ascertained during the fall and spring interviews. BMI is defined as weight in kilograms divided by height in meters squared (kg/m^2). Although BMI is a standard measure for defining excess weight among adults, the Centers for Disease Control (CDC) recently approved its use for children as well. We follow the CDC guidelines for age- and gender-specific BMI cut-offs to define overweight children as those with a BMI at or greater than the 95th percentile of the age- and gender-specific distribution. Children who are at-risk of being overweight have a BMI that is at or greater than the 85th percentile of the distribution. Approximately 13 percent of children in both surveys are overweight, and 30 percent are at-risk of being overweight.

The primary independent variable in our analysis is a dummy variable indicating whether a given child received subsidized, non-parental child care in the year prior to kindergarten. Parents were asked a series of questions about child care use during the past 12 months, including the number of arrangements, the amount of time that each arrangement was used, whether there was a cost associated with each arrangement, and if so, the amount paid for care. Regarding subsidy receipt, parents were asked the following: "Did any of the following people or organizations help to pay for this ... provider to care for {CHILD} the year before {he/she} started kindergarten?" Four possible choices were then presented to parents, and we code those answering "a social service agency or welfare office" as receiving

a child care subsidy.¹ Approximately 15 percent of children are coded as receiving subsidized care in the year before kindergarten.

The key empirical problem is that child care subsidies are not randomly assigned to families; in fact, states use a number of strategies to ration subsidies according to specific child/family characteristics. If there are unobserved characteristics related to both the propensity to receive a subsidy and the outcomes, the coefficient on subsidy receipt will be biased. Therefore, we take a number of steps to minimize this bias. We utilize the richness of the ECLS-K dataset and control for an extensive set of characteristics to mitigate the influence of omitted variables. A potential concern is that even our extensive set of controls may not fully account for unobserved heterogeneity. Therefore, we include in our models county fixed effects as a second attempt to eliminate unobserved heterogeneity. Finally, we estimate models with Two Stage Least Squares (TSLS), relying on exclusion restrictions to identify the impact of child care subsidies. Specifically, we use variables that determine how subsidies are rationed under the assumption that childhood obesity does not depend on the rationing mechanism, conditional on subsidy receipt. Furthermore, we assume (and provide substantial evidence) that rationing is determined at the county-level and therefore use county of residence as the identifying instruments.

Preliminary results suggest that child care subsidy receipt during the year before kindergarten increases the likelihood that children are overweight and at-risk of being overweight. These findings are robust across the various estimators. Although the magnitude of the subsidy effect attenuates somewhat between the fall and spring of kindergarten, the basic results persist over time. Our results at this point indicate that participation in center-based child care appears to be driving the impact of subsidies.

¹ Similar questions appear in several nationally representative surveys (e.g., National Survey of America's Families and the Survey of Income and Program Participation), and other researchers have constructed indicators of subsidy receipt based on them.