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ABSTRACT

Working Less to Take Care of Parents? Labor Market Effects of Family Long-Term Care in Four Latin American Countries¹

We use data from time-use surveys and the Mexican Health and Aging Study (MHAS) to analyze the relationship between family long-term care (LTC) and female labor supply in four Latin American countries. Time-use survey data from Chile, Colombia, Costa Rica and Mexico shows that: (i) women provide the vast majority of family LTC; (ii) consistently across countries, women who provide LTC are less likely to work, and those who do work less hours per week and have a double burden of work and LTC. Multivariate analysis of longitudinal MHAS data shows that, after accounting for both individual and time fixed effects, parents' need for LTC is associated with both a significant drop in the likelihood of working (by 2.42 percentage points) and a reduction in the number of hours worked among women ages 50–64 who remain employed (by 7.03%). This finding has important gender equality implications. Also, in a region that is aging faster than any other in the world, social trends make this family provision of LTC unsustainable, increasing the need for policy action.

JEL Classification: J14, J16, J18, J21, J22

Keywords: female labor supply, Long-Term Care (LTC), elderly care, care dependence, time-use surveys, Mexican Health and Aging Study (MHAS), Latin America, Chile, Colombia, Costa Rica, Mexico

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1. Introduction

In Latin America and the Caribbean, in 2015 there were about 8 million people older than 60 living in a situation of care dependence, i.e. experiencing difficulties in completing basic activities of daily living like dressing, bathing, or eating. This figure is estimated to grow to at least 27 million by 2050 (Aranco et al., 2018). Dependent persons rely on help from others, meaning they require long-term care (LTC) services.

With a few exceptions, the markets for LTC services in the region are unfortunately very limited, and only the most affluent can afford them. For example, only about 0.5% of older people live in a nursing homes or assisted living facilities, versus over 2% in Europe or the United States (Cafagna et al., 2019). In Mexico, less than 3% of those receiving LTC report paying for it (González-González et al., 2019). Also, public LTC services are practically nonexistent in most countries.

Due to gender stereotypes, family members who provide LTC services are typically female, which has important implications for gender equality. Women who carry the burden of caregiving are likely to end up with lower labor market participation, which implies lower income, lower pensions, and, most likely, less intra-household bargaining power. Even in countries with large formal LTC systems, the market value of informal care is significantly greater than expenditure on formal care services. In Latin America and the Caribbean, where formal service supply is negligible, it is even more important for any discussion on LTC to take into account the contributions from and opportunity costs borne by female family caregivers.

In this paper, we describe the relationship between family LTC and women's labor supply in four Latin American countries, and we estimate how the need to provide LTC for a parent affects the labor market participation of adult women in Mexico. Our contribution is novel for two reasons. This is the first paper to use data from four time-use surveys (from Chile, Colombia, Costa Rica and Mexico) to investigate the relationship between LTC and women's labor supply in the region. Also, it is the first to use longitudinal data from the Mexican Health and Aging Study (MHAS)² to estimate the effect of LTC on labor supply while accounting for individual and time fixed effects. These adjust for time-invariant unobserved individual characteristics (e.g., genetic characteristics that affect both parents and children's health) that may confound the relation of interest. We aim to contribute to the gender equality agenda in the region and to the debate on the transformation of social protection, which includes the implementation of systems of LTC services.

We find that women make up between 63% and 84% of long-term family (unpaid) caregivers and account for 72% to 88% of total hours of LTC provided by families. Descriptive analysis shows that the provision of LTC is correlated with lower labor supply (on both the extensive and intensive margins) and with a double burden of work (employment plus LTC). Multivariate analysis with Mexican data also suggests that need for LTC is associated with both a significant drop in the likelihood of working and a reduction in the number of hours worked among Mexican women ages 50–64 who remain employed.

² In Spanish, *Estudio Nacional de Salud y Envejecimiento* (ENASEM): http://www.enasem.org/Index_Esp.aspx.

The remainder of the paper is organized as follows. Section 2 reviews the existing literature on informal LTC and labor supply. Section 3 describes our data sources. Section 4 explains the estimation methodology. Section 5 presents descriptive statistics from time-use surveys, while Section 6 contains multivariate analysis results based on the MHAS data. The last section holds the conclusions and discusses certain policy implications.

2. Literature review

Time-use surveys were originally designed to measure and study unpaid work done within households and calculate the contribution of this unpaid household work to the economy (Aguirre, 2014). They have been instrumental in showing that most of the burden falls on women—particularly in the lowest income brackets—who postpone or abandon their professional development to take care of family members. Most analyses using time-use surveys were conducted without focusing on who received informal care, whether children, older persons, or people with disabilities. One notable exception is the study by Chari et al. (2015), which looks at the opportunity cost of informal eldercare in the United States. It shows that the total opportunity cost of eldercare amounts to US\$522 billion per year and estimates that the cost of replacing this care with paid care would be US\$221 billion for unskilled care and US\$642 billion for skilled care.

Most of the literature on the labor market effects of LTC is based on health and retirement surveys or household panel data and mainly focuses on Europe or the United States. Ettner (1995) authored one of the first papers looking at the impact of elderly care, rather than child care, on female labor supply. It shows, using instrumental variables, that co-residence with a disabled parent led to large reduction in hours worked due primarily to withdrawal from the labor market in the United States. More recent literature provides evidence of negative effects on participation in paid work (Bolin *et al.*, 2008; Crespo & Mira, 2010; Heitmueller, 2007; Ciccarelli & Van Soest, 2018), on the number of hours worked (Johnson & Lo Sasso, 2000; Van Houtven *et al.*, 2013; Ciccarelli & Van Soest, 2018), and on workers' hourly wages (Carmichael & Charles, 2003, Heitmueller & Inglis, 2007). Some studies find evidence of greater labor market effects for female caregivers (generally wives or daughters) than for men (Carmichael & Charles, 2003; Johnson & Lo Sasso, 2006; Ciccarelli & Van Soest, 2018), and that LTC increases the probability of early retirement (Van Houtven *et al.*, 2013).

Two studies based on the United States Health and Retirement Survey (HRS) are the most similar to ours (Johnson & Lo Sasso, 2006; Fahle & McGarry, 2017). The HRS is the original survey on which the MHAS is modeled. Johnson and Lo Sasso (2006) use a sample of women ages 57 to 67 with at least one living parent. They use data from the 1996 and 1998 waves of the HRS to estimate a full information maximum likelihood (FIML) model, which aims to control for endogeneity in the provision of care.³ The labor supply dependent variable is equal to the total number of hours worked during the last year, considering both primary and secondary jobs. The LTC treatment variable is dichotomous and equal to one if the person provided at least 200 hours

³ The instruments used to correct the potential endogeneity of the provision of LTC to parents include variables that measure the parents' caregiving needs (age and health status), the availability of alternative sources of care for the parent (e.g., the number of adult brothers and sisters of the daughter, parental marital status), and an indicator for parental home ownership, which may be a proxy for parental wealth and the ability to purchase formal care.

of help with chores and errands to parents during the previous 24 months. The authors do not use the number of hours of care (a continuous variable built from a different question) due to the large percentage of missing values in this variable. The analysis shows that the provision of care substantially reduces female labor supply, suggesting that LTC may be incompatible with holding a full-time job. Annual labor supply drops by 367 hours, which is equivalent to 41%, as women in the sample work about 900 hours per year on average. Since women who provide LTC spend an average of about 500 hours per year assisting their parents, these results imply that each hour of care reduces paid employment by 0.73 hours.

Fahle and McGarry (2017) use a sample of women over age 51 from the waves of HRS data collected between 1992 and 2010. They restrict the sample to those who had at least one living parent or in-law and were not providing care in 1992. They define care as providing at least 100 hours of help with basic personal activities over any 24-month period. By 2010, they found that 46% of the sample reported providing care to an elderly parent or parent-in-law. The average cumulative hours of care provided among all individuals was 672, while the average for just those who reported providing care was 1,456. As dependent variables, they include a dummy for working, the number of hours worked per week, and annual earnings. Parameters are estimated with different model specifications, including fixed effects. The analysis shows that LTC has a negative effect on employment and earnings and can thus be detrimental to the financial well-being of caregivers. Under the fixed-effect model specification, the probability of work drops by 2.9 percentage points (significance level of 10%), and labor supply drops by 1.7 hours per week (significance level of 1%); this represents an 8.5% reduction. Over the long run, the study finds that, conditional on positive earnings, having provided care at any point reduces annual earnings by about US\$ 12,400, or 51%.

Our study differs from Johnson and Lo Sasso (2006) and Fahle and McGarry (2017) in that we explore the effect of a parent's need of LTC on women's labor supply, rather than the effect of actually providing care. As we explain in the following sections, this difference is due both to data quality and to concerns about the potential endogeneity of the actual provision of LTC.

3. Data

In the first part of the analysis, we use time-use surveys from Chile, Colombia, Costa Rica, and Mexico to analyze the gender distribution of the burden of LTC and to produce descriptive statistics of labor supply of working-age women who provide care and for working-age women who do not. Then, to estimate the effect of LTC for older people on labor supply while accounting for observed and time-invariant unobserved characteristics, we use data from the MHAS, a nationally representative panel of adults over age 50 in Mexico. We only present results for women because: (i) women supply most LTC; (ii) it is among women that the existing literature finds evidence that LTC affects labor supply; (iii) we find no statistically significant effects of LTC on men's labor supply in the multivariate analysis performed with MHAS data.

The time-use survey data is cross-sectional. For each country, we use the most recent survey, conducted between 2014 and 2017.⁴ LTC is defined as providing assistance for activities of daily living. It is important to highlight survey differences that reduce cross-country comparability. For example, in Chile, Colombia and Mexico, all care-dependent household members are accounted, while in Costa Rica children under age 12 are excluded. In addition, the surveys gather data on support for different numbers and types of activities of daily living (whether basic or instrumental). Table 1 provides a cross-country comparison.

Table 2 presents a few descriptive statistics from time-use survey data. The percentage of women who worked ranged from 45% (in Colombia) to 53% (in Chile). Those who were employed worked between 36 hours (in Colombia and Mexico) and 39 hours per week (in Chile). The percentage that provided care varied between 1.5% in Colombia and 6% in Mexico.

The MHAS collects data on aging, health status, and the burden of disability of Mexican individuals over age 50 (Wong et al., 2015). The first wave of data was collected in 2001, with a nationally representative sample of adults born in 1951 or earlier. Follow-up surveys were conducted in 2003, 2012, 2015, and 2018. In 2012 and 2018, the sample was expanded to include new individuals and thus maintain representativeness of the Mexican population over 50. We combine the five waves of data to create an unbalanced panel. Our analysis is based on a sample of 20,374 women ages 50 to 64. We exclude women over the age of 65, as they have reached the legal retirement age and are therefore substantially less likely to work.

Table 3 presents descriptive statistics for our MHAS sample. Women were 57 years old on average; 35.6% of them worked at the time of the survey; those who worked did so about 40 hours per week; and 14.1% of them had a parent requiring LTC. Most of the women in the sample were married or living with their partner (70%); only 36.3% had completed secondary education or higher; 88.3% classified their health status as regular or excellent; and 75.4% classified their economic situation as either regular or poor.

⁴ Data for Chile is from 2015 and is representative for urban areas only, at both the national and regional level (https://historico-amu.inec.cl/enut/files/documentacion/documento_metodologico_ENUT.pdf). Data for Colombia was collected between September 2016 and August 2017, and is representative at the national, urban and rural levels, and for six regions (https://www.dane.gov.co/files/investigaciones/boletines/ENUT/Bol_ENUT_2016_2017.pdf). Data for Costa Rica is from 2017 and is representative at the national, urban and rural levels (<https://www.inec.cr/sites/default/files/documentos-biblioteca-virtual/reenut2017.pdf>). Finally, data for Mexico was collected in 2014 and is nationally representative (http://internet.contenidos.inegi.org.mx/contenidos/productos/prod_serv/contenidos/espanol/bvinegi/productos/nueva_estruc/70282_5075545.pdf).

Table 1. Definition of LTC in Time-Use Surveys

Country, year	People requiring care	Activities of Daily Living for which care is received
Chile, 2015	Household members who require permanent care.	Eating; going to the bathroom; bathing; dressing; going to bed/lying down; preparing or taking medicine or therapy; travelling to health services.
Colombia, 2016/17	Household members with physical or mental limitations that make it difficult to complete activities of daily living.	Eating; bathing and/or dressing; preparing or taking medicine or therapy; travelling to health services.
Costa Rica, 2017	Household members ages 12 and above with physical or mental difficulties, chronic illnesses, or advanced age that keeps them from performing activities independently, thus making them dependent on time spent by other people on a daily basis to support them.	Eating; bathing, dressing or going to the bathroom; cooking; preparing or taking medicine or therapy; travelling to health services.
Mexico, 2014	Household members who need the care of another person due to physical or mental limitations, chronic illness, or temporary illness.	Eating; bathing and/or dressing; going to bed/lying down; preparing or taking medicine or therapy; travelling to health services; preparing home remedies or special food.

Source: prepared by the authors.

Table 2. Descriptive Statistics from Time-Use Surveys, Women Aged 15-64

Variable	Chile	Colombia	Costa Rica	Mexico
Employed	0.530	0.455	0.465	0.513
Hours of work per week, conditional on working	37.309	41.799	34.529	38.629
Provide care	.037	0.015	.032	0.060
Age	39.052	36.396	36.654	35.973
Completed secondary education (a)	0.587	0.733	0.393	0.411
Number of observations	9,854	48,895	3,458	18,599

Source: authors' calculations based on time-use survey data. Note: for Colombia, the educational variable is defined as finishing middle, vocational, or secondary education (in the data, the three are lumped together in a single category).

Table 3. Pooled 2001-2018 MHAS Descriptive Statistics, Women Aged 50-64

Variable	Obs.	Mean	Std. dev.
Employed	20,080	0.356	0.479
Hours of work per week, conditional on employment	7,227	39.754	20.595
Father or mother requires LTC	18,763	0.141	0.348
Age (years)	20,374	56.711	4.103
Age 50-54	20,374	0.348	0.476
Age 55-59	20,374	0.363	0.481
Age 60-64	20,374	0.290	0.454
Married or living with partner	19,384	0.700	0.458
Number of siblings	19,443	5.592	3.013
Excellent or regular health status	19,348	0.883	0.322
Regular or poor economic status	19,311	0.754	0.431
No schooling	20,125	0.156	0.363
Did not complete primary schooling	20,125	0.262	0.440
Completed primary schooling	20,125	0.219	0.414
Completed secondary schooling	20,125	0.282	0.450
Completed tertiary schooling	20,125	0.081	0.273
Year = 2001	20,374	0.147	0.354
Year = 2003	20,374	0.128	0.334
Year = 2012	20,374	0.245	0.430
Year = 2015	20,374	0.193	0.395
Year = 2018	20,374	0.288	0.453

Source: authors' calculations based MHAS data.

4. Methodology

We calculate descriptive statistics for the association between provision of LTC and labor supply (both employment and number of hours of work) using time-use survey data. Results measure associations in cross-sectional data, with no claim of causality. We then use MHAS data to estimate the following equations:

$$L_{it} = \beta_0 + \beta_1 \cdot LTC_{it} + \beta_2 \cdot X_{it} + \alpha_i + u_{it} \quad (1)$$

Where L represents the dependent variables: a dummy for the status of currently working, and the natural logarithm of the number of hours worked per week in the primary occupation (due to lack of information in the survey on hours worked in a secondary job).⁵ The equation for the number of hours is conditional on working, meaning it is only estimated for observations with a positive number of hours worked. We consider the natural logarithm of the number of hours worked to ensure normality in the distribution of the dependent variable.

⁵ In 2001, the person was asked how many hours she worked during a normal day; from 2003 onward, the person was specifically asked which days she worked in her primary job, and how many hours she worked each day. The figure for 2001 was multiplied by 6 in order to obtain the number of hours worked per week. Results are robust to different assumptions for this parameter.

LTC is the treatment variable and indicates whether the individual has an older parent in need of care.⁶ X is a vector of controls selected based on a review of prior literature. It includes: two dummies for age (50-54 years old, 55-59 years old, with 60-64 as omitted category) to account for nonlinearity; four dummies for level of education (did not complete primary, completed primary, completed secondary, and completed tertiary; with no schooling as the omitted category); a dummy for being married or living with a partner; number of siblings; a dummy for health status self-reported as regular or excellent; and a dummy for economic status self-reported as poor or regular. Finally, X includes time dummies (for years 2003, 2012, 2015, and 2018; with 2001 as omitted category). These time variables adjust for observed and unobserved confounders that vary over years but are constant across individuals, such as macroeconomic conditions (e.g., recessions), administration changes, gender stereotypes (that may be slowly changing over time).

β are parameters to be estimated, α are individual (fixed or random) effects, and u is an error term with the usual distributional assumptions. i and t are indicators for individuals and time, respectively. For variables with a significant percentage of missing values (more than 5%), i.e. being married or living with a partner, number of siblings, economic status, and health status, we replace the missing values with a zero and add a dummy variable indicating that the value is missing (as, for example, in Almond et al., 2010).

As the treatment variable, previous studies used the actual supply of long-term care above a certain threshold (e.g., at least 200 hours in Johnson and Lo Sasso, 2006). Unfortunately, this variable is measured with reference to a timeframe that differs from that of the dependent variables. While labor supply is current, the provision of long-term care is captured over the past two years, which introduces a measurement error in the treatment variable. This problem is compounded by the fact that the actual provision of LTC is most likely endogenously determined, jointly with labor supply. In contrast, our treatment variable is much less likely to depend on the person's individual characteristics.

β_1 is an intent-to-treat estimate. It measures the effect of the need for LTC, irrespective of the daughter's decision to provide it or not. It is an average of the labor market response of daughters who provide LTC and of those who do not. The treatment-on-the-treated estimate is higher, equal to the intent-to-treat estimate divided by the percentage of daughters with a parent in need of LTC who actually supply it. To estimate it, the endogeneity of the decision to provide LTC would have to be addressed. Irrespective of endogeneity concerns, we cannot attempt to estimate it because we do not have information on the actual current supply of LTC.

When the dependent variable is the dummy for working, β_1 estimates the change in the probability of working associated with having one parent in need of LTC. When the dependent variable is the logarithm of the number of hours worked per week, β_1 estimates the percentage change in the number of hours worked, conditional on remaining employed. We use a linear model also in the case of a dichotomous dependent variable because it produces consistent estimates

⁶ The parent may live with the woman, in a separate home, or in an institution. The MHAS also contains information on in-laws in need of LTC. If this is included in the treatment variable (having a parent or in-law in need of LTC), results are not significant. This suggests that women's labor force participation is affected by the care dependence of their own parents, not those of their partner. In contrast, the labor supply of men does not significantly change in either case (parents or in-law in need of LTC).

(under the usual assumptions) and allows accounting for time-invariant characteristics. In contrast, non-linear models like probit or logit with fixed effects are known to be biased because of the incidental parameter problem (see, e.g., Lancaster, 2000; Greene, 2004).

We estimate ordinary least square (OLS, with and without controls), fixed-effect, and random-effect models. The OLS estimates are provided for reference to show how the estimate of the treatment effect changes across models. The fixed-effect model controls for time-invariant observed and unobserved individual characteristics (e.g., genetic characteristics that affect both parent's care dependence and their children's health and therefore ability to work) that may confound the relation of interest. Because of the inclusion of time dummy variables, it also controls for time fixed effects. Finally, the random-effect model is more efficient than the fixed-effect model, but the consistency of its estimates relies on the assumption that the individual effects are independent of both the covariates and the error term (i.e., unobserved factors varying across individuals and over time affecting labor supply). This assumption is typically very strong in practice. For these reasons, we prefer the model with time and individual fixed effects, and we base the discussion of this paper's findings on that model.

5. Gender Burden of LTC and Relationship with Labor Supply in Time-Use Survey Data

The time-use surveys show that women represent the large majority of long-term family caregivers who are of working age (15-64 years old), with shares ranging from 63% in Mexico to 84% in Colombia (Table 4). The gender dimension of family caregiving is even more pronounced when one looks at the percentage of hours provided by women, which ranges from 72% of all working-age caregiving in Mexico to 88% in Costa Rica. This means the average female caregiver spends more hours on this activity than the average male peer.

With the exception of Mexico (where the difference is not statistically significant), long-term caregiving is associated with a sharp drop in women's likelihood of working, ranging from 10 percentage points (p.p.) in Chile to 22 p.p. in Costa Rica (Table 4). In the latter country, only 25% of working-age women who provide LTC also work, as compared to 47% of working-age women who do not provide LTC. This reduction in women's labor supply is doubly worrisome, as it further decreases levels that are already low compared to those of higher income countries.

For women who provide LTC and continue working, work supply is reduced by 6 hours per week in Colombia and 4 hours per week in Mexico (Table 4—means are not statistically different from zero in Chile and Costa Rica). In Colombia, women who both work and provide LTC work an average of 36 hours per week, as compared to 43 for women not engaged in LTC. This means LTC is associated with reduction on both the extensive margin (who works) and on the intensive margin (how many hours) of labor supply.

With the exception of Costa Rica (where the difference is not significant), women who provide long-term care end up with a double burden compared to women who do not provide care

to any family member.⁷ They work more than other women when both employment and LTC are counted, with a difference that ranges from 6 hours per week in Mexico and Colombia to 14 hours per week in Chile (Table 4). In this country, women who both work and provide LTC end up with a total workload of 52 hours per week (the sum of work and LTC), as opposed to 39 hours for women not engaged in LTC. The difference is driven by the provision of 15 hours of LTC per week.

Table 4. LTC and Labor Market Participation in Four Latin American Countries

	Chile	Colombia	Costa Rica	Mexico
<i>Gender distribution of the provision of long-term care by working-age individuals</i>				
Percentage of caregivers who are women	70	84	78	63
Percentage of hours of LTC provided by women	78	86	88	72
<i>Labor market participation of working-age women, by caregiving status</i>				
Percentage of women who provide LTC who work	43	34	25	49
Percentage of women who do not provide LTC who work	53	46	47	51
Change in percentage who work	-10***	-12***	-22***	-2
Women who work and provide LTC, hours worked per week	37	36	29	35
Women who work and do not provide LTC, hours worked per week	39	43	35	39
Change in weekly hours worked, conditional on working	-2	-6***	-5	-4***
Women who work and provide LTC, total hours of work and LTC per week	52	49	35	44
Change in total workload (work + LTC), hours per week, conditional on working	+14***	+6***	+1	+6***

Source: Authors' calculations based on data from time-use surveys. Note: working age is 15-64 years old; p-value of the test of significance of means difference: *** p<0.01, ** p<0.05, * p<0.1.

These results measure the correlation between providing LTC to a family member and labor supply through descriptive statistics from cross-sectional data. They do not prove causality. LTC may be provided by women who would be less likely to work or to work long hours, regardless of their parents' need for care. The lower labor supply may be explained by their observed or unobserved individual characteristics. In the next section, we will aim to control for these confounding factors and uncover causal effects through multivariate analysis of longitudinal data.

⁷ While the concept of double burden is usually applied to comparisons between women and men, here we make the distinction between women who provide LTC and those who do not. Two caveats are worth mentioning regarding the descriptive analysis we present. First, we are not taking into account unpaid housework other than care, which could affect the total number of hours worked. Second, the comparison is between women who provide care and those who do not, recognizing that the latter group includes some women who have family members who require LTC and some who do not (this is the overall approach taken by previous studies summarized in section 2).

6. Causal Effects of LTC on Labor Supply in MHAS Data

Table 5 reports the results of the estimation of equations (1) for both the probability of employment (Panel A) and number of hours worked, conditional on working (Panel B). The first column presents unweighted OLS estimates without controls. It is the parallel in MHAS data of the descriptive results in Table 4, although it is important to note the following differences: (i) the MHAS sample is restricted to women ages 50–64; (ii) the MHAS LTC treatment variable measures having a parent in need of LTC (an intent-to-treat), while time-use surveys capture actual provision of LTC. Despite these differences, the results are in the same order of magnitude. OLS estimates without controls suggest that having a parent in need of LTC is associated with a statistically non-significant reduction in the probability of employment and with a statistically significant drop (6%) in the number of hours worked by women who remain employed.

The next columns present estimates with controls and show that OLS, fixed-effect, and random-effect estimates of the coefficient of the LTC treatment variable (β_1) are very stable and consistently significant (with the exception of estimates of the probability of working from the OLS model with controls, which is only significant at the 10% level of significance). Consistency in magnitude and significance across models is congruent with the estimated effect being causal; the LTC treatment variable does not appear to be endogenous, as adjusting for covariates (in the OLS with covariates and without fixed effects) or even fixed effects does not substantially change $\widehat{\beta}_1$.

Fixed-effect estimates suggest that having a parent in need of LTC reduces women's probability of employment by 2.42 percentage points, and for women who remain employed, it reduces the number of hours worked in the primary occupation by 7.03%. Effects of such magnitude are extremely relevant from an economic and productivity perspective, especially considering that these are intent-to-treat estimates.

We look at data from the 2014 Mexican time-use survey to provide a back-of-the-envelope calculation of treatment-on-the-treated estimates. In this dataset, we observe that 6.85% of women ages 50 to 64 provide LTC. This is likely to be an upper-bound estimate of the figure that we would apply to MHAS data used in model (1), as LTC in the time-use survey is not restricted to women's parents. In Table 3, we saw that 14.1% of women in our sample have a parent in need of LTC. This suggests that no more than 49% of women with parents in need of LTC actually provide it ($0.0685/0.1410=0.4858$). Consequently, treatment-on-the-treated estimates are about twice as large as intent-to-treat estimates. Therefore, for women ages 50 to 64, the provision of LTC is associated with a 5 percentage point drop in the probability of working (which represents a 14% drop in the employment rate for this group), and with a 14% reduction in hours worked for those who remain employed.

Table 5. Effects of LTC on Female Labor Supply in Mexico, Ages 50–64

Panel A – Employment

	OLS	OLS	FE	RE
Father or mother requires LTC	-0.0127 (0.00976)	-0.0175* (0.00950)	-0.0242** (0.0123)	-0.0200** (0.00914)
Age 50–54		0.149*** (0.00831)	0.0346 (0.0217)	0.142*** (0.00847)
Age 55–59		0.0833*** (0.00813)	0.0359*** (0.0132)	0.0830*** (0.00772)
Married or living with partner (a)		-0.202*** (0.00774)	-0.0754*** (0.0207)	-0.183*** (0.00836)
Number of siblings (a)		0.00107 (0.00115)	0.00407 (0.00274)	0.00188 (0.00127)
Excellent to regular health status (a)		0.0534*** (0.00980)	0.0268** (0.0134)	0.0465*** (0.00987)
Regular or poor economic status (a)		-0.00489 (0.00847)	-0.0231** (0.0108)	-0.0114 (0.00794)
Did not complete primary schooling		0.00601 (0.0101)		0.00512 (0.0127)
Completed primary schooling		0.0209* (0.0108)		0.0211 (0.0134)
Completed secondary schooling		0.112*** (0.0111)		0.109*** (0.0133)
Completed tertiary schooling		0.188*** (0.0153)		0.197*** (0.0174)
Year = 2003		0.0159* (0.00961)	-0.00493 (0.00903)	0.0154** (0.00763)
Year = 2012		0.0306*** (0.0110)	-0.0804*** (0.0302)	0.0306*** (0.0106)
Year = 2015		0.0704*** (0.0105)	-0.0640* (0.0328)	0.0668*** (0.0101)
Year = 2018		0.0717*** (0.0103)	-0.105*** (0.0386)	0.0647*** (0.0102)
Constant	0.342*** (0.00365)	0.266*** (0.0170)	0.391*** (0.0408)	0.263*** (0.0178)
Observations	19,605	19,163	19,163	19,163
R-squared	0.000	0.083	0.010	
Number of individuals			10,523	10,523

Panel B – Hours Worked (Natural Logarithm), Conditional on Employment

	OLS	OLS	FE	RE
Father or mother requires LTC	-0.0598** (0.0248)	-0.0667*** (0.0250)	-0.0703** (0.0335)	-0.0777*** (0.0219)
Age 50–54		0.111*** (0.0223)	0.00185 (0.0589)	0.111*** (0.0211)
Age 55–59		0.0872*** (0.0229)	0.0326 (0.0373)	0.0855*** (0.0198)
Married or living with partner (a)		-0.0575*** (0.0161)	0.0127 (0.0550)	-0.0576*** (0.0182)
Number of siblings (a)		0.00246 (0.00275)	0.000182 (0.00742)	0.00409 (0.00297)
Excellent to regular health status (a)		0.00785 (0.0303)	0.00163 (0.0395)	-0.000708 (0.0260)
Regular or poor economic status (a)		-0.0226 (0.0184)	-0.00463 (0.0280)	-0.0150 (0.0182)
Did not complete primary schooling		0.00724 (0.0308)		-0.00432 (0.0326)
Completed primary schooling		0.0667** (0.0316)		0.0631* (0.0339)
Completed secondary schooling		0.101*** (0.0294)		0.100*** (0.0322)
Completed tertiary schooling		0.101*** (0.0320)		0.121*** (0.0382)
Year = 2003		-0.225*** (0.0241)	-0.184*** (0.0253)	-0.201*** (0.0197)
Year = 2012		-0.201*** (0.0243)	-0.286*** (0.0896)	-0.201*** (0.0254)
Year = 2015		-0.261*** (0.0238)	-0.342*** (0.0969)	-0.248*** (0.0242)
Year = 2018		-0.199*** (0.0226)	-0.323*** (0.112)	-0.186*** (0.0241)
Constant	3.532*** (0.00828)	3.600*** (0.0442)	3.744*** (0.117)	3.565*** (0.0445)
Observations	6,636	6,499	6,499	6,499
R-squared	0.001	0.034	0.048	
Number of Individuals			4,493	4,493

Source: Authors' calculations based on 2001–2018 MHAS data. Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10. (a): variables for which missing values were replaced with "0," and a dummy variable for missing value was included in the estimation.

7. Conclusions and policy implications

It is women who traditionally supply long-term care for the elderly and other care-dependent individuals. Time spent caregiving may come at the expense of the ability to invest in a career and experience wage growth. This can make caregivers less prepared to fund their own retirement, hence more dependent on family and government support.

These issues have been analyzed in countries that are further along in the demographic transition, such the United States, but evidence for Latin America and other developing and emerging regions is still mostly anecdotal or descriptive. We provide novel evidence using data from time-use surveys from four Latin America countries (Chile, Colombia, Costa Rica, and Mexico) and the Mexican Health and Aging Study.

Time-use surveys show that women provide the large majority of family LTC. The same data also consistently shows across countries that women who provide LTC are less likely to work, work less hours (for those who do work), and carry a double burden of work and LTC. In Colombia, for example, women who provide LTC are 12 percentage points less likely to work outside the home compared to women without a LTC burden. Women who do continue to work outside of home also work less than other women, with a difference of 6 hours per week, and end up working 6 hours more overall when both work outside the home and LTC are taken into account. This indicates a significant double burden of work, which exists consistently across the countries analyzed and tops out at 14 additional hours of work per week in Chile.

This descriptive evidence does not prove the existence of a causal relationship between need for LTC and lower labor supply. LTC may be provided by women who would be less likely to work or to work long hours, regardless of their parents' need for care. The lower labor supply may be explained by their observed or unobserved individual characteristics. This is the reason for running multivariate analyses that make use of the longitudinal nature of the MHAS data for a sample of individuals ages 50 to 64.

Our findings suggest that having a parent who needs LTC significantly reduces female labor supply on both the extensive and intensive margins. Mexican women ages 50 to 64 whose parents need LTC are 2.42 percentage points less likely to work (or 7%) and work 7.03% less hours if they remain employed. Our results are generally consistent with those obtained for the United States by Johnson and Lo Sasso (2006) and Fahle and McGarry (2017).

This evidence is particularly meaningful for a region that is aging faster than any other in the world and where female labor market participation has historically been low and slow-growing. Aging will increase the burden of eldercare for households, while families are becoming smaller, have fewer children, and are more geographically dispersed. The burden of LTC may constrain the future growth of female labor supply, with negative effects on economic growth. All of these considerations point to the need for reforms to rebalance the burden of care within families and reduce its impacts on career development and the retention of human capital. Reform alternatives include telework policies and part-time work for family members (irrespective of their gender) of care-dependent older people. In parallel, the professionalization of LTC may drive the creation of

millions of high-quality, formal jobs for both women and men, as it has in other regions in the world.

Our results contribute to the policy dialogue about the need to develop LTC systems in Latin America. It is a matter of rights and quality of life for a growing population of older people. It is also a matter of gender equality and economic opportunities: the burden of household care work needs to be rebalanced to ensure women can fully participate in economic activities outside their home.

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