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CHILDCARE AND WORK: JOINT DECISIONS AMONG WOMEN IN POOR NEIGHBORHOODS OF GUATEMALA CITY

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Abstract

This study investigates the effects of childcare on work and earnings of mothers in poor neighborhoods of Guatemala City. Recognizing that mother's work status may depend on the availability of childcare, decisions to participate in the labor force and to use formal day care are modeled to allow for the possibility that they may be jointly determined. We then explore the impact of childcare prices on mother's earnings, conditional on her decision to work. Also explored is whether a mother's "status" within her household (as measured by the value of the assets she brought to her marriage) influences her entry into the labor force.

The study uses a survey of 1,363 randomly selected mothers (working and nonworking) with preschool children collected in 1999 by the International Food Policy Research Institute (IFPRI). In this random sample of mothers with preschoolers, 37 percent worked for pay in the 30 days before the survey, employed in a variety of occupations and sectors. A wide range of childcare arrangements was used: own care of the child by the mother during work, a resident household member, a nonresident family member, a neighbor, the child being left alone at home, private formal day care, and government-sponsored public formal day care.

Our results indicate that participation in the labor market and use of formal day care are, in fact, joint decisions for mothers. Life cycle and household demographic factors have important effects on both decisions. Maternal education is an important determinant of utilization of formal day care, but does not have large effects on whether she works for pay or not. Higher household wealth reduces her chances of working, presumably via an income effect. However, the value of assets she brought to her marriage increases the likelihood of her working. For formal day care, greater travel time from home reduces utilization of this type of care.

Controlling for endogeneity of labor market participation and formal day care use, childcare prices have no impact on maternal earnings. This suggests that interventions to

increase the availability of formal day care in poor urban areas have the potential to raise labor-force participation rates of mothers residing in such neighborhoods, but not necessarily their earnings, conditional upon their having entered the labor force.

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1. Introduction

High rates of urbanization and increasing levels of female participation in the labor force are beginning to increase the demand for nonparental childcare in Latin America. Emerging shifts in the structure of urban production toward more manufacturing and industry mean that employment opportunities for women are expected to occur increasingly in settings incompatible with childcare. Market work and childcare are activities that become more separate and compete for a mother's time.

Rural-to-urban migration often means moving away from extended family, which decreases access to informal childcare givers. This situation is especially true in Guatemala. Between 1990 and 1994, the urbanization rate was 3.9 percent, compared to 2.7 percent for Latin America overall (IDB 1997). The growing rate of urbanization has also been accompanied by an increase in the number and percentage of households headed by single women. Approximately one-fifth of urban households in Guatemala—and in Latin America overall—are headed by women (FLACSO 1995; INE/Macro 1996). This is a result of several related trends: a decline in the proportion of multigenerational households and an increase in the number of single-parent families due to divorce and widowhood.[1] Moreover, half of urban female-headed households in Guatemala are poor and one-quarter is indigent, making this one of the worse-off groups in Latin America (ECLAC 1995).

This situation is fueled by a number of factors. First, such households have a low number of potential labor market participants (Sedlacek, Gutierrez, and Mohindra 1993). Second, levels of education and literacy are low. Guatemalan women have an average of 5.9 years of education, and only 73 percent are literate (ECLAC 1995); both figures are

[1] The latter is particularly prevalent in Guatemala because of deaths of males that resulted from the country's very long civil conflict. The violence in rural areas led to urban migration of women who had lost husbands or other family members (Steel 1993).

low compared with Latin American averages.[2] Among urban heads of households, female heads have an average of 1.5 fewer years of education than male heads, affecting their chances of obtaining employment, their sector of work, and their earnings. Among working household heads, the gender education gap alone translates into earnings that are 15 to 20 percent lower for women with otherwise similar characteristics to their male counterparts (Arends 1992; Funkhouser 1996). Third, urban female heads have lower levels of economic activity compared to male heads, partly due to gender education deficits that reduce female job opportunities. Finally, sectoral and occupational segregation are important factors. Many women work in the informal sector[3]—the sector accounts for approximately 63 percent of urban female employment in Guatemala—where earnings are a third of those in the formal sector (Funkhouser 1996), and in lower paying occupations considered typically female.

The higher unemployment rates and fewer working hours observed for female than for male urban heads are hypothesized to be in part due to coordination difficulties between hours and location of work and the availability of childcare. One study in Brazil (Deutsch 1998), for example, finds a lack of childcare options as a primary cause of unemployment among urban women. The scarcity of childcare options is especially crucial for unmarried women, who often choose informal sector jobs for their flexibility, despite their low returns.

Does availability of childcare affect women's work and earnings? This study attempts to answer this question by analyzing work, childcare arrangements, and earnings of mothers in poor urban neighborhoods of Guatemala City. The study is based on data from a random sample of 1,300 mothers with preschool children residing in one poor neighborhood of Guatemala City in 1999. The data were designed by the authors and

[2] These averages mask large differences by age and ethnicity: younger and nonindigenous women have more access to schooling and thus higher education levels. Many older and indigenous women who migrated to urban areas as adults were raised in rural areas, where schools are not widely available or accessible.

[3] Funkhouser (1996) defines the informal sector as all self-employed workers and workers in firms of four or fewer employees who are not professional, technical, or administrative.

collected as part of an impact evaluation of the *Hogares Comunitarios* government-sponsored day-care program by the International Food Policy Research Institute (IFPRI).[4] This report differs from previous studies on childcare choice that take mothers' labor-force participation as given. Although those who demand childcare are for the most part working mothers, if a mother's work status is influenced by the availability of childcare, any examination of the determinants and consequences of childcare choice should not be conditioned upon her work status. This survey was designed to address this difficult issue. Information on a mother's current situation, her family background, her current household, her children, and her community was solicited from *all* mothers, working and nonworking, so that care choices could be examined in conjunction with a mother's labor-force activities.

Our results indicate that participation in the labor market and use of formal day care are, in fact, joint decisions of mothers. Life cycle and household demographic factors appear to have important effects on both decisions. Maternal education is an important determinant of utilization of formal day care, but it does not have large effects on whether she works for pay or not. Higher household wealth reduces her chances of working, presumably via an income effect. However, the value of assets she brought to her marriage increases the likelihood of her working. Greater travel time from home reduces utilization of this type of care. Controlling for endogeneity of labor market participation and formal day care use, day care prices do not significantly affect earnings. This suggests that interventions to increase the availability of formal day care in poor urban areas have the potential to raise labor-force participation rates of mothers residing

[4] See Appendix 1 for a description of this program. The project, funded by USAID's Office of Women in Development, was a collaborative effort of IFPRI, the Guatemala First Lady's Social Works Program of *Hogares Comunitarios*, and the Institute of Nutrition of Central America and Panama/Pan American Health Organization (INCAP/PAHO). The overall objective of this study was to identify constraints to the implementation and impact of the *Hogares Comunitarios* government-sponsored day care program, provide recommendations for improving the program, and design specific activities to strengthen particular components of the program. The project included three specific phases: (1) a qualitative and operational research evaluation phase, which was carried out by IFPRI between February and July 1998; (2) a technical assistance phase provided by INCAP to the *Hogares Comunitarios* Program, initiated in February 1998; and (3) an impact evaluation phase executed by IFPRI.

in such neighborhoods, but not necessarily their earnings, conditional upon their having entered the labor force.

2. Conceptual Model of Work and Childcare Choice

Theoretical Model

To underpin the discussion, we present a brief model of women's labor supply and childcare choice. Suppose the decisionmaker is the woman choosing whether to work and what form of childcare she will use. Her household's utility function can be characterized as

$$U = U(X_p, X_h, L) , \tag{1}$$

where X_p refers to market-purchased goods, X_h refers to "home-produced" goods such as child health and nutrition, and L is leisure. Now suppose that home-produced goods can be produced using either household labor supply, t_h, or substitutes such as childcare services, t_c. That is,

$$X_h = f(t_h, t_c) . \tag{2}$$

Suppose the household receives income from wage labor and from asset earnings. For the sake of simplicity, assume the income of the woman's husband, Y_h, is exogenous to her own decision to enter the labor force. Let us assume, like Gustafsson and Stafford (1992), that an hour of woman's market time requires the substitution of childcare services for her own time at the price p_c. Thus, the net return to a woman's time on the labor market is given by $(w - p_c)$. The household's income constraint can then be written as

$$p_a \cdot A + (w - p_c) \cdot t_w + Y_h = pX_p , \tag{3}$$

where $p_a \cdot A$ is the value of asset earnings or unearned income, $(w - p_c) \cdot t_w$ is income from wage labor net of childcare costs, where w is the market wage rate, t_w is time spent in the labor market, p_c is the price of a unit of childcare, and Y_h is the husband's income. Household income is spent on purchases of the market-produced good, X_p.[5]

The time of individuals in the household is allocated to time in the labor market, time producing home goods, and leisure. Thus, the household time constraint is as follows:

$$T = t_w + t_h + L \ . \tag{4}$$

Incorporating the household time constraint into the income constraint, the full income constraint can be written as

$$pX_p + w \cdot L = wT + (p_h X_h - w \cdot t_h - p_c t_c) + p_a \cdot A + Y_h \ . \tag{5}$$

That is, total consumption, including the value of time spent in leisure, cannot exceed full income. Full income is the value of time available to all household members, "profits" from "home" production (less childcare costs), nonlabor income, and husband's income. Maximizing (1) subject to the full income constraint yields reduced form demand functions for goods $\boldsymbol{x}$, and leisure L, which can be written as a function of prices, wages, unearned income, given the household's asset levels, A, and husband's income, Y_h:

$$\boldsymbol{x} = \boldsymbol{x}\,(\boldsymbol{p}, \boldsymbol{w}; A, Y_h) \ , \tag{6}$$

$$L = l(\boldsymbol{p}, \boldsymbol{w}; A, Y_h) \ . \tag{7}$$

[5] Alternatively, one could include childcare as a component of the bundle of goods and services that the household consumes, but it is easier to treat it as a "cost" of participating in the labor force.

Since leisure is a normal good, we expect that leisure increases with wages (due to an income effect), asset earnings, and husband's income. Conversely, the woman's time supplied to the labor market,

$$t_w = T - t_h - L = l'(\boldsymbol{p}, \boldsymbol{w}; A, Y_h) , \tag{8}$$

would increase with own wages, and decrease with asset holdings and husband's income. However, recall that the net return to a woman's time in the labor market is not the market wage but $w - t_c$. So, we expect that while a woman's time on the labor market will increase with w, it will decrease with childcare costs, t_c.

Demand for Childcare Services

The above exposition obviously simplifies the many dimensions of the demand for childcare by working mothers by assuming that there is a one-for-one match between work time and childcare time. However, there are several sets of factors that influence the demand for various types of childcare arrangements. These include the need for mother substitutes for care, whether her work is in her home or at a remote location, and the number and ages of her preschool children. The availability, price, and quality of various mother care substitutes will influence her choice. Conditional on her being in the labor force, a higher wage, greater household income, and work hours should each increase demand for all forms of nonparental childcare through positive income effects. Mother's earning potential is expected to raise demand for day-care services because it increases the opportunity cost of her leisure time. Demand for higher quality, more reliable services is expected to respond positively to household income and maternal education. Ethnicity and family background variables may capture differences in cultural preferences and attitudes regarding acceptable forms of childcare.

Much of the literature on the demand for day care is from more-developed countries (Johansen, Leibowitz, and Waite 1996; Hotz and Kilburn 1995; Waite, Leibowitz, and Witsberger 1991; Johansen 1990; Leibowitz, Waite, and Witsberger

1988; Lehrer 1989; Robins and Spiegelmen 1978); however, some results are available for low-income countries (Lokshin 2000; Lokshin, Glinskaya, and Garcia 2000; Deutsch 1998; Connelly, DeGraff, and Levison 1996).

Day care choice is often modeled as a multidimensional outcome variable by type or location of care. Not surprisingly, higher own-price lowers the probability of that particular type of care being used (Lokshin 2000; Lokshin, Glinskaya, and Garcia 2000; among others). Greater household income increases demand for formal, center-based—as opposed to informal, home-based—services (Hofferth and Wissoker 1992). Mother education has a similar effect, most likely because center-based care is perceived to have stronger educational components than care in private home settings (Leibowitz, Waite, and Witsberger 1988). Evidence on the effect of quality of care on demand is lacking because of the dearth of information on characteristics of care settings and caregivers. If quality is included in the model, it is either not modeled directly (Michalopoulos, Robins, Garfinkel 1992), or it may be represented by proxy measures such as child-provider ratios (Hofferth and Wissoker 1992). Child age has been shown to be an important determinant of type of arrangement used; the demand for nonrelative and center-based formal care increases during the child's second year of life, while informal relative and home-based care is preferred for infants (Leibowitz, Klerman, and Waite 1992; Leibowitz, Waite, and Witsberger 1988). The presence of alternative caregivers in the home has been shown to reduce the demand for formal childcare services. A study from urban Brazil (Deutsch 1998) shows, in fact, that the presence of older children and adults in the household is the only significant determinant of demand for formal care, and it reduces it. Another analysis of demand for childcare in urban Brazil, using a different data source, indicates that females age 10 and over in the household are a major source of day care; males in the household, however, are not (Connelly, DeGraff, and Levison 1996).

Impact of Childcare Availability on Mother's Labor Force Behavior

A mother's decision to work will be influenced by her earning potential, her own characteristics, and those of her household. The presence of young children imposes a

constraint to her work because they require care at all times. Therefore, the price and availability of childcare is expected to affect her decision. Moreover, if it is the case that mother's preferences for work are related in unobservable ways to her preferences for childcare, then the choice of her work status could be simultaneous with her childcare decision. For example, it could be that certain mothers may have stronger preferences for child health and education investments than others. Such factors influencing childcare preference may also affect her decision to enter the labor force. In other words, the menu of possible childcare arrangements could affect her entry into the labor force; if certain mothers work only when the "right" type of childcare is available, then factors affecting selection into work could also influence choices for care. We will address this possible source of selection bias by employing an estimation approach that allows for the labor-force entry and childcare decisions to be related, as described below.[6]

Numerous investigations of maternal labor market behavior have considered the effect that young children have on work. Only relatively recently, however, has childcare availability and cost been explicitly considered in such models. In developing countries, care availability is often measured by the presence of other individuals in the household who can potentially act as a substitute for the mother's care. The evidence consistently shows that the presence of other females in the household increases the probability of a mother's work (Deutsch 1998; Connelly, DeGraff, and Levison 1996; Tiefenthaler 1997; Wong and Levine 1992; Pitt and Rosenzweig 1990). There are usually no direct costs associated with this form of care, and the opportunity cost of provision of care by these individuals is normally not incorporated in the analysis. One important difference between poor and rich countries is the age of these potential care providers; in developing countries girls as young as age 6 have been shown to increase mother's work when there are younger children in the home that need care; whereas, in more developed countries,

[6] Ribar (1992) and Connelly, DeGraff, and Levison (1996) have attempted to address this issue by estimating childcare and labor supply decisions jointly. Each uses a recursive approach: determinants of labor-force entry are estimated; then estimated coefficients from this equation are used to correct for sample selection in the childcare demand equation. Connelly et al. (1996) estimate a similar model but take on the additional challenge of treating recent births as endogenous.

this effect is usually observed with the presence of other adult females in the home, often a grandmother of the child.

The effect of costs of nonrelative day care on maternal labor supply has been examined by several studies of women in industrial countries. Availability of formal childcare centers, as measured by regional dummies to capture geographical density, has been found to positively affect mother's participation in the work force in the United States (Leibowitz, Waite, and Witsberger 1988). Childcare tax credits have a similar effect on labor market reentry for mothers of very young children (Leibowitz, Klerman, and Waite 1992). Ribar (1992) finds large negative effects of market childcare costs on married women's employment status; Michalopolous, Robins, and Garfinkel (1992), however, find only very small positive responses in hours worked to a childcare subsidy among both married and single mothers. Gustafsson and Stafford (1992) find that married women's labor supply increases in response to subsidies for high-quality childcare services only.[7] Gelbach (2002) finds that access to free "childcare" (defined as eligibility for school enrollment among five-year-olds) has a positive and significant influence on single mothers' labor-force participation and hours worked.

Evidence from low-income countries is provided by Lokshin (2000), Lokshin, Glinskaya, and Garcia (2000), and Deutsch (1998).[8] The first two studies find that mother's labor-force participation and work hours in Russia and Kenya, respectively, decrease in response to childcare costs. Deutsch finds no significant effect of

[7] This may indicate that there are factors common to mother's work and childcare preferences, as mentioned in our childcare demand discussion.

[8] The small number of studies is most likely driven by the fact that formal childcare is only beginning to become available in developing countries. Furthermore, for services that are available, there is still a lack of data on utilization and characteristics.

community-level day-care costs on mother's labor supply and work hours in urban Brazil.[9]

Impact of Childcare Availability and Choice on Mother's Earnings

Earnings are determined by wages and labor hours. Childcare choices made by mothers can affect not only whether they work, but also the type of work they engage in and the amount of time they spend in paid work. Access to reliable day care may enable mothers to participate in types of work that are not compatible with simultaneously caring for their children, such as jobs in manufacturing and industrial settings, which are often higher-paying than traditional forms of employment for poor urban women. Greater availability of childcare may therefore influence a mother's wage by expanding the types of jobs she can apply for and maintain. It could also potentially increase the number of hours she spends working; higher care prices may reduce labor hours by increasing the opportunity cost of working.

Controlling for mother's choices to work and to use formal day care, we examine the impact of childcare price on earnings. We are aware of only one other study that examines the effect of women's work and childcare choices on earnings in a developing country setting. For poor urban Brazilian women, Deutsch (1998) models the influence of labor-force participation on earnings, then separately models the influence of childcare decisions on earnings. The *simultaneous* influences of *both* decisions are not modeled

[9] As described below, price is defined here as the community median expenditure per hour of care used for each care type. A discussion of issues related to determining the price of childcare can be found in Gelbach (2002). Various sources have been used: expenditure per hour of care, expenditure per mother hour worked, wages for childcare workers, average cost for care in the state or community, among others (Gelbach 2002; Averett, Peters, and Waldman 1997; Barrow 1996; Meara 1996; Berger and Black 1992; Blau and Robins 1988). The use of own expenditure as price is problematic because it is endogenous and does not accurately reflect the menu of available "prices" because of selection bias due to only certain types of individuals actually purchasing each type of care. It could also be influenced by differences in quality of care, which are often unmeasured and therefore not controlled for. One approach has been to attempt to estimate a predicted childcare price to use in the childcare demand equation. This approach is fraught with difficulties, however, mainly do to the need to exclude variables from the labor supply equation to use as instruments for childcare expenditure, even when these variables are unlikely to be good instruments for childcare expenditure, and they can often be expected to directly affect labor supply itself. The use of community-level median prices avoids most of these problems.

because of a lack of separate instrumental variables for labor-force entry and for childcare choice: the same variables are used to estimate both selection equations separately. In both versions of the earnings equation, hours are assumed to be exogenous and underlying reduced-form determinants of wages are used (instead of predicted wages).[10]

Given the general difficulties of estimating an earnings equation even without the *double* control for selection into the labor force and into type of childcare, we experiment with two approaches to estimate maternal earnings. We will first use a "quasi-reduced form" equation; here the reduced-form determinants of wage and hours will be included along with a selection term for entry into the labor force and the predicted probability of using formal day care. We will then employ an intermediate strategy by estimating the two components of earnings separately. Hours and wage equations will be estimated separately, controlling for the two selection factors each time. This is intended to lend insights into the pathways through which childcare prices influence maternal earnings; if the influence is through wages, mothers may have greater earning potential without having to sacrifice more time (leisure and other types).

3. Data and Empirical Specification

Sampling Methodology

The study was carried out in Guatemala City and included all households located in Mixco, one of the three urban zones where the *Hogares Comunitarios* program was operating in 1999 (the zones included Mixco, Zone 18, and Villa Nueva). Mixco was selected for the study for several reasons: the area was entirely urban; the operations evaluation results (Ruel et al. 2002) did not reveal any significant differences in the acceptability of the program, quality of services offered, children's duration in the

[10] In estimating an earnings equation for Guatemalan women, Arends (1992) controls for selection into the labor force (but not choice of childcare), and treats hours as exogenous and uses reduced-form determinants of the wage.

program, and other operational aspects; and this zone had the fewest security problems likely to endanger the field study team.

A random sample was drawn from households having resident children ages 0 to 7 years. The outcome variable of interest for calculating the sample size for the random sample was women's labor-force participation. Using information from the 1995 Guatemala Demographic and Health Survey, we found that a difference of 25 percent would be a reasonable assumption for the effect that the program could have on motivating women to enter the labor force. Twenty-five percent is the magnitude of the difference between the labor-force participation of poorly educated women who have children ages 0 to 6 years and similarly educated women who do not have preschool children. For this magnitude of difference, a sample of 1,266 households was needed; the actual sample size is 1,363 households.

As described in Appendix 2, the household survey collected data on childcare arrangements, mother's work, household demographic and socioeconomic characteristics, family background and social networks of the mother, and nutritional status of mother and children. The data, questionnaires, and description of the study are available upon request from IFPRI (www.ifpri.org).

Joint Estimation of Maternal Use of Formal Childcare and Entry into the Labor Force

The above discussion suggests that the decisions to enter the labor force and to use formal childcare (as opposed to informal care or care by the mother herself) are interrelated. One approach would have been to model the childcare decision as conditional on the woman's labor-force participation, using a probit model with selectivity. The approach we use better reflects the actual decisionmaking process by estimating both choices jointly using a bivariate probit model. That is, we assume that the underlying model is given by

$$
\begin{aligned}
&y_1'^* = \beta'_1 x_1 + \varepsilon_1, \qquad && y_1 = 1 \text{ if } y_1^* > 0,\ 0 \text{ otherwise,}\\
&y_2'^* = \beta'_2 x_2 + \varepsilon_2, \qquad && y_2 = 1 \text{ if } y_2^* > 0,\ 0 \text{ otherwise,}\\
&E[\varepsilon_1] = E[\varepsilon_2] = 0,\\
&\mathrm{Var}[\varepsilon_1] = \mathrm{Var}[\varepsilon_2] = 1,\\
&\mathrm{Cov}[\varepsilon_1, \varepsilon_2] = \rho. \qquad && (9)
\end{aligned}
$$

Labor-force participation, y_1, is also modeled as a binary variable. It is a function of a vector of exogenous variables, $\mathbf{x}_1$, which include the mother's personal characteristics such as education, age, age squared, and ethnicity, all of which are also likely to influence her wage; the household's age and sex composition, which would capture the need for childcare, the presence of other potential income earners,[11] and the availability of substitutes for mother's time in childcare[12]; availability and price of formal care; availability and price of informal care; value of household productive assets (those that can be used to earn income in a poor urban neighborhood); and instrumental variables for labor-force participation, including the value of assets that the woman brought to her marriage (or union), as an indicator of her status or "bargaining power" within the household, family background variables that may have shaped her labor-force behavior during adolescence and early adulthood (composition of her natal household and her mother's work behavior when this woman was a child), and local labor market opportunities (community median of the female wage and the proportion of mothers working).

Choice of formal care, y_2, is a latent variable that takes on the observed values 0 and 1, and is a function of a vector of exogenous variables $\mathbf{x}_2$, which include the mother's own characteristics (education, age, age squared, and ethnicity), the need for childcare (number of preschoolers in the household and the age of the youngest child); availability

[11] The age disaggregations are based on differences by age in the need for and ability to provide childcare, the timing of potential school entry for children in urban Guatemala, and life-cycle earnings opportunities for adults.

[12] We did not include a dummy variable for the woman's marital status (or household headship) because household "headedness" (e.g., who is earning) is co-determined with her work decision, and hence should not be included in the regressions.

and price of formal care; availability and price of informal care; the value of household productive assets; and instrumental variables for formal care choice, including family background variables such as whether her mother used nonfamily or formal day care when the woman was a child. Availability and price of formal care are assumed to be exogenous and are captured by a number of variables: the community median price of formal care, the distance from home to formal care, and the distance from work to formal care. The distance variables are an attempt to account for the time costs due to travel time to the childcare facility. Similarly, the price of informal care includes variables that capture both monetary and time costs—the community median price of informal care and travel time from home to the caregiver and from caregiver to work. The number of nonpreschoolers in various age and sex categories, particularly adult females, is an indicator of the availability of informal care.

The test that both equations are interdependent is equivalent to testing whether the null hypothesis of $\rho = 0$ can be rejected.

In the alternative specification,[13] we examine the joint and perhaps interrelated decisions of using formal childcare and number of hours worked, including zero hours. Here use of formal day care, y_2, is still a latent variable taking the observed values 0 and 1, but now y_1 is hours worked and is modeled as a continuous variable, taking both zero and positive values, and potentially affected by y_2. That is

$$y_1' = \beta'_1 x_1 + \delta y_2 + \varepsilon_1,$$

$$y_2'^* = \beta'_2 x_2 + \varepsilon_2, \qquad y_2 = 1 \text{ if } y_2^* > 0, \text{ 0 otherwise,} \tag{10}$$

where ε_1 and ε_2 are bivariate normal with mean zero and covariance matrix

$$\begin{bmatrix} \sigma & \rho \\ \rho & 1 \end{bmatrix}.$$

[13] Examining the joint outcomes of using formal day care and mother work hours was suggested by an earlier reviewer.

The test that the equations are interdependent is again equivalent to testing whether the null hypothesis of $\rho = 0$ can be rejected.

Impact of Childcare Availability and Choice on Maternal Earnings

As laid out in the conceptual model, earnings are composed of two parts: hours worked and wages. Wage, hours, and earnings equations are estimated that include a selectivity correction for participation in the labor force and the predicted probability of choosing formal childcare, mother's characteristics, household socioeconomic status, price of formal and informal care, and household size and demographic composition. Household size and demographic variables are included in the three regressions since it is possible that they influence the number of hours worked, even after conditioning on the choice to work.

4. Results

Demographic, Labor Force, and Socioeconomic Characteristics of Mothers

Characteristics of mothers in the sample (all mothers, working mothers, and nonworking mothers) are presented in Table 1. Thirty-seven percent of mothers worked for pay in the month before the survey. A number of significant differences are observed between working and nonworking mothers. On average, working mothers are nearly three years older and are more likely to be indigenous (defined as speaking a Mayan language or customarily wearing indigenous clothing). Their civil status also differs: those working are more likely to be single, separated, divorced, or widowed instead of married or in a consensual union. Working mothers are also more likely to reside in single nuclear households that are smaller and are less likely to have a male household head. Each of these factors is likely to be associated with less socioeconomic security and a greater need for wage employment among current household members.

Table 1 Characteristics of mothers with preschoolers: All mothers, working mothers, and nonworking mothers

	All mothers		Working mothers		Nonworking mothers		Difference test: Working = Non-working
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
Mother characteristics							
Age (years)	28.77	7.90	30.50	7.64	27.75	7.88	0.00
Years of schooling	5.85	3.71	5.97	3.90	5.78	3.59	0.37
Literate (yes/no)	0.89	0.31	0.88	0.32	0.90	0.30	0.22
Indigenous	0.10	0.30	0.13	0.34	0.08	0.28	0.01
Single	0.06	0.23	0.09	0.29	0.03	0.18	0.00
Married or cohabiting	0.83	0.37	0.70	0.46	0.91	0.29	0.00
Separated, divorced, widow	0.11	0.31	0.21	0.40	0.06	0.23	0.00
Household headship							
Male head present	0.83	0.38	0.70	0.46	0.91	0.29	0.00
Household structure							
Nuclear	0.32	0.47	0.37	0.48	0.29	0.46	0.01
Compound, relatives	0.37	0.48	0.34	0.48	0.39	0.49	0.11
Compound, nonrelatives	0.24	0.43	0.23	0.42	0.25	0.43	0.35
Compound, mixed	0.37	0.48	0.34	0.48	0.39	0.49	0.11
Household structure and alternate caretakers							
Household size	5.16	2.13	5.34	2.26	5.06	2.04	0.02
Number preschoolers	1.60	0.74	1.51	0.69	1.66	0.77	0.00
Age youngest child (yrs)	2.04	1.80	2.43	1.84	1.81	1.74	0.00
Number of females > 7 years	1.88	1.28	2.13	1.43	1.72	1.15	0.00
Number of males > 7 years	1.62	1.06	1.65	1.17	1.61	0.99	0.50
Number of sisters > 15 years	2.24	2.93	2.22	1.67	2.26	3.47	0.81
Woman's mother alive	0.82	0.39	0.80	0.40	0.82	0.38	0.27
Woman's mother resides with her	0.23	0.42	0.28	0.45	0.21	0.41	0.03
Her mother resides in capital city	0.29	0.45	0.27	0.44	0.30	0.46	0.14
Employment status/childcare							
Worked for pay in last month	0.37	0.48	1.00	0.00	0.00	0.00	0.00
Years potential experience	13.12	8.82	14.08	9.37	12.45	8.36	0.00
Received formal training	0.31	0.46	0.35	0.48	0.29	0.45	0.01
Child in *hogar comunitario*	0.01	0.10	0.03	0.17	0.00	0.00	0.00
Asset position							
Value Per capita	9,098.3	14,813.5	8,157.9	10,577.2	9,651.8	16,796.6	0.07
Value household total	41,757.6	60,576.9	39,164.1	48,713.7	43,284.1	66,558.5	0.23
Value household productive type	4,458.2	9,989.9	3,788.8	8,062.1	4,852.2	10,952.7	0.06
Value household nonproductive type	37,299.4	56,083.1	35,375.2	45,950.9	38,431.9	61,265.9	0.33
Number of observations	1,363		505		858		

Working mothers have fewer resident preschoolers, and the preschoolers they have are older. This is consistent with evidence cited above regarding child age and maternal reentry into the labor force after a child's birth. In households with working mothers, there are a larger number of other females who may act as substitute child-

caregivers, similar to the findings of Connelly, DeGraff, and Levison (1996) and Connelly et al. (1996).

Asset positions also vary between the households that have mothers who work and those that do not. Households with working mothers have lower per capita asset values. They also have fewer assets that can be classified as productive (i.e., can be used to earn income), implying that wage labor is most likely a very important livelihood strategy for these households.

Employment, Jobs, and Remuneration of Working Mothers

Primary employment situations of working mothers are presented in Table 2. Half the mothers have salaried positions; around 40 percent are self-employed; and the remainder work for a daily-wage or on a piece-rate basis. Total employment hours worked in the month preceding the survey average 153. In the table, hours are converted to standardized eight-hour days for ease of comparison of wages among employment types. Standardized days worked per month average around 19; however, mothers in daily-wage/piece-rate jobs work fewer hours.

Table 2 Type of employment and earnings: Working mothers only (n = 502)

	Percent	Hours past month	Standardized (8-hour) days worked in past month	Earnings past month	Earnings per 8-hour day
	(%)			(1999 quetzals)	(1999 quetzals)
Salaried work/private enterprise	50.60	150.00	18.75	765.83	41.27
Salaried work/government	3.19	164.16	20.52	1,101.94	57.37
Daily wage/piece-rate	7.97	122.16	15.27	442.62	31.72
Self-employed	37.85	163.68	20.46	479.86	30.37
Unpaid work	0.20	160.00	20.00	0.00	0.00
Mean		153.12	19.14	640.03	37.45

Earnings per standardized eight-hour workday (our wage measure) are low for the daily-wage/piece-rate group and for the self-employed. Earnings for a standardized day are highest for mothers in salaried-government jobs; however, only 3 percent of the working sample mothers are in this type of employment. Mothers in salaried-private

enterprise jobs—about half of the sample mothers who work—have daily and monthly earnings well above the sample mean.

Job type data, shown in Table 3, reveal that a large percentage of mothers work in service-sector positions: one-quarter work as domestics, one-quarter as itinerant vendors, 8 percent as police or soldiers, and another 13 percent as either childcare, clerical, or education workers. Twenty-nine percent of mothers work in a factory, a small business, or as artisans. The number of standardized days worked in the previous month does not vary greatly among the more prevalent job types: the mean is 19 eight-hour days per month. Highest paying jobs per standardized day (and per month since hours do not vary greatly across job type) are clerical worker and police/soldier, and the lowest paying is taking care of children (although this job is likely to be associated with having a more flexible schedule).

Table 3 Type of job: Working mothers only (n = 502)

	Percent	Number of 8-hour days past month	Earnings past month	Earnings per 8-hour day
	(%)	(1999 quetzals)	(1999 quetzals)	(1999 quetzals)
Taking care of children	2.59	23.15	430.77	19.27
Nonagricultural labor	0.20	12.00	480.00	40.00
Domestic work	23.51	18.55	484.43	32.69
Itinerant vendor	26.49	18.70	519.78	37.59
Artisan	6.97	19.11	549.57	29.01
Factory/small business worker	22.11	20.09	738.22	37.59
Police/soldier, etc.	6.37	18.48	686.66	51.27
Clerical work	8.37	20.02	1,367.98	59.81
Teacher	1.99	18.50	541.30	29.58
Mean		19.14	640.03	37.45

Day Care Arrangements for Working Mothers

Table 4 displays the childcare arrangements of working mothers; there are seven major types. These include public formal day care (the *Hogares Comunitarios* facilities) (3 percent of total), private formal day care (22 percent), care of the child by the mother herself while working (42 percent), a resident household member who is not the mother (29 percent), a nonhousehold resident relative (14 percent), a neighbor or other

nonrelative (14 percent), and the child being left alone (2 percent). In the models estimated here, the first two categories comprise formal care, and the other five comprise informal care. Childcare supply is assumed exogenous. A full one-quarter of working mothers use more than one type of day-care arrangement during the Monday–Friday work period. Price per hour of childcare (cash plus the value of in-kind payments) is lowest when the child is cared for by the mother while working, and when the child is left alone. Aside from these two categories, the *Hogares Comunitarios* public day care is the lowest priced alternative. The most expensive type of care is that by a neighbor or other

Table 4 Childcare arrangements for working mothers

	Formal childcare		Informal childcare				
	Public formal day care (*Hogar Comunitario)*	**Private formal day care**	**Mother herself**	**Other resident household member**	**Non-resident relative**	**Neighbor/ other**	**Child left alone**
Percentage of working mothers who use this type[a]	3	22	42	29	21	7	2
Number of different care types used by mothers who use this type	1.36	1.97	1.31	1.44	1.50	1.54	1.82
Price per hour of care[b]	0.23	0.85	0.00	0.36	0.70	1.02	0.00
Hours of care per child per day[c]	10.95	4.59	8.77	9.11	8.55	9.58	9.96
Typical monthly per child expense for this type of care[d]	54.58	84.55	0.00	71.07	129.69	211.75	0.00

[a] Sum of percentages exceeds 100 because one-quarter of working mothers use more than one type of care.
[b] Equals cash payments plus the value of in-kind payments.
[c] A small proportion of women with rotating or irregular schedules does not report care hours per day and are excluded from this statistics. If the mother watches the child while working or the child is left alone, childcare hours are set equal to mother's work hours. If the same type of care is used twice in a single day, care hours are summed for that day.
[d] Based on a five-day day-care week at mean price and hours. [Typical monthly per child expense = (mean care hours per day) · (mean price per hour) · (21.67 weekdays days per month)].

unrelated individual. Hours of care per child per day are greatest for children in public formal day care.[14]

Determinants of Labor Force Participation and Formal Childcare Utilization

Table 5 presents the regression results from a bivariate probit model of a mother's joint decision to use formal childcare and to work and an endogenous treatment effects model of a mother's joint decision to use formal childcare and the number of hours she works. The dependent variables in the bivariate probit are a binary variable for the use of formal day care (versus informal day care or care by the mother herself) and a binary variable for working for pay in the last 30 days (versus not working for pay). In the treatment effects model, the dependent variables are a binary variable for the use of formal day care and a continuous variable for hours worked (including zero hours).[15]

In the bivariate probit model, we reject the null hypothesis that the decisions to use formal childcare and to enter the labor force are independent (the Wald test shows that ρ significantly differs from zero).

A woman's education and age positively and significantly affect her choice of formal day care. Use of formal care also increases with the number of children she has between ages 3 and 7; this is the age group that is usually accepted by formal day-care providers and is, in fact, the target age group of the *Hogares Comunitarios* program. While none of the price variables is significant at 5 percent, time costs (which are part of

[14] With the low hourly price, the high number of service hours available per day (12), and the extremely high degree of parental satisfaction with the HC program found in the operations evaluation component (Ruel et al. 2002), it might seem surprising that more parents do not use the *Hogares Comunitarios* program. The low rates of utilization, however, stem from supply constraints: at the time of the survey in 1999, the HC program was still in a pilot phase and was focusing on improving the quality of care in the HCs before expanding the number available. It would appear that filling slots in future *Hogar Comunitarios* will not be a problem. (This is further reinforced by a finding in the operations evaluation that when a child drops out of an HC, the caregiver mother is normally able to fill the slot with another child within 24 hours [Ruel et al. 2002].)

[15] The trichotomous outcome of no work, formal work, or informal work was not modeled because it does not capture variations in two key outcomes of interest for the study: wages and hours. Furthermore, low wages nearly perfectly indicate that the job is in the informal sector.

Table 5 Joint determinants of use of formal day care and (a) labor-force participation and (b) hours worked

	Uses formal day care (bivariate probit; endogenous treatment)		Worked for pay last 30 days (bivariate probit)		Hours worked last 30 days (endogenous treatment regression)	
	Coefficient	**z**	**Coefficient**	**z**	**Coefficient**	**z**
Woman's personal characteristics						
Woman's educational attainment	0.06	**4.31**	0.02	1.54	-0.35	-0.33
Woman's age in years	0.09	**2.61**	0.20	**5.06**	8.65	**3.65**
Woman's age squared	0.00	**-2.15**	0.00	**-4.54**	-0.11	**-3.40**
Years lived in capital city	0.01	1.34	0.00	-0.97	-0.51	-1.38
Woman is Indigenous	-0.02	-0.10	0.41	**3.19**	25.83	**2.46**
Household characteristics						
Log household size	-0.30	-0.62	-0.36	-0.83	-17.84	-0.59
Number of Males age 0–2 yrs in household	0.03	0.23	-0.11	-0.88	-10.47	-1.28
Number of Females age 0–2 yrs in household	-0.07	-0.49	-0.30	**-2.23**	-14.76	-1.76
Number of Males age 3–6 yrs in household	0.71	**5.62**	-0.04	-0.39	-7.54	-0.86
Number of Females age 3–6 yrs in household	0.73	**5.93**	0.04	0.34	-1.97	-0.22
Number of Males age 7–14 yrs in household	0.05	0.42	0.07	0.70	2.96	0.40
Number of Females age 7–14 yrs in household	-0.07	-0.64	0.17	1.73	6.70	0.95
Number of Males age 15–18 in household	-0.01	-0.04	0.17	1.28	3.52	0.36
Number of Females age 15–18 in household	-0.16	-1.12	0.26	**2.10**	14.02	1.51
Number of Males age 19–29 yrs in household	-0.05	-0.36	-0.29	**-2.33**	-22.80	**-2.75**
Number of Females age 19–29 yrs in household	-0.08	-0.79	0.16	1.79	3.21	0.49
Number of Males age 30–44 yrs in household	0.06	0.39	-0.22	-1.52	-30.42	**-3.08**
Number of Males age 45–64 yrs in household	-0.16	-0.88	-0.29	-1.66	-22.44	-1.78
Number of Females age 45–64 yrs in household	-0.02	-0.12	0.59	**3.66**	36.27	**3.06**
Number of Males age 65 yrs and older in household	0.02	0.08	0.05	0.20	-7.68	-0.38
Number of Females age 65 yrs and older in household	0.08	0.29	0.20	0.77	24.71	1.22
Value of productive assets	0.00	-0.54	0.00	**-2.81**	0.00	-1.60
Community characteristics						
Comm. median price per hour formal care	1.11	1.70				
Comm. median price per hour informal	0.92	1.76	0.31	0.55	32.43	0.75
Comm. median time care to work for formal care	0.01	0.50	0.00	0.20	-0.19	-0.17
Comm. median time care to work for informal care	0.00	0.37	0.00	-0.32	0.27	0.34
Comm. median time home to care for formal care	-0.04	**-2.47**	0.02	1.13	1.26	0.34
Number of formal preschools in community	-0.01	-0.21				
Comm. median female earning per hour			-0.07	-0.32	-4.34	-0.25
Comm. Proportion of working mothers			4.07	1.86	409.32	1.81
Family background variables						
Nonrelative care used by woman's mother	0.15	0.58				
Value of woman's pre-union assets			0.00	**2.41**	0.00	-0.06
Woman was only female in her household as a teenager			-0.04	-0.39	-1.45	-0.19
Only mother lived at home when teenager			0.17	0.95	13.58	0.95
Woman was eldest child at home when teenager			0.06	0.66	2.56	0.35
Mother of woman worked for pay when she was a child			0.11	1.43	6.30	0.99
Predicted use of formal day care					2.79	0.11
Constant	-3.72	**-4.05**	-4.94	**-3.62**	-189.43	-1.55
Number of observations			1,271		1,274	
Log likelihood			-1,252.77		-8,276.2092	
Wald (chi-square)			341.11		92.01	
p-value			0.000		0.000	
Wald test of rho = 0			9.77791			
p-value			0.0018			
LR test of rho = 0					0.38	
p-value					0.5397	

Notes: Regressions with robust standard errors, z statistics in bold are significant at 5 percent or better.

the implicit price of day care) influence a woman's choice of formal care. The median time from her home to the provider for formal care has a negative impact on her choice of formal care.

We find that life cycle and demographic factors are important in a woman's decision to work, more so than her education. Age, age squared, and ethnicity are significant in the labor-force participation equation. Among household demographics (females age 30–45 is the excluded category), we find that female infants under 3 decrease the probability that a woman works. A woman is more likely to work if there are substitute female caregivers: females ages 7–15, 15–19, 19–30, and 45–65, with the largest and most significant effect coming from women between 45 and 65 years of age. Conversely, the presence of adult males slightly decreases a woman's probability of working for pay.

Wealth and a woman's own bargaining power are important determinants of labor-force participation. Women whose households have more productive assets are less likely to work outside the home, but a woman who brings more assets to her marriage is more likely to work. The bulk of asset values brought by women to their unions were a house and land. These no doubt reflect her stronger bargaining power with respect to the use of her own time.[16] This is the only family background variable that is significant in the labor-force participation decision.

In the treatment effects model, we cannot reject the null hypothesis that the decisions to use formal childcare and the number of hours to work (unconditional on entering the labor force) are independent. This suggests that use of formal childcare is related to a mother's decision to work but not to the number of hours worked once she has decided to work. Life cycle and demographic factors that affect labor-force entry

[16] Note that the value of women's premarital assets is not highly correlated with current household productive assets: the correlation is 0.2427 for all mothers; for working mothers, it is even lower, at 0.1823.

also influence unconditional hours worked. Household wealth and a woman's bargaining power do not, however, affect unconditional hours.[17]

Determinants of Earnings

Table 6 presents wage, hours, and earnings equations, estimated only on the sample of workingwomen, but with the labor-force selectivity correction and formal care probabilities estimated using coefficients from the bivariate probit regressions. Once selection into the labor force and formal care choice are accounted for, a woman's education and the presence of children ages 3 to 7 years in the household are the only significant determinants of wages. None of the determinants of hours worked are found to be statistically significant once we control for selection into the labor force and the predicted use of formal care. For earnings, the number of adult and elderly males in the household has negative impacts; the strong negative effect of adult males indicates that women may earn less in households where a male is the primary income earner. While the price of formal care has a negative effect, the coefficient is not significant. Thus it appears that use of formal care and the availability of formal care only affect the decision to work, and not wages, hours worked, or earnings conditional on the woman's participating in the labor force.

5. Conclusions

Reducing barriers to obtaining employment is crucial for helping lift women in poor urban neighborhoods of Guatemala out of poverty. Across Latin America, higher labor-force participation rates of women are associated with higher household incomes (Sedlacek, Gutierrez, and Mohindra 1993). Among the obstacles limiting the employment options of poor women is residence in households with high dependency

[17] The results for "use of formal care" in the treatment effects model are virtually identical to those in the bivariate probit model; therefore, only those from the bivariate probit are presented here.

Table 6 Determinants of wages, hours worked, and earnings (OLS with robust standard errors)

	Wage per hour		Hours worked		Earnings	
	Coefficient	**t**	**Coefficient**	**t**	**Coefficient**	**t**
Woman's personal characteristics						
Woman's educational attainment	0.45	**2.11**	-3.10	-1.11	18.80	1.63
Woman's age in years	0.27	0.32	-12.37	-1.13	41.23	0.95
Woman's age squared	0.00	-0.24	0.17	1.10	-0.58	-1.00
Woman is indigenous	-0.47	-0.29	-2.09	-0.08	38.81	0.44
Household characteristics						
Log household size	-3.24	-0.69	63.88	1.03	115.67	0.50
Number of males age 0–2 years in household	0.11	0.11	-6.31	-0.40	-30.40	-0.47
Number of females age 0–2 years in household	1.68	1.01	0.14	0.01	-90.42	-1.05
Number of males age 3–6 years in household	3.53	**2.11**	-16.81	-0.71	-29.08	-0.39
Number of females age 3–6 years in household	4.76	**1.99**	-25.99	-0.97	-48.69	-0.57
Number of males age 7–14 years in household	0.64	0.66	-9.35	-0.59	-37.78	-0.72
Number of females age 7–14 years in household	0.09	0.07	-19.31	-1.14	-3.71	-0.06
Number of males age 15–18 years in household	2.13	1.09	-11.73	-0.52	-32.12	-0.49
Number of females age 15–18 years in household	1.19	0.76	-18.75	-0.82	2.42	0.03
Number of males age 19–29 years in household	-0.05	-0.03	-6.69	-0.35	-96.85	-1.23
Number of females age 19–29 years in household	-1.08	-0.86	-12.84	-0.84	-57.07	-0.98
Number of males age 30–44 years in household	0.76	0.67	-28.72	-1.51	-183.85	**-2.21**
Number of males age 45–64 years in household	-1.27	-0.65	-25.25	-0.96	-126.82	-1.00
Number of females age 45–64 years in household	-0.56	-0.27	-14.12	-0.42	91.14	0.64
Number of males age 65 years and older in household	0.70	0.48	-19.58	-0.49	-246.45	-1.67
Number of females age 65 years and older in household	0.63	0.42	-35.32	-1.21	128.35	0.72
Value of productive assets	4.44	0.82	-2.35	-0.05	-225.48	-1.32
Community characteristics						
Comm. Median Price/Hour Formal Care	0.21	0.07	-3.04	-0.05	-122.43	-0.76
Comm. Median Price/Hour Informal Care	0.00	1.16	0.00	-0.43	0.01	1.56
Predicted use of formal care	-11.51	-1.27	-7.35	-0.07	-56.42	-0.17
Selectivity correction	3.26	0.76	-44.38	-0.68	94.77	0.38
Constant	-5.31	-0.34	453.57	**2.08**	-93.96	-0.10
Number of observations	342		357		434	
F value	1.48		0.94		1.12	
Probability > F	0.0683		0.555		0.32	
R-squared	0.0781		0.0503		0.1136	

Note: t-statistics in bold indicate significance at 5 percent or better.

ratios that are often headed by women. Finding reliable and affordable childcare is a challenge for mothers residing in poor urban neighborhoods. Because many are migrants from rural areas, they may be far away from extended family and have less access to informal alternative caregivers. Over 40 percent of randomly sampled mothers working in poor neighborhoods of Guatemala City cared for their children themselves while they were working in paid jobs. Changes in the structure of urban production toward more manufacturing and industrial settings mean employment opportunities for women will

occur increasingly in settings that are not compatible with the care of children: market work and caring for one's children are becoming more separate activities that compete for a mother's time. This trend is expected to increase the demand for nonparental childcare in urban Guatemala. Lack of availability and high prices for childcare may decrease the earning potential of poor mothers.

This study investigates whether interventions to increase the availability and lower the price of childcare to poor working mothers increase their total earnings, conditional on their decision to work. Recognizing that mother's work status may depend on the availability of childcare, participation in the labor market, and use of formal day care are modeled as joint decisions. Our results indicate that these are in fact joint decisions for poor working mothers. Life cycle and household demographic factors have important effects on both decisions, while mother's education is an important determinant of utilization of formal day care. Higher household wealth reduces her chances of working; however, her status within the household (as proxied by the value of assets she brought to her marriage) increases the likelihood of her working. Higher time costs of using formal day care reduce utilization of formal care. Controlling for endogeneity of labor market participation and formal day care use, the price of formal day care has negative but insignificant impacts on mother earnings. This suggests that interventions to increase the availability and lower the time costs of formal day care in poor urban areas have the potential to raise labor-force participation rates of mothers residing in such neighborhoods, but not necessarily their earnings conditional upon their having entered the labor force.

Appendixes

Appendix 1: Description of the *Hogares Comunitarios* Government-Sponsored Day Care Program in Guatemala

The Community Day Care Centers Program of the Secretary of Social Works of the First Lady of the Republic of Guatemala *(Programa de Hogares Comunitarios de la Secretaria de Obras Sociales de la Esposa del Presidente de la Republica)* was created as part of a strategy to alleviate poverty and promote integrated child development among poor communities. The program was initiated in 1991 as a response to the deteriorating socioeconomic situation of the country, which was reflected in high rates of childhood malnutrition (the prevalence of stunting was as high as 50 percent nationally), and the scarcity of preschool education and early stimulation programs for children 3 to 6 years old. The program was launched as a pilot project that established 20 day-care centers in Guatemala City. The successful pilot project was followed by the expansion of the program to various municipalities within six departments of the country. By 1996, it was covering all 22 departments of the country. As of January 1998, the program had a total of 1,200 community day-care centers spread throughout the country, which attended approximately 10,000 children 0 to 7 years of age.

The official program documentation describes the community day-care centers, or *Hogares Comunitarios*, as a nontraditional alternative to ensure the care of children of working parents, in communities characterized by poverty and extreme poverty, and lack of access to alternative childcare. In these communities, a local woman is selected by a group of parents to become the *madre cuidadora*, or the caregiver mother. In her home she is responsible for caring for 10 children under age 7 from 6 am to 6 pm, Monday through Friday. During their hours in the *hogar,* the children receive affection and care, hygiene and security, and food consisting of breakfast, a morning snack, lunch, and an afternoon snack. In addition, psycho-pedagogical activities are to be offered by the *madre cuidadora* to stimulate child development and to "foment the formation of values and good personal hygiene habits."

In addition to providing initial training of the *madres cuidadora*s, the program gives initial furniture, cooking and feeding equipment, and supplies for 10 children to each *Hogar*. On a monthly basis, the program offers the equivalent of approximately $0.55/child/day to the program caregivers to purchase food for the children, $0.03/child/day for educational material, and $0.03/child/day for cooking fuel. Caregivers also receive an incentive of $3.33/child/month for their work. Parents of the children are expected to provide monthly supplies of sugar, *Incaparina* (weaning cereal mix), toothpaste, toilet paper, and hand soap; they are also expected to pay $5/month to the program caregiver for each participating child. Each day-care center receives monthly donations of food commodities from the World Food Programme (usually 44 pounds of maize, 1 gallon of cooking oil, and 13 pounds of black beans [or 6 cans of fish]).

The officially stated overall objective of the program is to implement a set of actions through community participation and institutional coordination to promote integrated human development of communities where the program is being executed, with emphasis on the care of children and women. The specific objectives are to

1. facilitate the integrated development of children under 7 years of age (children of working mothers), through community day-care centers that implement a psycho-pedagogical model that fosters the natural educational role of the family and the community, and
2. provide and promote community participation in the integrated development of all children, improving living conditions and enriching the quality of their social relationships through a project that supports the development of community organization.

The program is one of the few currently operating in urban Guatemala that targets women, and working mothers with children under age 7, in particular. Most programs in

the country having a gender component are located in rural former conflict zones of the country's long civil war. (See IFPRI 1998 for a short description of these programs.)

Although the *Hogares Comunitarios* program covers both urban and rural areas of all the departments of the country, in 1999 poor urban neighborhoods of Guatemala City hosted almost 25 percent of all the country's *Hogares*. The program was promoted in this area because it was recognized that many women there are single mothers or household heads who are under increased pressure to work outside the home in income-generating activities. Childcare alternatives are likely to be a major constraint to the employment opportunities of these women. The Community Daycare Centers Program of Guatemala was thus designed to respond to a perceived urgent need for more childcare alternatives in poor vulnerable areas.

Other Day Care Programs in Latin America

There are a number of child day-care programs in Latin America, many of which are structured along a similar home-based community model as the *Hogares Comunitarios* in Guatemala. They include the *Wawa Wasi* program in Peru; the *Hogares Comunitarios de Bienestar* in Columbia; the *Programa Integrado por Desarrollo Infantil* in Bolivia; and the *Programa de Cuidado Diario* in Venezuela. A description of each program and its characteristics is presented in IFPRI 1998.

Appendix 2: Modules and Data Collected for Random Sample (N = 1,363 households)

Data collection module	Type of information collected
1. Household roster	Identification, names, age (date of birth), gender, relation to household head, civil status, occupation (whether they work or not, go to school, etc.), schooling (years achieved), resident status (past month)
2. Mother's labor-force participation	
A) Mother's employment experience and training	Age started working for pay and training type received (if any)
B) Mother's current employment	How found job, how long in job Occupation, type/size of employer, sector, hours worked/schedule Earnings, wages, benefits How many days worked in the last month How many days work missed in last month and why Other employment (up to 3)
3. Childcare arrangements	
A) For everyone	**Current** childcare arrangements: date started with this arrangement; hours/schedule of use, compared to official schedule; price they pay; other arrangements during weekdays; time to travel to day care and to work; mother's trust of caregiver; reason for using this arrangement; personal acquaintance with caregiver before starting.
B) If not in the *Hogares Comunitarios* Program	Knowledge of program; desire to enter in such a program (hypothetically); whether on a waiting list; knows any *madre cuidadora* personally; whether has necessary papers for child to enter the program
4. Household assets	Asset ownership and values (physical and financial)
5. Family history and social networks	
A) Mother of respondent mother	Civil status, family situation, worked outside the home, used day-care alternatives
B) Respondent mother	Birth order, age left her family, age married or in union the first time
C) Migration	Where born, when migrated to city (if applicable), how long residing in Guatemala City, how long residing in this particular community
D) Social networks	Number of relatives in Guatemala City (gender and whether women relatives work outside the home), number of relatives in neighborhood, how relatives visited, who helps when help is needed
6. Child and mother anthropometric measurements	Weight and height
7. Household hygiene conditions	Observations of conditions; questions regarding availability of water, electricity, garbage collection, and other services

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