The Simulated Impact of Universal Elder Care on Paid and Unpaid Work in Mexico

Thomas Masterson, Aashima Sinha, Fernando Rios-Avila, and Ajit Zacharias

September 30, 2024

Public provisioning of elder care has the potential to reduce the amount of unpaid work time that households must devote as well as enable individuals, especially women, to engage in paid employment. We model the impact of universal elder care provision in Mexico by simulating employment and time use changes based on estimates of the macro-level impacts of such a policy. We use the Levy Institute Measure of Time and Income Poverty (LIMTIP) framework to assess these changes in time use and earnings on the time and income poverty of Mexican households. This impact includes the direct effect on those households currently devoting time to unpaid care work for elderly household members, as well as those individuals that would likely receive jobs in the newly expanded care sector and their households. We find that the direct impact on time use is to substantially reduce time spent on unpaid care work by women especially in recipient households. The direct impact on employment is modest: a small increase in the employment rate. When all the channels of impact are taken into account, time poverty rates fall for individuals in households that received care services but increased for individual that received new employment. Thus, the poverty-reducing impact of the increase in employment and reduction in unpaid work time is partially offset by the increase in time poverty due to increased time spent in income-generating

activities.[1]

1. Introduction

In recent years, there has been increased interest in the expansion of social care services in Mexico as well as in other countries. This is due partly to the recognition that the responsibility for unpaid care work, which falls most heavily on women within households, is a major obstacle to women's labor force engagement. Unlocking this potential labor is thought to be important due to its positive impacts on economic growth, on women's economic empowerment, or both. The expansion of social provisioning of care services is thus promoted with an eye towards the development goals of economic growth, gender equality, and poverty reduction. Relatively little research has directly examined these linkages between social provisioning of care, the expansion of employment opportunities for women, and growth. Even less attention has been paid to the potential impact of labor force engagement for women's time use and time poverty.

ONU Mujeres has produced aggregate estimated impacts of three social infrastructure interventions in the system of social provision in Mexico: universal free quality childcare; extended school days for school age children; and provision of universal elder care. In each case the estimates have utilized injections of spending in to specific sectors outlined in the reports for each specific intervention, based on the Input-Output table for Mexico. These estimated impacts include the overall cost of each intervention, the aggregate impact on output and employment, as well as the impact on the fiscal balance for the government of Mexico. We estimated the impacts, both direct and indirect, of the provision of unversal elder care services. These impacts include both the direct impacts on the time use of individuals in affected households and the income and time use impacts of the employment generated by the spending required to provide these services.

The provision of universal elder care would potentially impact every household with an elderly person that needs care. Universal provision greatly reduces the responsibilities of household members to provide care, whether it is direct care in the form of feeding individuals, bringing them to appointments, or just being present to

[1]This work was carried out for the project "Assessing the Impact of Social Care Expansion in Mexico: Time Use, Employment and Poverty" supported by the United Nations Research Institute for Social Development (UNRISD). The project coordinator is Rania Antonopoulos. Thomas Masterson is the Principal Investigator. The research team is Fernando Rios-Avila, Aashima Sinha, and Ajit Zacharias. Michelle Augusto Borges and Emily Huang contributed research to this project.

make sure that the individual has access to help if needed. The impact of reduced supervisory care may not have a large impact on the time spent on household production activities, since these are typically done concurrently with supervisory care. However, relief from supervisory care may free individuals to engage in paid work that the responsibility for supervising the elderly may not currently allow.

2. Literature Review

Over the last two decades, a substantial literature has developed on unpaid care work, both child and elderly care, and its negative impact on care providers' employment, earnings, physical and mental health, and time poverty (Neal 1993; Moen, Robison, and Fields 1994; Ettner 1995, 1996; Carmichael and Charles 1998, 2003; Carmichael, Charles, and Hulme 2010; Berg-Weger, Rubio, and Tebb 2000; Lee, Walker, and Shoup 2001; Martire and Stephens 2003). While care activities can broadly take place in three spheres of the economy–household, public, and market–global evidence indicates that most of the care responsibilities is borne by households/families, and within them particularly by women, owing to gender norms and family bargaining power dynamics that drive the gender division of paid and unpaid work (Robles 2000; Varley and Blasco 2000; Esquivel 2011; Lloyd-Sherlock et al. 2018). Globally, unpaid care work constitutes nearly 2 billion work hours per day, of which three quarters are performed by women (Addati et al. 2018). Scholarship has highlighted the gendered nature of family care work (Hooyman and Gonyea 1995; Folbre and Himmelweit 2000; Folbre 2006; Garey et al. 2002; Razavi 2011), and has identified persistent gender inequality in the sharing of unpaid care work as one of the key reasons contributing to gender gaps in employment and wages (Razavi 2007; Antonopoulos and Hirway 2010; Ferrant, Pesando, and Nowacka 2014; Elson 2017), thereby posing challenges to overall gender equality. The role of family caregivers becomes even more crucial in the absence of public and affordable market provisioning of care. Moreover, despite the lack of formal training and monetary compensation, family caregivers have been found to operate as part of the geriatric health care workforce. Studies highlight the importance of recognizing the role of family caregivers as a "shadow workforce" because the care work that they do not only within the household but also in health care institutions is largely unseen and unrecognized (Bookman and Harrington 2007).

In many low- and middle-income countries (LMICs), and so across Latin America, formal or institutional care services for dependent elders remains limited. Negligible public provisioning of formal care and low income levels prevent households from affording quality market substitutes, resulting in the primary caregiving responsibilities falling on family care providers, particularly women, often at the cost of their

own well-being (Gomes da Conceicao and Montes de Oca 2004; Bernabe-Ortiz et al. 2016; Flores-Castillo 2012). Mexico is no exception: there is no national social care system, and subsidized long-term or elderly care services are nearly non-existent. Moreover, there are no special benefits in place to help family providers of elder care such as tax incentives, monetary support or respite care support. For workers attached to a social security institution, leave schemes do not provide any special arrangements for family care providers. In 2013, only 26.1 percent of those 60 years and over had a retirement pension, and this percentage is higher for men compared to women (35 percent versus 18.5 percent) (INEGI 2014). In other words, a significant segment of the older population in Mexico lacks access to any safety net. Few federal and state-level programs target older adults, and the only public social care services available, such as day care and institutionalization, are through the National Institute for Older Adults (Instituto Nacional para las Personas Adultas Mayores, INAPAM) and the National System for Integral Family Development (Sistema Nacional para el Desarrollo Integral de la Familia, DIF). On the other hand, private sector capacity for offering long-term care has grown only slightly, mainly because of its high costs which makes it affordable only to a small percentage of older adults who are wealthy or receive a substantial pension (López Ortega and Jiménez Bolón 2014). In such a setting, care provided informally within the family becomes an important source of financial and nonfinancial support for the elderly. A tradition of extended family, in which several generations live together, and share caregiving responsibilities, contributes to persistent dependence on informal family care provisioning. Family care arrangements and bargaining processes are highly gendered, and largely conform to prevailing cultural norms (Lloyd-Sherlock et al. 2018). The strong intra-familial pressure to provide care may affect care providers' opportunities to participate in the labor market, particularly for the generation in the middle taking care of both children and elderly, sometimes called the sandwich generation (Miller 1981).

Elder care is gaining increasing attention due to the demographic shifts towards an aging population, increase in life expectancy, and decline in fertility rates. A growing body of research substantiates that Mexico, is at the forefront of this transformation in Latin America (Vega et al. 2015; Burniaux, Duval, and Jaumotte 2004; CISS 2005). The aging process in Mexico is taking place in a context of wide economic disparities, few viable public strategies for supporting an aging population and extensive reliance on family care givers, and limited economic security of older adults. This aging of the population will increase the demand for elder care (Jackson, Strauss, and Howe 2009; Rossel 2016). In Mexico, the elderly population (aged 65 years and above), nearly doubled over the last two decades reaching 10 million in 2021 (UN Population

Division, 2022), resulting in a dependency ratio of 10 percent. Moreover, this segment of the population is expected to nearly triple by 2050, aggravating the pressure on the working age population. Statistics reveal that adults 65 years and older will increase from 9.8 older adults per 100 working age persons in 2015 to almost 29 older adults by 2050 (Department of Economic and Social Affairs, UN Population Division, 2015). In addition, the life expectancy has been rising, at 60 years old it is estimated at 22.9 years for women, and 20.9 for men, which further indicates an increasing pressure on care demand.

Households in Mexico are characterized by an extended family structure such that the majority of the older population lives at home with their spouse or partner, children, grandchildren or other close relatives, seeking care from other family members, mostly women (Monkkonen 2011; Gomes da Conceicao and Montes de Oca 2004). In other words, the family remains the major source of support for most aging parents in Mexico despite recent efforts to expand social pensions and health care access (Gutiérrez Robledo, López Ortega, and Arango Lopera 2012; Angel et al. 2016). The National Institute on Aging (Instituto Nacional de Geriatría, INGER) was created in 2008 because of the need to produce more geriatric specialists and the need to develop human resources dedicated to elder care. INGER contributes to improving national policies on aging and age research and the creation of health care systems according to the needs of the aging populace. Gutiérrez Robledo et al. (2012) recommend that Mexico should continue to build programs and policies with a human rights perspective and orient efforts towards adaption of health care that addresses the needs of the elderly. Moreover, there is a need to focus on providing the elderly with primary care, education, and resources to avoid functional dependency and enhance healthy aging. More recently, at the local level, the government of Mexico City, with support from the Economic Commission for Latin America and the Caribbean, launched a caregiving program in 2015 that trains health care professionals to supervise and support caregivers and family members who care for older adults (Amieva Gálvez 2015).

To some extent declining fertility rates, rural-urban and international migration, and women's increasing participation in the labor force may change family structure and composition, restricting the availability of family care (Gutiérrez Robledo, López Ortega, and Arango Lopera 2012). However, in the absence of adequate public or institutional provisioning of care, women will continue to bear the burden of caregiving either by reducing their labor market participation or combining their employment hours with caregiving, thereby engaging in the double burden of work. Despite an aging population and increasing life expectancy, which means that more elders will need care for longer periods of time, Mexico does not have adequate care

policies in place to ensure the treatment, daily care and well-being of elderly (Hakkert and Guzmán 2004). Limited fiscal resources and the needs of a large low-income population limit the possibilities of institutional care provisioning. In light of this discouraging situation, it is families, mainly women, who continue to be responsible for looking after elders (Montes de Oca 2004). There is consensus between academic literature and government institutions (such as the National Population Council) that elderly care in Mexico is largely the responsibility of the family. Only the middle- and upper- income classes can seek support from private services. The situation is even more concerning given the high rates of gender inequality in the country which can potentially widen if women continue to take the responsibility of elderly care. Reforms are needed to put in place comprehensive long-term care policies and a social care system that integrates existing efforts, regulates them and allows for monitoring and evaluation of their overall quality and impact on households' wellbeing (Gutiérrez Robledo, López Ortega, and Arango Lopera 2012).

Growing demand for elder care can lead to conflicting decisions regarding competing social investments and threaten the development of educational and employment opportunities for younger generations who are primary care providers. In recent years there is growing evidence on the contemporaneous negative effects of providing care on labor market outcomes. Most U.S. and European studies find a negative relationship between female labor force participation and caregiving (Ettner 1995; Pavalko and Artis 1997; Heitmueller 2007; Carmichael and Charles 1998, 2003; Bolin, Lindgren, and Lundborg 2008; Crespo and Mira 2014; Ciani 2012). The magnitude of this negative effect varies across studies, ranging from no effect to a 30-percentage point decrease in the probability of working. In addition, researchers have found different thresholds of caregiving intensities above and below which the impact varies, the negative relationship being stronger amongst intensive caregivers (Carmichael and Charles 1998; Heitmueller 2007; Casado-Marín, García-Gómez, and López-Nicolás 2011). Moreover, studies show that there is differential impact of caregiving for co-resident versus care receivers not residing in the same household (Ettner 1995; Heitmueller 2007). Casado-Marín, García-Gómez, and López-Nicolás (2011) find that in Spain, labor market effects appear to be concentrated among intensive caregivers (more than 28 hours per week), co-resident caregivers, and those who provide care for long periods. On the other hand, Skira (2015) provides evidence for the U.S. on the short- and long-term effects of caregiving for an elderly parent on woman's current and future labor force participation, at the intensive and extensive margins, as well as on wages in one comprehensive framework. The author estimates a dynamic discrete choice model of elder parent care and work in an inter-temporal framework that includes a forward-looking adult daughter, parental health uncertainty, human

capital accumulation, and labor market frictions. The findings reveal that women are more likely to provide intensive care when their parent is no longer healthy, intensive caregivers are less likely to be working; women who begin care provision are likely to continue to do so and it is difficult to return to labor market if a woman leaves paid work while caregiving. Moreover, women who leave work forgo experience and the associated wage returns and face a lower expected wage if they return to work. Finally, the median cost for elderly caregiving by a woman in her mid-50s was found to be USD 164,726 over two years, which is comparable to the cost of two years of nursing home care. Most studies examining the quantitative impact of caregiving on family care providers are limited to developed countries, whereas studies focusing on Latin America, particularly Mexico have used mixed-methods approach, mostly qualitative analysis and incorporate the role of cultural norms, gendered power relations and country-specific government actions to evaluate work-family linkages (Blanco and Pacheco 2009; Mayston et al. 2017; Lloyd-Sherlock et al. 2018). Using data from the Mexican Health and Aging Study, Van Gameren and Naranjo (2015) show that women are more likely to provide care if the parents suffer from health problems and live in the same household. Moreover, simulation results show that a scenario with more parents living but in better health than the elderly in the sample, in combination with fewer and older grandchildren, is likely to reduce individual care needs but lead to only a small increase in labor force participation rates. The authors show that increased participation rates can be expected if future generations of women have a stronger connection to the (formal) labor market.

Overall, evidence suggest that policy debates about aging population and care reforms require greater attention to the contribution of family caregivers in order to develop new policies that will be responsive to economic, health, and quality-of-life issues of both care providers and recipients. There is growing emphasis on community-based and residential care services, disability benefits, caregiver allowances, adult day-respite services (Feinberg 2004; Gitlin et al. 2006; Skira 2015), in addition to enhancement of health insurance schemes and scaling up of social pensions, which are important components of social and economic well-being of elderly (Mayston et al. 2017). The authors highlight the crucial point that in LMICs, the availability of health and social care systems are lagging socio-demographic changes, leaving families to negotiate a 'journey without maps'–without the structure and support similar to those offered by various health and social policies in many developed high-income countries. As a result, family resources are overexploited in LMICs, and security of older people are threatened. Efforts are needed in the public policy space such that elderly population are regarded as a priority group and care, a human right, along with redistributing care burden from family care providers to the public space.

3. Data and Methodology

3.1. Data

The base dataset for our estimations is the synthetic dataset we created for a related study on the impact of the provision of universal early childhood education (Masterson et al. 2022). This synthetic dataset was created by statistically matching the Encuesta Nacional sobre el Uso del Tiempo (ENUT) for Mexico carried out in 2019, with the 2020 Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH) for Mexico. For details of the statistical matching and LIMTIP estimates see Masterson et al. (2022). We also use the estimates of required spending for the provision of universal elder care in Mexico reported in Bango (2020).

3.2. Methods

We first estimate the direct impact of the provision of universal elder care on the time use of individuals in affected households. The method we use to estimate this impact for each policy proposal is described below. We then model the direct impact on employment as well as the indirect impacts on time use due to changes in employment status. In this step we incorporate both the direct impact of the expansion in spending and subsequent increase in employment, as well as changes in labor supply response due to the changed responsibility of adult household members to provide elder care within those households directly affected by the policy. These methods are described in the third section below.

3.2.1. Direct Impacts

We estimate the direct impact of the UEC policy on time use of individuals in a straightforward manner. In the ENUT we can identify those individuals who report providing care to elderly household members as well as the time they spend on caregiving. The time use survey specifies the time spent caring for those who are either ill (whether chronically or temporarily) and/or disabled (physically or mentally). We can also identify which household members fall into those categories and check which of them are elders. This allows us to calculate the time spent on elder care by each member of the household that is surveyed for their time use.

The ENUT has eleven activities that comprise care for adults. The last is supervisory elder care.[2] Although the social provision of elder care will not eliminate the

[2]Question 6.11.11: "Durante la semana pasada, sea en la casa, hospital u otro lugar, ¿usted mientras hacía otra cosa, lo(s) cuidó o estuvo al pendiente?" During the last week, whether in

other activities done at the same time, we will nevertheless include this time as part of the direct impacts of the policy, both because supervisory care acts as a restraint on individuals' ability to engage in paid work outside the household, and because we incorporate this time into our measure of household production in the estimation of LIMTIP.[3] We will assess the direct impact of the social provision of elder care by estimating a model of time spent on adult care that includes the number of elders and the number of non-elders requiring care in the household and using the estimated marginal impact of elders requiring care in the household to reduce time spent on adult care. For details of the method and results of the estimations, see Appendix A. It may be the case that non-elders require more or less care than elders. We examine the households in which there is only one elder or only one non-elder and look for economically significant differences in time spent (at the household level) in providing care for each group, broken down by the type of disability[4] and the care activity. The results are presented in Table 3-1, below.[5] Overall, there are more than twice as many households with only non-elders requiring care than those with elders requiring care. In all, 9.7 percent of households in Mexico have at least one adult that requires care. Apart from chronic illnesses, households spend more time caring for non-elders than for elders (see Table 1). When we subtract time spent on supervisory care, we find that in the case of illness, whether temporary or chronic, households spend more time on non-elder care than on elder care. Households spend equal amounts of time on direct care for non-elders and elders with physical or mental disabilities. The largest differences in time spent on supervisory care are for those with illness. However, while there is no difference in the time spent on non-elders who are chronically and temporarily ill, households spend more than twice as much time on supervisory care of elders that are chronically ill compared to those that are temporarily ill.

There are smaller differences in time spent on other activities, and in many cases

the home, at the hospital, or some other place, did you take care of or keep an eye on him or her while you were doing something else?

[3]We implicitly assume that this kind of multitasking effectively reduces the amount of time being spent on other activities by adding it to total time spent and scaling the individual total across all activities to the actual number of hours in a week.

[4]Note that for each individual requiring care, only one reason of the four possibilities can be chosen in the interview process. While there may be significant numbers of individuals that have more than one of these limitations, we can only proceed as though the listed limitation is the only one.

[5]Households that have both elders and non-elders requiring care are excluded from these averages. These households (97,156) comprise 0.2 percent of all households and 2.5 percent of households with adults that require care. Households with more than one adult (299,099 with more than on non-elder, and 88,796 with two elders) requiring care are also excluded.

these are negligible. The activity requiring the most time is helping the individual receiving care to eat. The time required ranges from 2.3 hours per week for elders with temporary illnesses to 5.8 hours for elders with mental limitations. Differences in time required to help elders and non-elders eat are less than an hour per week, and in the case of chronic illness there is no difference, and in the case of chronic illness there is no difference. Three of the categories appear to apply almost entirely to non-elders: travel to classes or work; help with school or work tasks; and attending meetings or other activities. The lack of time required for elders for these activities is not surprising. One other notable difference is in time required for travel to appointments, with chronically ill non-elders requiring 3.1 hours per week, compared to 1.7 hours per week for elders. Given the differences, especially in time spent on supervisory care, an important question is the prevalence of households with both elder and non-elder individuals requiring care.

Table 1: Average hours per week spent on care activities by disability type, elder status, and activity, for households with just one adult requiring care

	Chronic Illness		**Physical Limitation**	
Activity	Non-elders	Elders	Non-elders	Elders
Eating	3.8	3.8	2.8	3.2
Hygiene	1.6	1.4	2.1	2.4
Mobility	0.9	1.0	1.4	1.7
Cooking	1.2	1.0	0.5	0.5
Medical	1.7	1.4	0.8	0.8
Travel for appointments	3.1	1.7	0.8	1.1
Physical therapy	0.7	0.5	1.1	0.6
Travel to classes/work	0.4	0.1	0.5	0.0
Help with school or work tasks	0.7	0.0	0.7	0.1
Attending meetings, activities	0.2	0.0	0.1	0.0
Supervisory care	16.6	22.6	23.5	21.1
Total Care	31.0	33.3	34.4	31.6
Total Direct Care	14.4	10.7	10.9	10.5

	Mental Limitation		**Temporary Illness**	
Activity	Non-elders	Elders	Non-elders	Elders
Eating	4.7	5.8	3.2	2.3
Hygiene	2.9	3.0	1.9	1.1
Mobility	1.2	1.3	1.9	0.7
Cooking	0.7	1.0	0.9	0.6
Medical	1.1	1.4	1.5	1.1
Travel for appointments	1.1	1.0	2.2	2.7
Physical therapy	1.5	0.5	0.2	0.2
Travel to classes/work	0.9	0.0	0.7	0.0
Help with school or work tasks	0.6	0.0	1.0	0.0
Attending meetings, activities	0.2	0.0	0.1	0.0
Supervisory care	35.0	29.4	16.7	10.2
Total Care	49.9	43.4	30.5	19.0
Total Direct Care	14.9	14.0	13.8	8.8

Source: Authors' calculations based on ENUT 2019

Nearly one of ten Mexican households have adult members that require care (see Table 2, below). Only 97,156 of the 3.9 million households have more than one

individual requiring care. Most of these are households with one non-elder and one elder requiring care. For households with only elders receiving care, adjusting care responsibilities for the provision of universal elder care provision is straightforward. However, in those cases where there is a mix of elders and non-elders receiving care, we will apply observed differences in care time, separately for direct and supervisory care.

Table 2: Number of households by number of non-elders and elders receiving care

Number of	**Number of Elders**		
Non-elders	0	1	2
0	36,053,371	1,082,211	88,796
1	2,308,489	85,137	2,203
2	227,966	9,816	0
3 or more	71,133	0	0

Source: Authors' calculations based on ENUT 2019

3.2.2. Indirect Impacts

To estimate the full effects of these policy proposals on household time use, as well as on time and income poverty, we carry out a microsimulation based on the expenditure changes elaborated in the reports for each policy scenario (Bango 2020; ONU Mujeres 2020). Our procedure begins by deploying an input-output model based on the aggregate spending in the two policy scenarios to produce our own estimates of employment generated at the four-digit industry level. For a detailed explanation of the procedure employed, see Appendix B. We then aggregate the resulting employment into two-digit industries for the two policies in order to carry out our microsimulation model.[6] We divide the industry-level changes in employment across occupations using the existing occupational distribution in the ENIGH. We then identify potential job recipients and predict the likelihood of their being employed, as well as the ranking of industry and occupation that they are likely to find work in. For each scenario, the likelihood of being employed for each individual will be modified according to the policy scenario and whether they are directly affected. For example, individuals in households with disabled elderly persons will have the presence of such individuals set to zero for the prediction of their likelihood of employment in the UEC policy scenario. Next, we use a hot-decking statistical matching procedure to assign jobs to each potential recipient in the order of their

[6]The method requires aggregating the employment changes due to limitations in the number of records available in the base data set (ENIGH).

likelihood of being employed, and their likeliest industry and occupation, until all of the jobs predicted to be created are used up. Once this is done, we re-assign household production hours to all those individuals in households with job recipients, using another hot-decking statistical match. The result is a new distribution of time spent by individuals on household production and income generation, as well as earnings and household income.

With the resulting distributions of income and time for each policy scenario, we recalculate LIMTIP. First, we recompute time deficits for individuals using the thresholds calculated for the direct impact simulation above. Then we adjust income poverty thresholds with the new levels of household time deficits and categorize individuals and households by time and income poverty status. A detailed description of the microsimulation is provided in Appendix C.

3.2.3. Scope for impacts on time use

The average amount of time spent by households on elder care is about 33 hours per week. When supervisory care is excluded, the mean is about 8 hours per week. However, supervisory care, though by definition performed while doing other activities, is a constraint on what those other activities might be. Specifically, in the context of this project, it is certainly a constraint on the employment possibilities for anyone engaging in this type of care. Thus, relieving individuals of supervisory care responsibilities will provide a degree of freedom to pursue paid work. We first analyze who is likely to be impacted by the relief on time constraints resulting from the provision of universal elder care.

Unsurprisingly, women are more likely to be engaged in elder care work (see Table 3, below). Over 60 percent of individuals providing elder care are women. We see this beginning in adulthood (females from 12 to 24 make up the same share as their male counterparts). Working age men make up relatively small shares of individuals performing eldercare (just over 20 percent are men aged 25 to 64). Not surprisingly, the largest component by age of this care giving labor force are the elderly themselves. Elderly men and women make up 12.1 and 15.4 percent, respectively. Over one quarter of those providing elder care are women aged 55 and up.

Table 3: Shares of individuals performing elder care, by age and sex

Age	**Male**	**Female**
12 to 24	7.5	7.6
25 to 34	4.5	5.9
35 to 44	5.0	9.4
45 to 54	6.3	9.7
55 to 64	4.3	12.4
65 and older	12.1	15.4

Source: Authors' calculations based on ENUT 2019

In addition, women spend significantly more time on care than their male counterparts, in every age category, averaging 9.5 more hours per week, overall (see Table 4, below). The largest difference is among individuals aged 45 to 54. Men aged 55 to 64 that provide elder care spend over 24 hours per week, on average, but this is lower than women in every age category, except for 12 to 24.

Table 4: Mean hours per week of elder care for those performing it, by age and sex

Age	**Male**	**Female**
12 to 24	10.3	15.1
25 to 34	14.0	26.8
35 to 44	19.9	23.9
45 to 54	13.0	32.9
55 to 64	24.1	31.6
65 and older	22.3	27.6
Total	17.5	27.0

Source: Authors' calculations based on ENUT 2019

Table 5, below, breaks down the individuals that provide elder care in households by sex, marital status and employment status. There are important differences. First note that very few of these caregivers are unemployed (not working but looking for work). The largest share (35.9 percent) of these caregivers are women that are not in the labor force. This is the group of interest in terms of the impact of this policy on women's labor force participation. Most of these women (61.8 percent) are married. Among both unmarried men and women, a greater share of caregivers are employed than not in the labor force, while the same is true of married men. A much greater share of married women caregivers are not in the labor force than are employed. However, more than a third of female caregivers that are not in the labor force are aged 65 and older. So, although universal eldercare would relieve many

women (especially elderly women) of the responsibility for providing care for elders in the household, the overall impact on women's labor force participation is likely to be modest.

Table 5: Shares of Individuals Providing Elder Care, by Sex, Marital Status, and Employment Status

	Male		**Female**	
	Not married	Married	Not married	Married
Not in labor force	6.0	8.5	13.7	22.2
Employed	12.7	12.1	15.6	8.9
Unemployed	0.4		0.0	

Source: Authors' calculations based on ENUT 2019

As we can see in Table 6, below, the amount of time that female caregivers devote to elder care is significantly greater than the amount of time spent by male caregivers. This is true for all combinations of marital and employment status. It is notable that the difference between employed and married men and women is quite large: employed married women devote nearly twice as much time to elder care as their male counterparts. The relief of the burden of responsibility for this care will, for those experiencing time poverty, be very beneficial and should reduce the rates of time poverty for these individuals, as well as the time adjusted poverty of the households that have elders that require care.

Table 6: Mean hours per week of elder care for those performing it, by sex, marital status, and employment status

	Male		**Female**	
	Not married	Married	Not married	Married
Not in labor force	19.1	25.7	27.1	30.8
Employed	15.5	12.9	22.7	25.1
Unemployed	28.4		86.4	

Source: Authors' calculations based on ENUT 2019

Given the potential for reduction in time poverty and increase in labor force engagement we have seen above, we move on now to analyze the direct outcomes of reductions in time spent on elder care.

4. Direct Impacts on Time Use

We first present the reduction of direct and supervisory care time spent by individuals that would be directly affected by the policy implementation. The average change

in time spent on these care activities for women is reported in Table 7, below. The averages are broken down by women's time and income poverty status, according to our estimates of LIMTIP for 2020. There is little variation in the impact across these categories. Both the time nonpoor and the income nonpoor seem to get a greater benefit from the reduction in care time. If time and income poverty themselves restrict the amount of time that individuals have to devote to eldercare, this may explain why we see this pattern. Those who are time nonpoor or income nonpoor simply have more time available to them.

Table 7: Changes in care time of women affected by eldercare expansion, by time and income poverty status

	Reduction
Income Poor, Time Poor	2.9
Income Poor, Time Nonpoor	3.1
Income Nonpoor, Time Poor	4.0
Income Nonpoor, Time Nonpoor	3.9

Source: Authors' calculations based on ENUT 2019

The modest scale of the reduction in time responsibility predicted for the provision of universal eldercare leads us to believe that there will be a small increase in the labor force engagement of the women that are affected, assuming that employment opportunities exist. This question will be addressed in the next section.

5. Employment Impacts

The expansion of care services will naturally increase employment, especially given the labor-intensive nature of many of the services being provided. Our method produced aggregate job increases of 667,030 as a result of the provision of universal elder care. We expect therefore that employment rates will rise, given the scope of the intervention. We carried out microsimulations based on our job growth estimates. We review the results of the simulation in terms of their impact on employment in the following sections. First, we discuss the estimated impacts of our policy variables on the likelihood of women being employed.

During the course of the employment simulations, we estimate the likelihood of being employed for everyone in the donor and recipient pool. We find that the impact of having elders that need care in the household is to reduce the predicted likelihood that women will enter employment by 2.6 percent per elder in need of care.[7] Since

[7]Evaluated using the **margins** command in STATA, which produces the average marginal effect.

most households have just one elder requiring care, women in those households are predicted to be 2.6 percent less likely to be employed. Thus, the implementation of universal elder care could increase the employment of women in those households.

The distribution of the newly employed by sex, age, and location is in Table 8, below. It is noteworthy that the majority of the jobs were taken by those in urban areas (five of every six jobs). Also, men were more likely to receive new jobs than women (receiving two of every three jobs nationally), particularly in rural areas, where 93 percent of the jobs were taken by men. Young women were much more likely than older women to take up new jobs, while job recipients were fairly evenly distributed by age among men. These patterns are driven by the industrial composition of the employment changes. Nearly one of every four jobs created is in the construction industry (mostly building new elder care facilities), in which employment is dominated by men. A third of the jobs are in the health care industry, in which much of the higher-paying employment (professional and administrative occupations) is dominated by men.

Table 8: Job Recipients by Location, Sex and Age

	Urban	**Rural**	**Mexico**
Female			
Younger 25	67,259	3,891	71,150
25 to 34	63,300	2,723	66,023
35 to 44	57,190	1,072	58,262
45 to 54	22,070	464	22,534
55 to 64	9,301	121	9,422
65 and older	3,359		3,359
Total	222,479	8,271	230,750
Male			
Younger 25	43,302	23,157	66,459
25 to 34	51,566	19,938	71,504
35 to 44	43,716	32,474	76,190
45 to 54	49,612	21,108	70,720
55 to 64	55,912	14,365	70,277
65 and older	29,638	6,544	36,182
Total	273,746	117,586	391,332
Total			
Younger 25	110,561	27,048	137,609
25 to 34	114,866	22,661	137,527
35 to 44	100,906	33,546	134,452
45 to 54	71,682	21,572	93,254
55 to 64	65,213	14,486	79,699
65 and older	32,997	6,544	39,541
Total	496,225	125,857	622,082

Source: Authors' calculations based on synthetic file

The modest increase in employment compared to the size of the labor force (59 million) means that the employment rate (the ratio of the number in paid employment to the size of the adult labor force) does not change dramatically (see Table 9, below). For women in urban areas, there is a 0.4 percentage point increase, while the rate is virtually unchanged for women in rural areas. There is a more modest increase for men of 0.2 percentage points overall and in rural areas, though the increase is 0.3 percentage points in urban areas.

Table 9: Employment Rate by Sex and Location of Persons 18–74 Years of Age (percent), Baseline and Simulated

	Urban	**Rural**	**Total**
Female			
Baseline	53.2	43.2	51.3
Simulation	53.6	43.3	51.7
Male			
Baseline	81.8	88.4	83.2
Simulation	82.1	88.6	83.4
Total			
Baseline	66.7	65.6	66.5
Simulation	67.0	65.7	66.8

Source: Authors' calculations based on synthetic file

Employment growth, while small compared to the overall level of employment in Mexico, has a noticeable impact on overall employment rates, especially in urban areas. The employment gains are slanted towards men. The difference is driven by the relative gender composition of the industries in which the initial expenditures for each scenario occur, with less spending going towards more feminized industries. The majority of the jobs go to younger individuals (under 45 years of age). Given these results, we can expect to see substantial changes to the distribution of earnings and time spent on household activities, a subject to which we turn our attention next.

6. Time and Income Poverty

Our microsimulations are built on the synthetic dataset created for the estimation of the LIMTIP for Mexico for 2020. As a result, in the microsimulations we can consider changes in time spent on income-generating activities and household production work, as well as changes in earnings. These changes, together with the direct effects of the two policy scenarios on time use, change the time and income poverty status of households in indeterminate ways. We cannot say a priori whether a policy change will lift an individual household out of time and income poverty or have the opposite impact. The direct effects of the policy changes have an unambiguous impact on the time use of household members, reducing the time spent on unpaid household care work for those impacted. For those transitioning into paid employment, on the other hand, the increased earnings will often come with an increased likelihood to suffer time poverty and it is an empirical question whether the increased earnings

offset the increased time deficits sufficiently to lift an income poor household out of poverty or keep an income non-poor family out of it. In this section we analyze these questions for individuals and households in Mexico, with a special focus on those directly impacted by each policy and on those individuals in households with job recipients.

In our simulation of the impact of implementing universal elder care, roughly 1.4 million adults had a reduction in time spent on household production time. Three quarters of these individuals were in urban areas, slightly less than the general population. In both urban and rural areas, women were more likely to see reductions in time spent: 60.6 percent and 55.4 percent in urban and rural areas, respectively. Reductions were on average 3.6 hours per week for women and 4.4 hours per week for men, with little difference between individuals in rural and urban areas. These impacts are substantial for those directly affected, but they are not widespread enough to change the overall averages.

The direct effect is negligible in terms of average household production time for employed persons (see Table 10, below). Only 37 percent of the job recipients in our simulation were women, and 96 percent of those were in urban areas (see Table 8, above). The relatively small addition to employment has little to no effect on overall average of employment hours for the employed. The combined effect of the transition into paid work and re-allocation of household production responsibilities has the effect of negating the small gains due to direct effects for women in urban areas and overall, as well as men in rural areas. This was also true for the overall average household production time for both men and women.

Table 10: Average Weekly Hours of Employment and Required Household Production of Employed Persons (18–74 years of age) by Sex, Baseline and Simulated

	Employment Hours		**Household Production Hours**		
	Baseline	Total Effect	Baseline	Direct Effect	Total Effect
Urban					
Female	39.6	39.7	36.2	36.1	36.2
Male	48.8	48.9	17.2	17.2	17.2
Rural					
Female	33.4	33.5	43.1	43.1	43.1
Male	49.7	49.8	18.6	18.5	18.6
Mexico					
Female	38.7	38.7	37.3	37.2	37.3
Male	49.0	49.1	17.5	17.5	17.5

Source: Authors' calculations based on synthetic file

The direct impact of the UEC policy on time poverty rates of the employed is relatively small (see Table 11, below). Just over half of the female recipients in urban areas and only a third in rural areas were employed. Among male recipients, about three quarters were employed, with slightly greater employment rates in the rural areas. However, among the employed that saw reductions in time use, time poverty was reduced by roughly 4 percentage points. The impact of employment on time poverty rates is notable, however: the total effect time poverty rates (this includes all those employed in the baseline, as well as those receiving jobs in the simulation) are 1.4 percentage points higher for women in rural and urban areas, as well as overall. Men saw about half a percentage point drop in time poverty rates, on the other hand. This implies that Mexican men entering paid employment are expected to do less household production work than before, while women are expected to do more. Thus, the overall impact of the UEC policy on the employed is to increase time poverty among women, while reducing it among men.

Table 11: Time Poverty Rates of Employed Persons (18–74 years of age) by Sex and Location, Baseline and Simulated

	Baseline	Direct Effect	Total Effect
Urban			
Female	57.2	57.1	58.5
Male	41.1	41.1	40.5
Rural			
Female	59.6	59.7	61.0
Male	50.1	50.0	49.6
Mexico			
Female	57.6	57.5	58.9
Male	43.1	43.0	42.4

Source: Authors' calculations based on synthetic file

We next examine the question of just how large time deficits are for time poor employed persons in Mexico and analyze the impact of the UEC implementation in time deficits (see Table 12, below). There are little to no reductions in overall average time deficits as a direct effect of the implementation of UEC. For those directly impacted (those that saw a reduction in their household production hours due to the direct impact of the policy) that are also employed, baseline time deficits are larger in rural areas for men, but smaller for women, while in rural areas they are smaller for everyone. There are also large reductions in time deficits as a direct effect of the provision of elder care. In urban areas, the reductions are about an hour and a half per week, with women seeing slightly larger reductions than men. In rural areas, the overall change is 2.7 hours per week, but men receive a larger reduction (3.1 hours per week) than women (2.4 hours per week). The further impact of employment growth increases average time deficits for employed women, while reducing them for employed men. The size of the change is also larger for women: for example, employed rural women see an increase of 1 hour per week in average time deficits, while men see a 12-minute reduction. When we consider those directly impacted by elder care, there are more obvious impacts: large increases in time deficits in urban areas (2.4 hours for women and 3.4 hours for men) and smaller increases in rural areas (0.7 and 1.1 hours per week for employed women and men, respectively). In rural areas, unlike in urban areas, the net effect of the policy is to reduce the average time deficits of the employed.

Table 12: Average Time Deficits of Time Poor Employed Persons (18-74 years of age) by sex and location (percent), Baseline and Simulated

	All Employed			**Directly Impacted Employed**		
	Baseline	Direct Effect	Total Effect	Base-line	Direct Effect	Total Effect
Urban						
Female	-25.2	-25.2	-25.8	-24.3	-22.7	-25.1
Male	-19.5	-19.5	-19.3	-26.7	-25.5	-28.9
Total	-22.4	-22.4	-22.6	-24.7	-23.2	-25.8
Rural						
Female	-29.2	-29.1	-30.1	-22.9	-20.5	-21.2
Male	-26.8	-26.9	-26.7	-26.1	-23.0	-24.1
Total	-27.7	-27.7	-28.0	-24.0	-21.3	-22.1
Mexico						
Female	-25.8	-25.8	-26.5	-24.7	-23.2	-25.8
Male	-21.4	-21.3	-21.1	-24.0	-21.3	-22.1
Total	-23.5	-23.5	-23.8	-24.4	-22.3	-24.1

Source: Authors' calculations based on synthetic file

We now turn our attention to the group that is the main target of the policy: women who live in households with disabled elders and who received a job in the simulation. We first examine shifts in time poverty status for these women (Table 13, below). First, let us note that there are just under 10,000 women in this category, and all of them reside in urban areas. Of those that were already time poor none were able to reduce their time deficits as a direct result of the implementation of universal elder care. This is because their burden of household production work alone was enough to generate time deficits for them. Given that fact, eliminating elder care responsibilities will not reduce the time poverty of these women, though it will reduce their time deficits. Indeed, for this subgroup of women, time deficits decline by two hours per week. Time deficits actually fall by a further 11 hours per week once transitioned into employment (due to the reallocation of household production time outweighing the increase in their income generating activities). A third of the women fell into time poverty as a result of employment.

Table 13: Time Poverty Rates of Newly Employed Women with Disabled Elders in Household

	Time Poverty, Baseline	
	Nonpoor	Poor
Urban		
Direct Effect	0.0%	100.0%
Total Effect	47.0%	91.7%
Rural		
Direct Effect		
Total Effect		
Mexico		
Direct Effect	0.0%	100.0%
Total Effect	47.0%	91.7%

Source: Authors' calculations based on synthetic file

The same group of women saw big improvements in time-adjusted income poverty in the simulation (see Table 14, below). Although there was no reduction due to the direct effects on time use, urban women did see a 91 percentage point drop in poverty as a result of the transition to paid employment.

Table 14: Time-Adjusted Income Poverty Rates of Newly Employed Women with Disabled Elders in Household

	Time-Adjusted Income Poverty, Baseline	
	Nonpoor	Poor
Urban		
Direct Effect	0.0%	100.0%
Total Effect	0.0%	9.2%
Rural		
Direct Effect		
Total Effect		
Mexico		
Direct Effect	0.0%	100.0%
Total Effect	0.0%	9.2%

Source: Authors' calculations based on synthetic file

We now turn our attention back to the simulated impacts of the UEC implementation for the population of Mexico in general. First addressing the changes in income

poverty, we can see that in terms of the official poverty measure, there was a decline of one half of a percentage point in both urban and rural areas (Table 15, below). Comparing the baseline official poverty rate and time-adjusted poverty rate reveals significant hidden poverty, what we call those that are not officially poor, but poor when thresholds are adjusted for time deficits. The already high rate of poverty for Mexico is 14.3 percentage points higher when adjusted for time. The hidden poverty rate in urban areas is similar to Mexico as a while, but the hidden poverty in rural Mexico is 16.2 percent (corresponding to 2.5 million adults). The direct effect of UEC provision is to slightly reduce the rate of time-adjusted poverty in rural Mexico and Mexico as a whole, by reducing the time deficits in those households that have elders that require care. The employment effects of the policy implementation reduce time-adjusted poverty even further, but to a lesser degree than is reflected in the official poverty rate because there are increases in time deficits that offset income gains in households that receive jobs. Thus, while the overall official poverty rate declines by 0.6 percentage points, the time-adjusted rate falls by just 0.3 percentage points. Thus, the rate of hidden poverty in Mexico increases by 0.2 percentage points and by 0.3 percentage points in rural areas, where time-adjusted income poverty is at 68.7 percent.

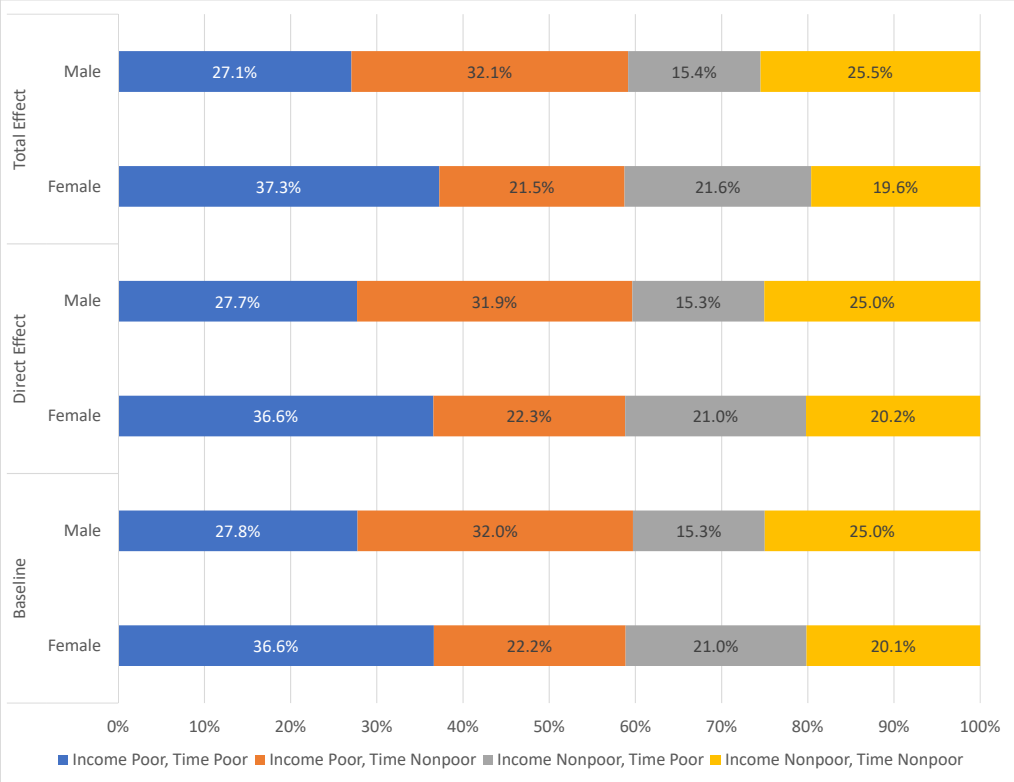
Table 15: Official and Time-Adjusted Poverty Rates of Employed Persons (18–74 years of age) by Area of Residence (percent), Baseline and Simulated

	Official		**LIMTIP**		
	Baseline	Total Effect	Baseline	Direct Effect	Total Effect
Urban	43.2%	42.7%	57.1%	57.1%	56.7%
Rural	52.7%	52.2%	68.9%	68.8%	68.7%
Mexico	45.1%	44.5%	59.4%	59.3%	59.0%

Source: Authors' calculations based on synthetic file

The four-way classification of adults by time and income poverty in the baseline, and in the simulation is presented in Figure 1, below. While income poverty rates are nearly identical between men and women time poverty rates are clearly higher. In the baseline, 36.6 percent of women are both time and income poor, while 27.8 percent of men are. The total effects reduce the share of men in both income and time poverty by 1.7 percentage points, but increases the share of women by 0.7 percentage points. Among those that are not income poor, there is no change in the time poverty rate of men, but the proportion of women in time poverty increases to 21.6 percent. Fairly consistently, one quarter of men but only one in five women are neither time nor income poor.

Figure 1: LIMTIP Classification of Individuals (Aged 18 to 74) by Sex, Baseline and Simulated

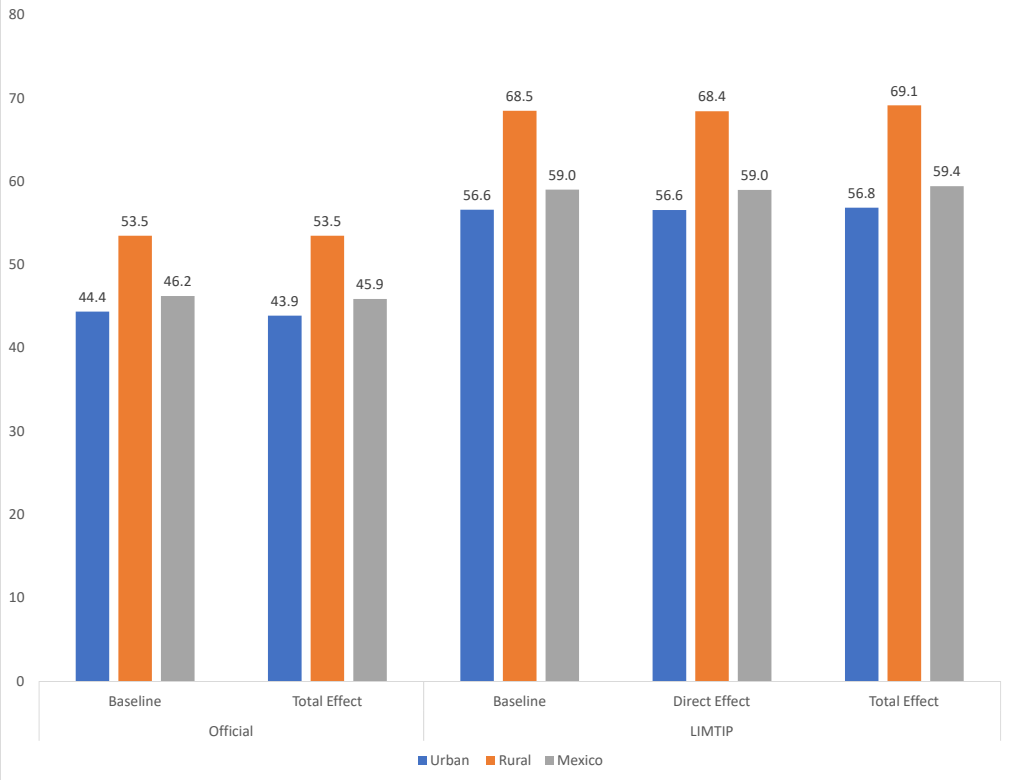


Source: Authors' calculations based on synthetic file

Turning finally to the impact of UEC provision on household income poverty (see Figure 2, below), we focus on employed households (those households where either the head or the spouse of the head is employed). We first notice that the hidden poverty rate at the household level is slightly smaller than at the individual level. This is both because official poverty as measured is higher and time-adjusted poverty is lower. These differences are both due to household composition. Poorer households are larger than nonpoor households in Mexico (an average of 3.7 compared to 3.2 individuals per household). Larger households mean more people engaged in income generation, but also more people engaged in household production work. Therefore, the average per capita income is higher, while the average time deficit is lower. The effect of the employment simulation is negligible in rural areas, according to the official measure. However, the direct effect of the policy intervention is to

slightly reduce time-adjusted poverty, while the employment effects increase it, for a net increase of 0.5 percentage points of both poverty and hidden poverty in rural areas. Official poverty declines in the simulation by 0.5 percentage points, but time-adjusted poverty increases slightly, due to the employment effect. That is to say, the replacement cost of the increased time deficits associated with transitions to paid employment outweighs the increase in earnings for urban households. Thus, hidden poverty also increases in urban areas (by 0.7 percentage points), but unlike in rural areas, this is driven more by earnings increases than by increased time deficits.

Figure 2: Rate of Income Poverty among Employed Households by Location (percent), Baseline and Simulated

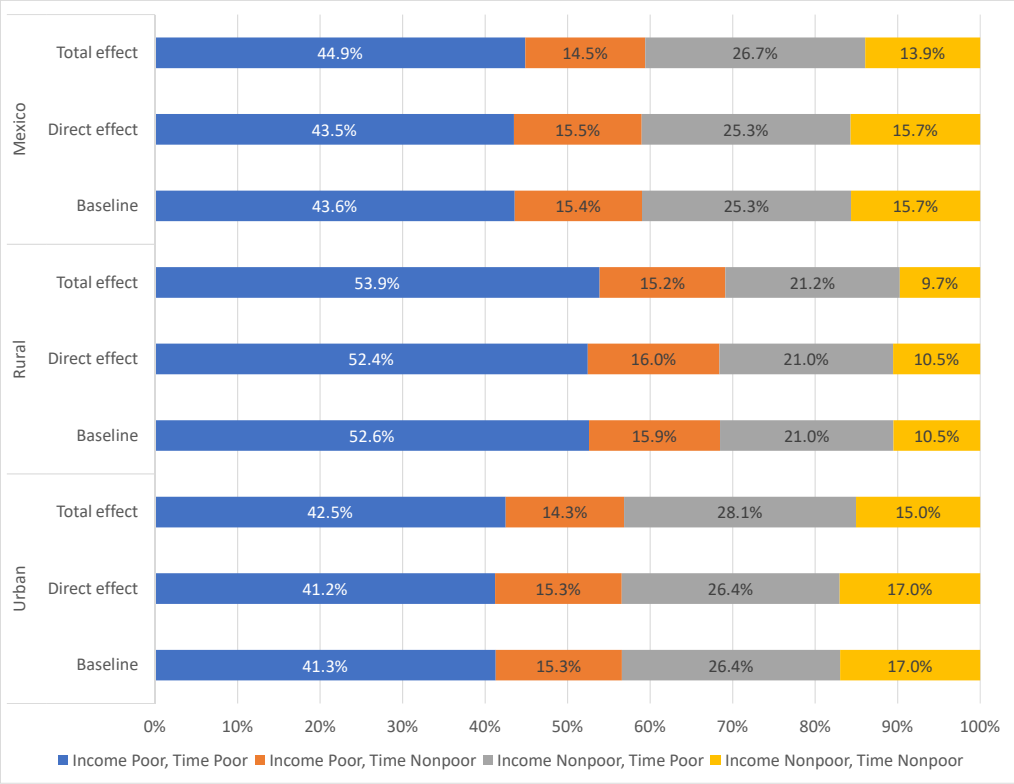


Source: Authors' calculations based on synthetic file

The four-way classification of households in terms of time and income poverty in the baseline and policy scenarios are presented in Figure 3, below. While the income poverty rates for households are more or less the same as for adults, there are greater rates of time poverty among both the income poor and nonpoor households. This is

due to the construction of the household-level time and income poverty measure: we define a time poor household as any household with at least one time poor individual. Among income poor households, time poverty rates are much lower in urban than in rural areas. However, in both areas, as in Mexico as a whole, the increased time deficits associated with the employment effect increases time poverty rates among the income poor, driving the increase in overall time-adjusted income poverty among employed households.

Figure 3: LIMTIP Distribution of Employed Households by Location (percent), Baseline and Simulated



Source: Authors' calculations based on synthetic file

We decompose changes to the number of all time-adjusted income poor households (regardless of the employment status of the household head or their spouse) in Mexico by household location in Table 16, below. Of the over 19 million poor households in Mexico, only 22 thousand are lifted out of poverty by the reductions in time deficits due to the direct effect of elder care service provision. While more than two

thirds of these households are in urban areas, rural households are over-represented in this group compared to their share of all households in Mexico. An even smaller number are added to the ranks of the income poor households, as a result of the recalculation of the thresholds for household production time. The employment effects are much larger in terms of movements in and out of time-adjusted income poverty, with nearly half a million households leaving poverty as a result of the increased employment. The number entering poverty as a result of increased time deficits is nearly as large, though a net of 98 thousand households leave income poverty. All but four thousand are urban households. The overall result is 111 thousand households leaving time-adjusted income poverty as a result of the change in employment. Nearly all of those households are in urban areas. Only 8 thousand rural households escape poverty overall. Thus, while the overall impact of the policy implementation is relatively small, its size masks multiple dynamics at play. Nearly half a million households leave, but 265 thousand enter time-adjusted income poverty. The numbers are smaller in rural areas, but again, they mask larger movements of households into and out of poverty.

Table 16: Decomposition of the Change in the Number of Income-Poor Households (in thousands) Due to Policy Intervention

Line	**Number (in thousands)**	**Urban**	**Rural**	**Mexico**
1	Number in the baseline	14,693	4,452	19,145
2	Direct effects			
3	Reduction	-16	-6	-22
4	Addition	8	2	9
5	Employment effects			
6	Reduction	-385	-68	-454
7	Addition	292	64	356
8	Total effects			
9	Total reduction: Lines 3 + 6	-402	-74	-476
10	Total addition: Line 4 + 7	300	66	365
11	Net reduction: Lines 9 + 10	-102	-8	-111
12	Number after intervention: Lines 1 + 11	14,591	4,443	19,034
Line	**Percentage of baseline**	**Urban**	**Rural**	**Mexico**
1	Number in the baseline	100.0	100.0	100.0
2	Direct effects			
3	Reduction	-0.1	-0.1	-0.1
4	Addition	0.1	0.0	0.0
5	Employment effects			
6	Reduction	-2.6	-1.5	-2.4
7	Addition	2.0	1.4	1.9
8	Total effects			
9	Total reduction: Lines 3 + 6	-2.7	-1.7	-2.5
10	Total addition: Line 4 + 7	2.0	1.5	1.9
11	Net reduction: Lines 9 + 10	-0.7	-0.2	-0.6
12	Number after intervention: Lines 1 + 11	99.3	99.8	99.4

Source: Authors' calculations based on synthetic file

7. Conclusion

The provision of social care infrastructure has benefits beyond the direct care that beneficiaries receive. In contexts like Mexico, where the overwhelming majority of the burden of care falls on families, and thus, on women, social care provision can also reduce gender inequality in terms of labor force participation, earnings, and time poverty. Further, the expansion of paid care services means additional employment

opportunities, especially for women. The simultaneous reduction of household production responsibilities and employment opportunities can greatly enhance gender equity and overall well-being. We provide a comprehensive approach to estimating the impacts of social care policies in the combination of our microsimulation framework and the measurement of time and income poverty.

The scope for reductions in time poverty is considerable. Women are the majority of individuals providing care within households that would be alleviated by both the introduction of Universal Elder Care (UEC) and the fuller implementation of Full-Time School (FTS) for primary age children. In addition, women spend more time on care activities associated with these programs than men. Women are therefore the primary beneficiaries of the time reductions provided. We showed that the average reduction in time spent on care activities affected by each program is in the area of ten hours per week, on average. The reduction in time is only one element of the impact since supervisory care is in itself a restriction not just on time but on the flexibility to fit paid work into a normal week. Those responsible for supervisory care have more restrictions on their ability to engage in paid work.

The results of our employment simulations indicate that there is an increase in women's employment rate of 0.4 percentage points in the UEC scenario, and 0.8 percentage points in the FTS scenario. In each case, the increase is concentrated in urban areas, where most of the newly employed women in both scenarios are located. These results may be due in part to data restrictions since the Input-Output model for Mexico is not disaggregated by urban/rural location. In both scenarios, younger women were more likely to be employed than older women, especially in urban areas. This is in part due to the fact that our simulation reflects the existing distribution of employment, in which younger women are in fact more likely to be employed, especially in the industries in which most of the jobs are being created. The changes in employment have little impact on the average time devoted to paid work by employed individuals, but the direct effects of the FTS policy are clear to see in the reductions in the average time spent on household production activities by the employed, especially for women. The UEC implementation does not noticeably affect the aggregate because its impact is more limited in terms of number of households.

The direct effect of social care provisioning on time use can influence the rates of time poverty we observe among employed adults (those most likely to suffer from time poverty). We do see a significant reduction in the extended school day scenario but not in the case of elder care. This follows from the direct impacts we observed on time use. In both cases, though we observed an increase in time poverty rates for employed women and a decrease for employed men, once we added the employment effect. For women, in both scenarios, the added earnings from employment for those

that gained jobs in the simulation were insufficient to outweigh the replacement cost of their increases in time deficits. The opposite was true for men. This pattern is the result of a combination of factors: the types of new jobs created that women were likely to get, primarily service jobs; and the disadvantages women face in terms of earnings in the existing labor market conditions in Mexico.

Time and/or income poor women that were both directly impacted by the policy implementation, as well as receiving new jobs as an indirect effect were estimated to be likely to leave poverty status in our simulations. In the UEC scenario, almost all of the women in this category left income poverty. However, it must be admitted that very few women (only 10 thousand) fit this description in our simulation. In the FTS scenario the improvements were much more modest, with only a few percent of income poor women with primary school-aged children receiving jobs and escaping poverty.

There were improvements in measured poverty rates, both official and LIMTIP, in both scenarios, though the impact in the UEC scenario was small and entirely due to the employment effects. The FTS simulation also provided poverty reductions from the employment effects, but unlike the UEC scenario, the direct effects produced a large reduction in LIMTIP poverty, which was augmented by the employment effects. Thus, the overall impact of the UEC on employed persons in Mexico was small in terms of time and income poverty, with little discernible impact on the aggregate situation, because less than two percent of households were directly impacted by the provision of elder care. Nearly one in three Mexican households have children that are primary school-aged, and so we see a much larger impact on the time and income poverty of employed adults in the FTS scenario. The main impact is the reduction in time poverty for employed adults, though there was also a decline in income poverty, as well.

In terms of the impacts of these policies on women's labor force engagement and overall wellbeing, we can say that the FTS policy has a much broader impact than the UEC policy. Nevertheless, both policies have important effects in terms of the time spent on household production by those individuals in directly affected households. In addition, the creation of jobs in the FTS policy scenario is more aligned with the goal of providing employment for women, if not improving gender equality. Gender pay gaps attenuate the poverty-reducing effects of the expansion of employment in the FST simulation. The presence of other care responsibilities will also reduce the ability of women to increase their labor force engagement: a woman with a three-year-old will not better be able to access paid work with a full-time school day for her primary school-aged children, if there is no childcare available for her three-year-old. Thus, the provision of universal early childhood education simulated in our

earlier report is a necessary complement for many women to increase their labor force engagement. Because women face multiple constraints on their labor force engagement, a piecemeal approach, though helpful, will not produce the desired results.

References

Addati, Laura et al. (June 2018). *Care Work and Care Jobs for the Future of Decent Work*. Tech. rep. Geneva, Switzerland: International Labour Organization. (Visited on 09/26/2024).

Amieva Gálvez, José Ramón (2015). "Visitas Domiciliarias y Programas de Apoyo a Cuidadores En La Ciudad de México." In: *Mexico-U.S.A. Workshop on Formal and Informal Systems of Support in Mexico and the U.S. in the Context of Health and Welfare Reform, Mexico City, DF.*

Angel, Jacqueline et al. (Sept. 2016). "Institutional Context of Family Eldercare in Mexico and the United States". In: *Journal of Cross-Cultural Gerontology* 31.3, pp. 327–336. ISSN: 01693816. DOI: 10.1007/s10823-016-9291-3. (Visited on 02/07/2023).

Antonopoulos, Rania and Indira Hirway, eds. (2010). *Unpaid Work and the Economy*. New York: Palgrave Macmillan. (Visited on 03/22/2022).

Bango, Julio (Dec. 2020). *"El Cuidado de Las Personas Mayores En Situación de Dependencia En México: Propuesta de Servicios, Estimación Preliminar de Costos e Identificación de Impactos Económicos"*. Tech. rep. Mexico City: ONU Mujeres.

Berg-Weger, Marla, Doris McGartland Rubio, and Susan Steiger Tebb (Nov. 2000). "The Caregiver Well-Being Scale Revisited". In: *Health & Social Work* 25.4, pp. 255–263. ISSN: 0360-7283. DOI: 10.1093/hsw/25.4.255. (Visited on 06/28/2023).

Bernabe-Ortiz, Antonio et al. (Mar. 2016). "Disability, Caregiver's Dependency and Patterns of Access to Rehabilitation Care: Results from a National Representative Study in Peru". In: *Disability and Rehabilitation* 38.6, pp. 582–588. ISSN: 0963-8288. DOI: 10.3109/09638288.2015.1051246. (Visited on 06/28/2023).

Berndt, Ernst R. (Mar. 1996). *The Practice of Econometrics: Classic and Contemporary*. Har/Dis. Addison Wesley. ISBN: 0-201-49900-2.

Blanco, Mercedes and Edith Pacheco (2009). "Aging and the Family-Work Link: A Comparative Analysis of Two Generations of Mexican Women". In: *Journal of Comparative Family Studies* 40.2, pp. 143–166. ISSN: 00472328. DOI: 10.3138/jcfs.40.2.143. (Visited on 02/07/2023).

Bolin, K., B. Lindgren, and P. Lundborg (2008). "Informal and Formal Care among Single-Living Elderly in Europe". In: *Health Economics* 17.3, pp. 393–409. ISSN: 1099-1050. DOI: 10.1002/hec.1275. (Visited on 06/28/2023).

Bookman, Ann and Mona Harrington (Dec. 2007). "Family Caregivers: A Shadow Workforce in the Geriatric Health Care System?" In: *Journal of Health Politics, Policy and Law* 32.6, pp. 1005–1041. ISSN: 03616878. (Visited on 01/23/2023).

Burniaux, Jean-Marc, Romain Duval, and Florence Jaumotte (June 2004). *Coping with Ageing: A Dynamic Approach to Quantify the Impact of Alternative Policy Options on Future Labour Supply in OECD Countries*. Tech. rep. Paris: OECD. DOI: 10.1787/224538175006. (Visited on 06/28/2023).

Carmichael, F., S. Charles, and C. Hulme (Jan. 2010). "Who Will Care? Employment Participation and Willingness to Supply Informal Care". In: *Journal of Health Economics* 29.1, pp. 182–190. ISSN: 01676296. DOI: 10.1016/j.jhealeco.2009.11.003. (Visited on 06/28/2023).

Carmichael, Fiona and Sue Charles (Dec. 1998). "The Labour Market Costs of Community Care". In: *Journal of Health Economics* 17.6, pp. 747–765. ISSN: 01676296. DOI: 10.1016/S0167-6296(97)00036-2. (Visited on 06/28/2023).

Carmichael, Fiona and Susan Charles (Sept. 2003). "The Opportunity Costs of Informal Care: Does Gender Matter?" In: *Journal of Health Economics* 22.5, pp. 781–803. ISSN: 0167-6296. DOI: 10.1016/S0167-6296(03)00044-4. (Visited on 06/28/2023).

Casado-Marín, David, Pilar García-Gómez, and Ángel López-Nicolás (Mar. 2011). "Informal Care and Labour Force Participation among Middle-Aged Women in Spain". In: *SERIEs* 2.1, pp. 1–29. ISSN: 1869-4195. DOI: 10.1007/s13209-009-0008-5. (Visited on 06/28/2023).

Ciani, Emanuele (Apr. 2012). "Informal Adult Care and Caregivers' Employment in Europe". In: *Labour Economics* 19.2, pp. 155–164. ISSN: 09275371. DOI: 10.1016/j.labeco.2011.12.001. (Visited on 06/28/2023).

CISS (2005). *The Americas Social Security Report 2006*. Tech. rep. Mexico City: Inter-American Conference on Social Security/CISS.

Crespo, Laura and Pedro Mira (Oct. 2014). "Caregiving to Elderly Parents and Employment Status of European Mature Women". In: *The Review of Economics and Statistics* 96.4, pp. 693–709. ISSN: 0034-6535. DOI: 10.1162/REST_a_00426. (Visited on 06/28/2023).

Elson, Diane (2017). "Recognize, Reduce, and Redistribute Unpaid Care Work: How to Close the Gender Gap". In: *New Labor Forum* 26.2, pp. 52–61. ISSN: 1095-7960. JSTOR: 26420070. (Visited on 06/28/2023).

Esquivel, Valeria (Oct. 2011). *The Care Economy in Latin America: Putting Care at the Centre of the Agenda*. ISBN: 978-9962-663-15-7.

Ettner, Susan L. (Feb. 1995). "The Impact of "Parent Care" on Female Labor Supply Decisions". In: *Demography* 32.1, pp. 63–80. ISSN: 0070-3370, 1533-7790. DOI: 10.2307/2061897. (Visited on 06/28/2023).

— (1996). "The Opportunity Costs of Elder Care". In: *Journal of Human Resources* 31.1, pp. 189–205. ISSN: 0022166X. (Visited on 01/23/2023).

Feinberg, Lynn Friss (2004). "Caregiving on the Public Policy Agenda". In: *Always on Call: When Illness Turns Families into Caregivers*. Ed. by Carole Levine. Nashville: Vanderbilt University Press, pp. 193–207. ISBN: 978-0-8265-1461-5.

Ferrant, Gaëlle, Luca Maria Pesando, and Keiko Nowacka (2014). "Unpaid Care Work: The Missing Link in the Analysis of Gender Gaps in Labour Outcomes". In.

Flores-Castillo, Atenea (Mar. 2012). *Cuidado Y Subjetividad. Una Mirada a La Atención Domiciliaria (Care and Subjectivity. A Look at Care at Home)*. SSRN Scholarly Paper. Rochester, NY. (Visited on 06/28/2023).

Folbre, Nancy (July 2006). "Measuring Care: Gender, Empowerment, and the Care Economy". In: *Journal of Human Development* 7.2, pp. 183–199. ISSN: 1464-9888. DOI: 10.1080/14649880600768512. (Visited on 06/28/2023).

Folbre, Nancy and Susan Himmelweit (Jan. 2000). "Introduction - Children and Family Policy: A Feminist Issue". In: *Feminist Economics* 6.1, pp. 1–3. ISSN: 1354-5701, 1466-4372. DOI: 10.1080/135457000337633. (Visited on 06/28/2023).

Garey, Anita Ilta et al. (Sept. 2002). "Care and Kinship: An Introduction". In: *Journal of Family Issues* 23.6, pp. 703–715. ISSN: 0192-513X. DOI: 10.1177/0192513X02023006001. (Visited on 06/28/2023).

Gitlin, L. N. et al. (Oct. 2006). "Enhancing Quality of Life of Families Who Use Adult Day Services: Short- and Long-Term Effects of the Adult Day Services Plus Program". In: *The Gerontologist* 46.5, pp. 630–639. ISSN: 0016-9013, 1758-5341. DOI: 10.1093/geront/46.5.630. (Visited on 06/28/2023).

Gomes da Conceicao, Cristina and Veronica Montes de Oca (2004). "Ageing in Mexico: families, informal care and reciprocity". In: *Living longer : ageing, development and social protection*. Ed. by Peter Lloyd-Sherlock. London ; New York: Zed Books.

Gutiérrez Robledo, Luis Miguel, Mariana López Ortega, and Victoria Eugenia Arango Lopera (Dec. 2012). "The State of Elder Care in Mexico". In: *Current Geriatrics Reports* 1.4, pp. 183–189. ISSN: 2196-7865. DOI: 10.1007/s13670-012-0028-z. (Visited on 06/08/2022).

Hakkert, Ralph and Jose Miguel Guzmán (2004). "Envejecimiento Demográfico y Arreglos Familiares de Vida En América Latina [Demographic Aging and Family Life Arrangements in Latin America]". In: *Imágenes de La Familia En El Cambio de Siglo*. Ed. by Marina Ariza and Orlandina de Oliveira. Mexico City: Universidad Autonomo de Mexico Instituto de Investigaciones Sociales, pp. 479–518.

Heitmueller, Axel (May 2007). "The Chicken or the Egg?" In: *Journal of Health Economics* 26.3, pp. 536–559. ISSN: 01676296. DOI: 10.1016/j.jhealeco.2006.10.005. (Visited on 06/28/2023).

Hooyman, Nancy R. and Judith Gonyea (Aug. 1995). *Feminist Perspectives on Family Care*. SAGE. ISBN: 978-0-8039-5143-3.

Ibarra, Carlos A. and Jaime Ros (Oct. 2019). "The Decline of the Labor Income Share in Mexico, 1990–2015". In: *World Development* 122, pp. 570–584. ISSN: 0305-750X. DOI: 10.1016/j.worlddev.2019.06.014. (Visited on 09/11/2023).

INEGI (2014). *Estadísticas a Propósito Del Día Internacional de Las Personas de Edad*. Tech. rep. Aguascalientes, Mexico: Instituto Nacional de Geografía y Estadística (INEGI).

Jackson, Richard, Rebecca Strauss, and Neil Howe (Mar. 2009). *Latin America's Aging Challenge: Demographics and Retirement Policy in Brazil, Chile, and Mexico*. Tech. rep. Center for Strategic and International Studies. (Visited on 06/28/2023).

Lee, Jo Ann, Matthew Walker, and Richard Shoup (2001). "Balancing Elder Care Responsibilities and Work: The Impact on Emotional Health". In: *Journal of Business and Psychology* 16.2, pp. 277–289. ISSN: 0889-3268. JSTOR: 25092769. (Visited on 06/28/2023).

Lloyd-Sherlock, Peter et al. (Apr. 2018). "Allocating Family Responsibilities for Dependent Older People in Mexico and Peru". In: *Journal of Development Studies* 54.4, pp. 682–701. ISSN: 00220388. DOI: 10.1080/00220388.2017.1308489. (Visited on 02/07/2023).

López Ortega, Mariana and Javier Enrique Jiménez Bolón (2014). "Dependencia y Cuidados de Largo Plazo [Dependency and Long-Term Care. Aging and Dependency. Realities and Forecast for the Coming Years]." In: *Envejecimiento y Dependencia. Realidades y Previsión Para Los Próximos Años*. Ed. by Luis Miguel F. Gutiérrez Robledo, Maria del Carmen Garcia Pena, and Javier Enrique Jiménez Bolón. Mexico City: Academia Nacional de Medicina, pp. 29–62.

Martire, Lynn M. and Mary Ann Parris Stephens (Feb. 2003). "Juggling Parent Care and Employment Responsibilities: The Dilemmas of Adult Daughter Caregivers in the Workforce". In: *Sex Roles* 48.3, pp. 167–173. ISSN: 1573-2762. DOI: 10.1023/A:1022407523039. (Visited on 06/28/2023).

Masterson, Thomas et al. (June 2022). *Assessing the Impact of Childcare Expansion in Mexico: Time Use, Employment, and Poverty*. Research Project Report. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College. (Visited on 07/13/2022).

Mayston, Rosie et al. (Aug. 2017). "A Journey without Maps—Understanding the Costs of Caring for Dependent Older People in Nigeria, China, Mexico and Peru". In: *PLoS ONE* 12.8, pp. 1–17. ISSN: 19326203. DOI: 10.1371/journal.pone.0182360. (Visited on 02/07/2023).

Miller, Dorothy A. (1981). "The 'sandwich' Generation: Adult Children of the Aging". In: *Social Work* 26.5, pp. 419–423. ISSN: 0037-8046. JSTOR: 23712207. (Visited on 06/28/2023).

Miller, Ronald E. and Peter D. Blair (Jan. 2022). *Input-Output Analysis: Foundations and Extensions*. Cambridge University Press. ISBN: 978-1-108-67621-2.

Moen, Phyllis, Julie Robison, and Vivian Fields (July 1994). "Women's Work and Caregiving Roles: A Life Course Approach". In: *Journal of Gerontology* 49.4, S176–S186. ISSN: 0022-1422. DOI: 10.1093/geronj/49.4.S176. (Visited on 06/28/2023).

Monkkonen, Paavo (Sept. 2011). "The Housing Transition in Mexico: Expanding Access to Housing Finance". In: *Urban Affairs Review* 47.5, pp. 672–695. ISSN: 1078-0874. DOI: 10.1177/1078087411400381. (Visited on 06/28/2023).

Montes de Oca, Veronica (2004). "Envejecimiento y Protección Familiar En México: Límite Del Apoyo En El Interior Del Hogar [Aging and Family Protection in Mexico: Limits and Potential of Support within the Home]". In: *Imágenes de La Familia En El Cambio de Siglo*. Ed. by Marina Ariza and Orlandina de Oliveira. Mexico City: Universidad Autonomo de Mexico Instituto de Investigaciones Sociales, pp. 519–563.

Neal, Margaret B. (Feb. 1993). *Balancing Work and Caregiving for Children, Adults, and Elders*. SAGE. ISBN: 978-0-8039-4282-0.

Pavalko, E. K. and J. E. Artis (July 1997). "Women's Caregiving and Paid Work: Causal Relationships in Late Midlife". In: *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 52B.4, S170–S179. ISSN: 1079-5014, 1758-5368. DOI: 10.1093/geronb/52B.4.S170. (Visited on 06/28/2023).

Razavi, Shahra (2007). "The Return to Social Policy and the Persistent Neglect of Unpaid Care". In: *Development and Change* 38.3, pp. 377–400. ISSN: 1467-7660. DOI: 10.1111/j.1467-7660.2007.00416.x. (Visited on 06/28/2023).

— (2011). "Rethinking Care in a Development Context: An Introduction". In: *Development and Change* 42.4, pp. 873–903. ISSN: 1467-7660. DOI: 10.1111/j.1467-7660.2011.01722.x. (Visited on 06/29/2023).

Robles, Leticia (2000). "La Designación de Cuidadoras de Padres Enfermos: La Ultimogenitura Femenina En Un Sector Popular Urbano de Guadalajara". In: *Familias Mexicanas En Transición: Unas Miradas Antropológicas*. Ed. by David Robichaux. Mexico City: Universidad Iberoamericana. (Visited on 06/29/2023).

Rossel, Cecilia (June 2016). "Desafíos demográficos para la organización social del cuidado y las políticas públicas". In: (visited on 06/28/2023).

Skira, Meghan M. (Feb. 2015). "Dynamic Wage and Employment Effects of Elder Parent Care". In: *International Economic Review* 56.1, pp. 63–93. ISSN: 00206598. (Visited on 01/23/2023).

Van Gameren, Edwin and Durfari Velandia Naranjo (Nov. 2015). "Working and Caring: The Simultaneous Decision of Labor Force Participation and Informal Elderly and Child Support Activities in Mexico". In: *Latin American Journal of Economics* 52.2, pp. 117–148. ISSN: 07190425. DOI: 10.7764/LAJE.52.2.117.

Varley, Ann and Maribel Blasco (2000). "Intact or in Tatters? Family Care of Older Women and Men in Urban Mexico". In: *Gender and Development* 8.2, pp. 47–55. ISSN: 1355-2074. JSTOR: 4030473. (Visited on 06/28/2023).

Vega, William A. et al. (Mar. 2015). *Challenges of Latino Aging in the Americas*. Springer. ISBN: 978-3-319-12598-5.

World Bank (2023). *Consumer Price Index for Mexico*. (Visited on 08/11/2023).

A. Direct Effects Modeling of Universal Elder Care

The universal elder care program is still at the policy proposal stage. Currently elder care is provided mostly by households with elders themselves, with some privately-run elder care facilities providing care for those families that can afford it. The ambitious proposal outlined in Bango (2020) would provide an array of publicly provided elder care options, from personal assistants and services provided via the internet to in-patient elder care and hospice services. Given the enormous complexity of the proposed policy, we have imposed some simplifying assumptions into the estimations of the impact.

We first assume that universal eldercare provision should eliminate the components of caring labor that the fellow household members of elders requiring assistance currently do. We further assume that there is complete uptake of the available program options. Thus, our estimates of the impact of the universal provision of elder care services should be considered as upper bound estimates. The actual experiences of households would in fact vary and there would in many cases be a smaller impact in terms of time spent on care of the elderly in practice.

Our procedure is to estimate a model of the time spent on care for the elderly members of households with a measure of the number of elders that require care as an explanatory variable. The model is run on time use data from the 2019 ENUT. With the results of the model, we then reduce the amount of adult care done in households with disabled elders by the product of the estimated coefficient on our policy variable (the number of elders in the household that require care) and the variable itself.

A.1. Implementation

The 2019 ENUT asks all adults in each household whether they have any conditions that make assistance from others a necessity (chronic or temporary illness, and mental or physical disabilities). This allows us to identify the households that have such members that are also elders as well as the number in each household. In addition, the time use module asks each individual how much time they spent in the prior week on eleven different tasks related to the care of elders, including supervisory care. Thus, we can identify the amount of time spent by each individual on the care of elders. Thus our model specification for the direct impact of universal elder care provision on time use is:

$$time_i^{ac} = \alpha_0^{ac} + \alpha_1^{ac} NumEldersRC_r + X_i\beta + e_i \tag{1}$$

Where $time_i^{ac}$ is the amount of time spent by individual i on adult care, $NumEldersRC_r$ is the number of elders requiring care in household r, and X_i is a vector of other household and individual characteristics (sex, age, and employment status of the individual, an indicator for household head, the number of elders, number of children under five, between six and twelve, and aged 13 or 14, the number of adults, and the rural or urban location of the household). We run the model separately for the two strata of the ENUT (tradicional and indigena). In traditional households, we find that an additional elder requiring care increases the amount of time spent by individuals on adult care by nearly ten hours, whereas its under 8 hours for Indigenous households. This implies that the time-use impacts of the universal provision of eldercare will be important for those households and individuals that currently provide this care.

Table A1: The Estimated Impact of Universal Elder Care on Time Use

	Tradicional	Indigena
Number of Elders Requiring Care	9.890***	7.642***
	(0.613)	(1.432)
N	16086	2481

Note: Other controls omitted.
Standard errors in parentheses
*p ¡ 0.1, ** p ¡ 0.05, *** p ¡ 0.01*

B. Input Output Model of Employment Impacts of Social Care Expansion

B.1. Methodology

We use input-output (IO) analysis to estimate the total employment effects of additional public expenditure associated with the provision of universal elder care in Mexico. An IO matrix is a $n \times n$ square matrix that provides a detailed description of the economy, comprising all intersectoral transactions. A given column representing a specific industry shows the various purchases of inputs that it makes from the other industries to produce its output, while the corresponding row shows its sales of output to the other industries. IO analysis enables the estimation of the impact of one unit increase in the output of a particular industry on the output and employment of all industries.

We estimate the total employment effects, which include direct, indirect, and induced effects. Direct effects refer to the increase in employment in the industries

that experience the initial increase in final demand as a result of the intervention. Indirect effects capture the increase in employment because the industries faced with the initial increase in final demand invariably require intermediate inputs from other industries, which, in turn, require intermediate inputs from various industries and so on. The increase in gross output triggered by these "backward linkages" creates an additional "indirect" impetus to employment. Finally, induced effects refer to the rise in employment that would accompany the rise in gross output required to meet the higher consumption demand for various commodities due to the higher household incomes generated by the direct and indirect effects.

The standard method of calculating the total effects described above begins by augmenting the standard matrix of technical coefficients with a "household industry" that supplies labor services, now considered an intermediate input, to various industries Miller and Blair 2022, pp. 35–42. The row in the matrix representing the industry will display the outlays on the labor (or labor income) required to produce a peso's worth of gross output of the various industries listed in the columns. Symmetrically, the new industry is assumed to consume the products of different industries, now considered as intermediate inputs that "produce" the labor services but previously appearing as acts of private consumption (a component of final demand). The household industry's column will, thus, display the shares of various industries, listed in the rows, in the total private consumption of households. We denote the augmented matrix as $\bar{A}$, which is a square matrix of order $(n+1) \times (n+1)$, with the household industry represented in its $n+1$ row and $n+1$ column, while the ordinary industries are represented in the remaining n columns and rows.

We evaluate the employment effects of additional public expenditure associated with universal elder care. Let the additional expenditure associated with the policy intervention be denoted as $\Delta\mathbf{y}$, representing the $((n+1) \times 1)$ vector of changes in final demand with zeros everywhere but for the 4-digit industries in which additional demand is generated.

With the assumption of constant "technology" (which now includes rates of labor remuneration and household budget shares), we can calculate the change in gross output due to the increase in the final demand for schooling or elder care as

$$\Delta x = (I - \bar{A})^{-1} \Delta y \tag{2}$$

where Δx is the $((n+1) \times 1)$ vector of changes in gross output. The assumption of constant technology also implies that labor requirements remain unchanged. When we combine this with the assumption of constant rates of labor remuneration, it follows that the changes in labor income (and employment) will be proportional to the changes in gross output. Let ϵ_j indicate the amount of labor income per peso

of gross output in industry j and w_j indicate the total amount of labor income in industry j. We define an $(n+1) \times (n+1))$ diagonal matrix $\hat{\epsilon}$ so that $\hat{\epsilon}_{ij} = \hat{\epsilon}_j$ when $i = j$ and $\hat{\epsilon}_{ij} = 0$ when $i \neq j$. Letting Δw denote the vector of changes in labor income, we can then write:

$$\Delta w = \hat{\epsilon}\Delta x = \hat{\epsilon}(I - \bar{A})^{-1}\Delta y \tag{3}$$

The proportionality between changes in labor income and changes in employment (due to the assumption of the constant rate of labor remuneration) can be expressed as:

$$\dot{e}_j = \dot{w}_j \tag{4}$$

where e_j represents the level of employment in industry j, $\dot{e}_j = \Delta e_j)/e_j$ and $\dot{w}_j = \Delta w_j/w_j$.

B.2. Empirical implementation

We use the most recent input-output (IO) data available for Mexico from 2013 provided by the Instituto Nacional de Estadística y Geografía (INEGI). The Mexican IO table consists of 262 industries at 4-digit level (or 23 industries at 2-digit level) and includes data on gross output, final demand and its major components, value added, and compensation of employees. Supplementary data on total employment (including separate estimates for wage/salaried and self-employed jobs) are also included in the table for all the 262 industries. We assume that the proposed policy interventions will initially lead to an expansion in the final demand of certain 4-digit industries included in the IO table (Table B1, below).

Table B1: Increase in final demand by industry

Industry code	2-digit industry name	Additional demand from public expenditure (million pesos)
2211	Generación, transmisión y distribución de energía eléctrica	4,621
2362	Edificación no residencial	65,450
3342	Fabricación de equipo de comunicación	69
4854	Transporte escolar y de personal	1,296
5191	Otros servicios de información	163
6233	Asilos y otras residencias para el cuidado de ancianos	32,634
7225	Servicios de preparación de alimentos y bebidas / alcohólicas y no alcohólicas	7,204
Total		111,437

Source: Authors calculations based on Bango (2020).

In estimating the employment impacts, we used technical coefficients that exclude imported intermediate inputs[8], i.e., the technical coefficient a_{ij} is calculated by dividing the total domestically supplied intermediate inputs of industry i used in the production of industry j with the gross output of j. Similarly, we also defined the consumption coefficients of the household industry as shares in the private consumption of domestically produced output. This is because we want to estimate the multiplier effects of the increase in effective demand for domestic industries, not the rest of the world.

We also used an expanded definition of labor income rather than employee compensation in calculating the household industry's labor income coefficients described above. We added imputed earnings of the self-employed to the compensation of employees to obtain our expanded definition (see, e.g., Ibarra and Ros (2019)). The labor income of the self-employed was imputed using the estimates of average employee compensation and the number of self-employed.[9] As noted above, both pieces of information were available as supplementary information to the main input-output

[8]We used the technical coefficients matrix (MIP 57) titled "Sistema de Cuentas Nacionales de México. Matriz de insumo producto 2013. Matriz simétrica de insumo producto. Industria por industria/ Economía total / Origen doméstico coeficientes técnicos/ Rama SCIAN"

[9]Employment numbers were converted into millions to calculate the average employee compensation and income of self-employed because the compensation numbers were in million pesos.

transactions table.[10] We impute the labor income of the self-employed by multiplying the average employee compensation with the number of self-employed.[11] Our estimates showed that 9.3 percent of total employment consisted of the self-employed.

Next, to calculate the total changes in employment via direct, indirect and induced effects, we construct the augmented technical coefficient matrix ($\bar{A}$) by "closing" the original technical coefficient matrix (A) using the household industry. We first drop the row and column that corresponds to industry 8141–'Hogares con empleados domésticos' (households with domestic employees)–from the technical coefficients matrix A. As per the standard IO accounting convention, this industry does not supply any intermediate inputs, nor does it purchase any intermediate inputs from other industries. The only positive entry for this industry is where its own column and row intersect and represents the employee compensation of domestic employees. We then insert household industry into the table as the last row and last column. Intermediate inputs used by the household industry from other industries are captured in the column of the newly added household industry. These are the shares of private consumption of industry i in total household consumption, including that of the industry "household with domestic employees" placed at the intersection of the row and column corresponding to the new industry. For each i, the coefficient is c_i/C, where c_i is the private consumption of industry i and C is total private consumption. We obtain the c_i values and total private consumption from the main IO transactions table.

Next, we add the row corresponding to the new industry. As explained earlier, each column in this row is obtained by dividing the labor compensation (including the imputed labor income of the self-employed) by the gross output of the industry listed in the column heading. That is, the row represents a set of labor income coefficients, ϵ_i/x_i, where x_i is the gross output of industry i and ϵ_i indicates the amount of total labor income, including the imputed earnings of self-employed, in industry i. We exclude the industry "household with domestic employees" from the calculation of labor income coefficients because what we earlier considered as the purchase of household industry from itself equals the employee compensation of domestic employees.

While our technical and labor income coefficients are for the year 2013, the changes

[10] We used the IO table (MIP 53) titled "Sistema de Cuentas Nacionales de México. Matriz de insumo producto 2013. Matriz simétrica de insumo producto. Industria por industria/ Economía total / Origen doméstico/ Rama SCIAN/ Millones de pesos a precios básicos."

[11] The self-employed category includes Personal suministrado por otra razón social (PSORS) (Contractors) and Personal por honorarios o comisiones s/sueldo (PHOCSS) (Staff for fees or commissions w/o salary).

in final demand are in 2019 prices. To address this problem, we converted the changes in final demand to 2013 pesos, i.e., we deflated the extra spending in the industries associated with universal elder care provision by $(1+\pi)$, where π is the inflation rate between 2013 and 2019 and is equal to 27 percent World Bank 2023.[12]

Once we have the Leontief inverse for the augmented matrix and the changes in final demand in the two policy scenarios, we calculate the changes in output corresponding to each scenario using equation 2. Next, we diagonalize the labor income coefficients vector and calculate the changes in total labor income by industry using equation 3.

Note that the vector of changes in labor income has in its last row the overall change in labor income of the household industry, denoted by $\Delta w_{n+1,13}$. We can derive the change in labor income in the industry 8141 as

$$\Delta w_{8141,13} = \Delta w_{n+1,13} - \sum_{j=1}^{n} \Delta w_{j,13} \tag{5}$$

Thereafter, we calculate the proportionate changes in labor income[13] $\dot{w}_j$, for all industries including industry 8141. These in turn are equal to the proportionate changes in employment, $\dot{e}_j$.

Finally, for the purposes of microsimulation (See Appendix C), we had to use a higher level of industrial aggregation than in the I-O table. The proportionate changes in employment estimated by the I-O model are at the level of 4-digit industry. We aggregated these changes to the proportionate change at the two-digit level as a weighted average with the employment shares of the 4-digit industries in the two-digit industry's total employment acting as weights. Further, for 2019, we assume that the proportionate changes in employment at the two-digit industry level are the same as those estimated for 2013.

$$\dot{e}_{j,19} = \dot{e}_{j,13} = \sum_{k=1}^{K_j} \dot{e}_{jk,13} s_{jk,13} \tag{6}$$

[12] We calculated the inflation rate using consumer price index (CPI) sourced from the World Bank database. The values of the index were 111.8 and 141.5 in 2013 and 2019, respectively.

[13] We use proportionate changes in labor income instead of proportionate changes in output for two reasons– i) to calculate the changes in labor income (and thereby employment) in industry 8141 as in equation 5, which we cannot derive from changes in output vector and ii) for the industry 2222 - Suministro de gas por ductos al consumidor final (pipeline gas supply to the final consumer) there is no wage employment and therefore zero labor income resulting in labor coefficient equal to zero. Using the proportionate change in output (¿0) for this industry would overestimate the employment change. For all other industries the proportionate changes in output are identical to the proportionate changes in labor income.

where the subscripts "19" and "13" refer to the years 2019 and 2013; j indicates the 2-digit industry; jk indicates the 4-digit industry and the total number of 4-digit industries in j is K_j; and $s_{jk,13} = e_{jk,13}/e_{j,13}$.

While calculating the proportionate changes in employment at the 2-digit level we include the industry 8141 and exclude the change captured by the overall household industry because the effect of the latter is already distributed among other industries and including it will result in double counting. Appendix Table B2 presents the absolute and proportionate employment changes at the 2-digit level in 2013.The proportionate changes in employment calculated using equation 6 represents the total changes due to direct, indirect and induced effects. Next, we use these proportionate changes in employment in 2019 and the employment levels from ENIGH (2020) to calculate the changes in the level of employment at the 2-digit level.

Table B2: Proportionate and absolute changes in employment by scenario and industry, 2013

Industry code	2-digit industry	Proportionate change (%)	Absolute change
11	Agriculture, Forestry, Fishing and Hunting	0.34	9,513
21	Mining	1.12	3,984
22	Utilities	1.26	2,770
23	Construction	3.49	158,582
31	Manufacturing - Food and Apparel	0.39	8,258
32	Manufacturing - Wood, Chemical, and Plastics	1.00	12,361
33	Manufacturing - Metal, Machinery, and Equipment	0.32	9,828
43	Wholesale trade	0.48	5,168
46	Retail trade	0.53	24,076
48	Transportation	0.56	12,046
49	Postal services and warehousing	0.56	1,145
51	Information	0.60	1,665
52	Finance and Insurance	0.52	2,461
53	Real Estate and Rental and Leasing	0.49	2,636
54	Professional, Scientific, and Technical Services	0.54	3,635
55	Management of Companies and Enterprises	0.52	178
56	Administrative and Support Services	0.69	31,419
61	Educational Services	0.10	2,417
62	Health Care and Social Assistance	13.59	158,579
71	Arts, Entertainment, and Recreation	0.41	923
72	Accommodation and Food Services	1.84	30,003
81	Other Services (except Public Administration)	0.49	16,654
93	Public Administration	0.00	76
	Total	1.23	498,376

Source: Authors' calculations

Further, we calculate the direct and indirect employment effects (combined) in a similar manner, but by using the standard technical coefficient matrix instead of the augmented matrix. Using the associated Leontief inverse and the change in demand we calculate the changes in output by industry using equation 2. The constant technology assumption implies that the change in employment by industry will be proportional to the change in gross output by industry. Let l_j indicate the amount of labor input per million pesos of gross output in industry j. We define a $(n+1)\times(n+1)$ diagonal matrix $\hat{L}$ so that $\hat{L}_{ij} = l_j$ when $i = j$ and $\hat{L}_{ij} = 0$ when $i \neq j$. The changes in employment, N, can be estimated as

$$\Delta N = \hat{L}\Delta x = \hat{L}(I - \bar{A})^{-1}\Delta y \tag{7}$$

Next, we calculate the proportionate changes in employment, $\dot{e}_j$ as

$$\dot{e}_{j,13} = \Delta N_{j,13}/N_{2013} \tag{8}$$

Further, using equation 6 we obtain the proportionate changes in employment at 2-digit level in 2019. Finally, we use these proportionate changes and the employment levels from ENIGH (2020) to calculate the *changes in the level of employment* due to *direct and indirect* effects at the 2-digit level.

We find the induced employment effect as a residual i.e., by deducting the sum of direct and indirect employment created in one industry from the total employment created in that industry. Table B3 presents the total, direct and indirect, and induced employment effects for the provision of universal elder care. Induced employment generation constitutes 22 percent of the total employment generation, so that jobs are mainly created via direct and indirect effects.

Table B3: Change in employment by type of job creation and industry, 2019

Industry code	2-digit industry	Total	Direct and Indirect	Induced
11	Agriculture, Forestry, Fishing and Hunting	25,837	3,410	22,427
21	Mining	2,150	2,073	77
22	Utilities	3,160	2,630	530
23	Construction	160,899	159,845	1,055
31	Manufacturing- Food and Apparel	14,394	1,534	12,859
32	Manufacturing - Wood, Chemical, and Plastics	17,408	13,709	3,698
33	Manufacturing - Metal, Machinery, and Equipment	11,569	7,109	4,460
43	Wholesale trade	7,360	5,695	1,665
46	Retail trade	47,717	11,697	36,020
48	Transportation	12,487	4,916	7,571
49	Postal services and warehousing	1,412	703	709
51	Information	2,930	1,350	1,580
52	Finance and Insurance	2,935	825	2,109
53	Real Estate and Rental and Leasing	1,784	339	1,444
54	Professional, Scientific, and Technical Services	7,460	4,314	3,146
55	Management of Companies and Enterprises	55	25	30
56	Administrative and Support Services	13,400	8,290	5,110
61	Educational Services	2,546	11	2,535
62	Health Care and Social Assistance	227,194	225,350	1,844
71	Arts, Entertainment, and Recreation	1,602	8	1,594
72	Accommodation and Food Services	76,180	59,913	16,268
81	Other Services (except Pub. Admin.)	26,484	4,586	21,898
93	Public Administration	66	6	60
	Total	667,030	518,340	148,690
	Share in total employment generation (%)	100	78	22

Source: Authors' calculations.

C. Employment Simulation of Universal Elder Care

In order to estimate the overall effect of the proposed policy intervention, we must consider the employment effects of the additional spending on universal elder care, as well as the changes in time use patterns among households that receive new paid employment as a result. An increase in employment can have counteracting impacts on household wellbeing. Additional income can lift poor households out of income poverty, but the additional hours spent on income-generating activities can increase time deficits within the household and thus lower well-being. The overall direction of these impacts will depend on labor market conditions, as well as household and individual characteristics. In order to estimate these impacts, we implement a multi-part microsimulation model.

The steps required to produce the estimates are as follows. First, we must identify the pool of potential job recipients for the new employment indicated in our Input-Output analysis based on the aggregate spending reported by Bango 2020. Since the IO model produces employment changes by industry, we estimate the occupational structure for each industry by using the existing distribution in the ENIGH. Then for each individual in the recipient pool, we must impute a number of characteristics to be used to match them with a new job: their likelihood of being employed; their most to least likely industry and occupation of employment; the wages they are likely to receive; and the number of hours they are likely to work. Once we have the necessary information, we perform a hot-deck statistical matching procedure to match each of the potential job recipients with the jobs indicated by the macro analysis. This process continues until all jobs are assigned. We move on to reassign household production time for each adult in the households that contain job recipients with another hot-decking statistical matching procedure. Finally, we check that the results are plausible. We provide methodological details for each step below followed by the results for each step.

C.1. Data and Methodology

The base data set for the microsimulations presented in this appendix is the synthetic dataset created for the estimation of the LIMTIP for Mexico (the match is documented in Masterson et al. (2022)). We modify this dataset as described in Appendix A, above, in order to capture the direct effects of the expansion of elder care services and full-time school on the hours spent each week on household production by individuals.

We begin with the output of the IO analysis described in Appendix B, above, which gives us a vector of employment changes by 23 two-digit industries for each policy scenario, representing the direct, indirect and induced employment effects of the spending in each case. We then apply the existing occupational structure of employment for 9 one-digit occupational categories in each industry (as found in the ENIGH 2020). This yields a matrix of new jobs by industry and occupation for each scenario.

To assign the jobs we use a hot-decking statistical matching procedure. We will describe the latter below, but first we will outline the preparation for this matching procedure. We first identify potential job recipients. These potential recipients are those adults aged 18 to 74 that are not currently working for pay, not retired or in school, and not physically disabled. Next, we identify donor records within the same data set, because we will be assigning actually existing sets of job characteristics (in-

dustry, occupation, earnings and hours) to new job recipients. For all recipients and donors, we rank industries by the likeliness of being employed within them by running a multinomial probit model on all of the employed individuals and then using the results to predict the likeliest industries. We repeat this procedure for occupations. Finally, we estimate the likelihood of being employed using the number of elders with disabilities in each individual's household. We then predict employment likelihood for each scenario after first setting the number of elders with disabilities to zero. To these predicted probabilities we add a random draw from a normal distribution with mean 0 and the standard deviation of the predicted employment likelihoods. We do this separately for men and women.

We next use a three-stage Heckit procedure to impute wages and hours for each individual. The imputations for the earnings and usual weekly hours of paid work are performed using a three-stage Heckit procedure Berndt 1996, p. 627, separately for each combination of four age categories,[14] sex, and location (rural versus urban). The first stage is a probit estimation of labor force participation:

$$lf_i^* = \alpha_1 + \beta X + \epsilon_i \quad (9)$$

$$lf_i = 1if\hat{lf_i}^* > 0\&\epsilon_i \; N(0,1) \quad (10)$$

The vector of explanatory variables, X, comprises the number of children aged less than five, the number of children aged six to twelve, and the number of elders in the household, the individual's education, and the individual's spouse's age, education and labor force status. The regression is run on the universe of all eligible adults. The Mills ratio is calculated for all individuals using the results of the first stage regression:

$$\lambda = f(\frac{-\hat{lf}}{\sigma_{\hat{lf}}})/(1 - F(\frac{-\hat{lf}}{\sigma_{\hat{lf}}})) \quad (11)$$

Where f is the normal density function, F is the normal distribution function, $\hat{lf}$ is the estimated probability of labor force participation, and $\sigma_{\hat{lf}}$ is the standard deviation of $\hat{lf}$.

The second stage is an OLS estimate of the log of hourly wage:

$$\log w_i = \alpha_2 + \gamma_2 Y + \theta_2 \lambda + \mu_i \quad (12)$$

This regression is run only on those that are actually employed for pay. The vector of explanatory variables, Y, in this stage includes the individual's education, age,

[14] Less than 25 years old, 25 to 34 years old, 35 to 54 years old, and 55 and older.

industry, occupation, and state, and finally, λ, the Mills Ratio calculated in the first stage. Inclusion of the Mills Ratio corrects for the selection bias induced by limiting the regression to those in paid employment. The imputed log of wage is predicted for donors and recipients from the results of the regression, with industry and occupation replaced for the latter by the likeliest industries and occupations predicted in the previous step.

The third stage is a regression of usual hours of paid work per week:

$$h_i = \alpha_3 + \gamma_3 Z + \omega \log \hat{w}_i + \theta_3 \lambda + \eta_i \tag{13}$$

The regression is once again run only on those in paid employment. The vector of explanatory variables, Z, in this stage is the same as the previous stage, with the addition of the number of children aged less than five, the number of children aged six to seventeen, and the number of elders in the household and the individual's spouse's labor force status. Finally, the imputed wage predicted in the second stage and the Mills Ratio calculated in the first stage are included. Imputed hours per week are predicted for donors and recipients using the results of the regression, replacing the industry and occupation of the latter with their predicted values as for the wage equation.

With the variables generated in the previous steps, as well as other characteristics, we then proceed through the job assignment procedure, which is run separately for each policy scenario. For each industry and occupation pair in turn, for those recipients for whom the industry and occupation were the likeliest we identify a pool of individuals actually employed in that industry and occupation that most resemble each recipient using a weighted affinity score. We randomly draw from this group of donors and assign the job to the recipient. We next check that the sum of the weights of the recipients does not exceed the number of new jobs available. If there are more recipients than jobs, we make the assignment only to those that are the likeliest to be employed (using the results of the *probit* estimation from the first step), using up all of the available jobs. If there are more jobs than recipients, they are all assigned jobs. The assignment involves copying the industry, occupation, earnings and usual hours of employment from the donor to the recipient. The total jobs assigned is then subtracted from the total remaining to be assigned in that cell of the industry/occupation. Those assigned jobs are removed from the remaining recipient pool and the process continues. If after going through all the possible assignments for recipients' first most likely industry and occupation there are still jobs remaining, we move on to the second most likely industry and occupation and repeat the above procedure. This process iterates until all jobs have been assigned.

Once the jobs assignment is complete, we address the likelihood of a reshuffling of

household production responsibilities in recipient households. We thus go through a second round of statistical matching. In this round, the recipient pool consists of all those for whom time use information is available in household that contain at least one job recipient. The donor pool consists of everyone in the survey. The change in the allocation of time use hinges on the change in the number of workers in the household, so for this round of hot-deck matching we weight the number of male and female workers as heavily as the number of adults and the number of children in the household. In this case, we match within groups of individuals with the same sex, age category and educational attainment.

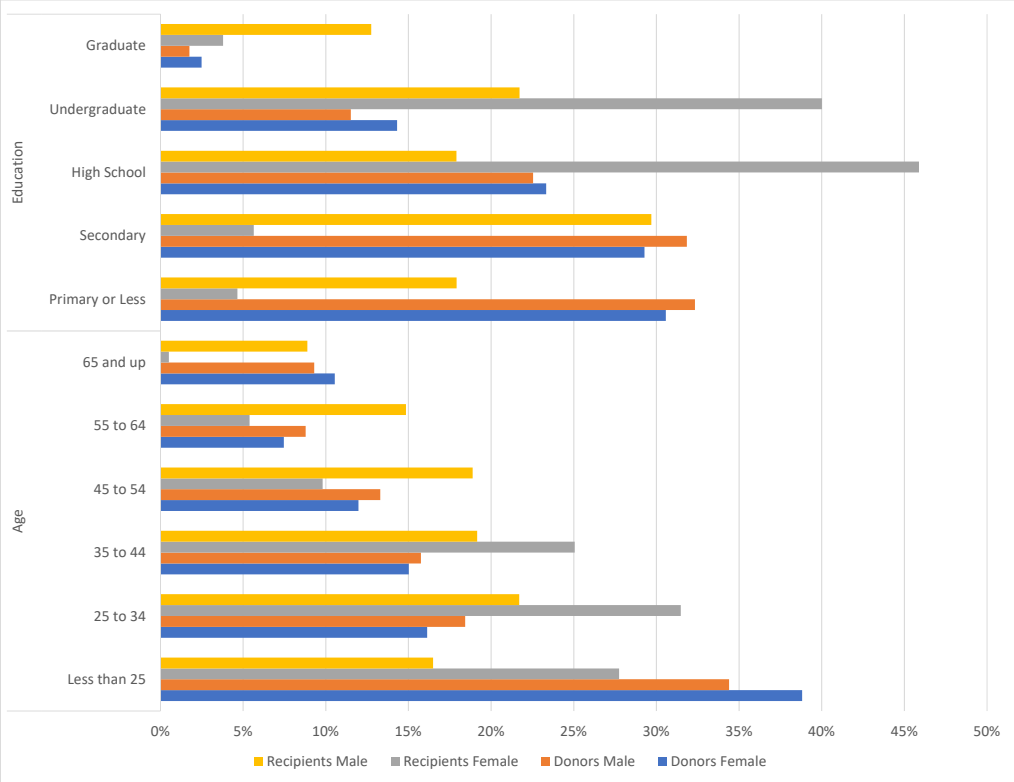
This procedure gives us a new distribution of employment, earnings, and time spent on paid employment and household production. Finally, we check the results to the best of our ability. This is largely a judgement call since there is no counterfactual distribution with which to compare our estimates. We now move on to document the microsimulation and to report the checks we do to ensure the quality of the microsimulation.

C.2. Employment Simulation Results

The donor and recipient pools are identical for both policy simulations. In Figure C1 below, however, we compare the demographic composition of the donor pool to the job recipients in the simulation. To begin with, we first note that the number of recipients (622 thousand) is just one percent of the size of the donor pool (i.e., the total number of employed, 61.2 million). The overall gender balance of the two groups is also different: 42.4 percent of donors are female, while only 37.1 percent of recipients are. The educational composition is quite different between the donors and recipients, with a larger share of the recipients having college degrees or more, while among women, there are a larger share of high school graduates among the recipients than the donors. This reflects the impact that education has on the likelihood of being employed, an important factor in our simulation. While male recipients are relatively evenly distributed by age, female recipients tend to be younger, though a greater share of donors are among the youngest age category. In fact, the donor pool has larger shares of those younger than 25 years old than either male or female recipients. The age distribution of recipients reflects the impact of age on the labor force engagement of women: younger women are more likely to be employed because older women are more likely to be married and not working.

We use the existing distribution of employment in the ENIGH to predict the likelihood of finding employment in the scenario for those individuals in the recipient pool. This is done with three separate maximum likelihood estimates. We estimate

Figure C1: Composition of Potential Donors and Actual Recipients in Employment Simulation, by Sex, Age and Education



Source: Authors' calculations based on synthetic file

multinomial *probit* models that yield predictions of the likelihood of individuals being employed in each of 23 industries and 9 occupations. We then predict the likelihood of being employed using a logit model. We provide details of the latter estimates first, the move on to the likely industry and occupation estimates.

For the universal elder care case, we incorporate the policy impact by including the number of elderly persons with disabilities in the household in the model. For the prediction we set this value to zero. This provides a maximum predicted impact of the policy by implicitly assuming that the policy alleviates all care responsibilities for the individuals in the affected households. From the perspective of assessing the impact of the policy on labor force participation, this is a best-case scenario.

Table C1, below, has the results of the maximum likelihood estimation for employment for men and women separately. We ran one model for both policy scenarios. It

includes one policy variable for each scenario: the number of children aged 6 to 12, for the Full-Time School scenario; and the number of disabled elders in the household, for the Universal Elder Care scenario. Note first the larger impact of age on female likelihood of employment than men. For the policy variables, the number of primary school age children has opposite impacts on men and women: we estimate that the former are less likely and the latter more likely to be employed. The number of disabled elders is estimated to reduce the likelihood of both men and women being employed. Though this is a much stronger signal for men than for women.

Table C1: Results of Logistic Regression of Employment for Men and Women

	Female	Male
Age	-0.010***	0.002***
	-0.000	-0.001
Number of Children under 6	-0.289***	0.052**
	-0.013	-0.022
Number of Children 6 to 12	-0.098***	0.083***
	-0.013	-0.022
Number of Disabled Elders	-0.068*	-0.341***
	-0.036	-0.051
Number of Children	0.082***	0.054***
	-0.010	-0.015
Education		
Secondary	0.070***	0.160***
	-0.016	-0.024
High School	0.201***	0.157***
	-0.018	-0.026
Undergraduate	0.583***	0.187***
	-0.023	-0.032
Graduate	1.117***	0.570***
	-0.067	-0.094
Aguascalientes (omitted)		
Baja California	-0.189***	-0.067
	-0.038	-0.056
Baja California Sur	-0.076**	-0.009
	-0.038	-0.057
Campeche	0.084**	0.093
	-0.038	-0.059

Coahuila de Zaragoza	-0.199***	-0.100**
	-0.033	-0.051
Colima	-0.011	0.079
	-0.038	-0.058
Chiapas	0.152***	0.188***
	-0.039	-0.064
Chihuahua	-0.149***	-0.026
	-0.034	-0.053
Ciudad de Mexico	-0.184***	-0.277***
	-0.038	-0.055
Durango	-0.125***	-0.096*
	-0.036	-0.056
Guanajuato	-0.190***	-0.076
	-0.036	-0.054
Guerrero	0.061	0.050
	-0.038	-0.059
Hidalgo	-0.024	-0.045
	-0.038	-0.059
Jalisco	-0.163***	0.003
	-0.036	-0.056
Mexico	-0.221***	-0.213***
	-0.036	-0.053
Michoacan de Ocampo	0.008	0.136**
	-0.038	-0.064
Morelos	-0.021	-0.077
	-0.037	-0.057
Nayarit	0.091**	0.099
	-0.039	-0.062
Nuevo Leon	-0.220***	-0.032
	-0.037	-0.057
Oaxaca	0.154***	0.088
	-0.037	-0.060
Puebla	0.079**	0.141**
	-0.038	-0.061
Queretaro	-0.055	-0.083
	-0.035	-0.053
Quintana Roo	-0.155***	-0.287***
	-0.039	-0.056

San Luis Potosi	-0.088**	0.002
	-0.036	-0.058
Sinaloa	-0.239***	-0.101*
	-0.034	-0.053
Sonora	-0.135***	-0.041
	-0.038	-0.057
Tabasco	-0.109***	-0.115**
	-0.039	-0.058
Tamaulipas	-0.227***	0.028
	-0.038	-0.060
Tlaxcala	-0.120***	0.047
	-0.036	-0.058
Veracruz	-0.040	-0.015
	-0.037	-0.059
Yucatan	0.117***	0.211***
	-0.038	-0.062
Zacatecas	-0.186***	0.159***
	-0.036	-0.060
Rural Location	-0.290***	0.151***
	-0.012	-0.019
Constant	0.604***	1.081***
	-0.040	-0.057
Observations	92462	84485

Estimated coefficients and standard errors
*p¡0.1, ** p¡0.05, *** p¡0.01*

The likeliest predicted industries and occupations for all recipients are presented in Tables C2 and C3 below.[15] The same predictions are used for both policy scenarios. Unsurprisingly, the likeliest industries are those with the highest levels of employment. Other services, retail trade, and agriculture together are the likeliest industries for over two thirds of the potential job recipients. Meanwhile many of the other industries are the likeliest industry for none of the recipient pool. Nearly three-quarters of potential recipients' likeliest occupation is elementary and support activities.

[15] We also assign the second to twenty-third likeliest industries and the second to the ninth likeliest occupations for use in the jobs assignment.

Table C2: Predicted Likeliest Industries for Potential Recipients

Industry	Number	Share
Agriculture, Forestry, Fishing and Hunting	4,267,536	12.4%
Construction	2,867,204	8.3%
Manufacturing - Food and Apparel	502,358	1.5%
Manufacturing - Wood, Chemical, and Plastics		
Manufacturing - Metal, Machinery, and Equipment	2,537,119	7.4%
Retail trade	7,216,159	21.0%
Transportation	339,509	1.0%
Professional, Scientific, and Technical Services	173,254	0.5%
Educational Services	2,796,052	8.1%
Health Care and Social Assistance	12,271	0.0%
Accommodation and Food Services	414,525	1.2%
Other Services (except Public Administration)	12,276,209	35.7%
Public administration	999,565	2.9%
Total	34,401,761	

Source: Authors' calculations.

Table C3: Predicted Likeliest Occupations for Potential Recipients

Occupation	Number	Share
1. Officers, directors and head officers		
2. Professionals and technicians	5,267,574	15.3%
3. Auxiliary workers in administrative activities	1,633,517	4.7%
4. Merchants, Sales Clerks, and Sales Agents	980,301	2.8%
5. Workers in personal and surveillance services	1,646	0.0%
6. Workers in agricultural, livestock, forestry, hunting and fishing activities		
7. Craft, construction and other trades workers		
8. Industrial machinery operators, assemblers, drivers and transport drivers	1,272,516	3.7%
9. Workers in elementary and support activities	25,246,207	73.4%
Total	34,401,761	

Source: Authors' calculations.

The distribution of jobs created according to our estimates are those depicted in Table C4, below, by industry and occupation.[16] The combinations with the largest

[16]For occupation titles, refer to Table C3, above.

numbers of jobs created are: first, the Health Care and Social Assistance industry and Professional and Technician occupations, with 163 thousand jobs; and second, the Construction industry and Workers in Elementary and Support Activities occupations with 84 thousand jobs. The distribution by industry comes from the results of our IO model, described in Appendix B, above. The distribution of jobs by occupation within each industry is taken from the existing distribution by industry in the ENIGH 2020.

The assignment of jobs occurs by selecting for each industry and occupation pair, the individuals in the recipient pool to be employed that are predicted to have the corresponding likeliest industry and occupation. Once all of the possible assignments based on the first likeliest predicted occupation and industry have been made, we move on to the next likeliest, and so on until all of the jobs have been assigned. The degree to which the assignments will match the most likely industry and occupation for each job recipient depends on the distribution of jobs by industry and occupation as well as the distribution of recipients by their likeliest jobs and occupations and their likeliness to be employed at all. Tables C5 and C6 show the degree to which the job assignments made to individuals in the recipient pool correspond with their likeliest occupation and industry. Given the mismatch between likeliest industries and occupations as seen above and the distribution of jobs created, the share of recipients receiving jobs in their likeliest industries (31 percent) and occupations (42 percent) are sufficiently high.

Table C4: Estimated Jobs Created by Industry and Occupation

	Occupations									
Industries	1	2	3	4	5	6	7	8	9	Total
Agriculture, Forestry, Fishing and Hunting	108	240	68	79	141	13,146	42	145	11,868	25,837
Mining	111	455	113	5	67	0	329	535	535	2,150
Utilities	282	914	486	7	57	0	332	578	503	3,160
Construction	3,765	11,155	1,914	349	691	7	54,907	3,715	84,395	160,899
Manufacturing - Food and Apparel	334	585	443	1,036	112	65	6,183	2,391	3,244	14,394
Manufacturing - Wood, Chemical, and Plastics	794	1,942	1,128	729	219	65	4,147	4,402	3,981	17,408
Manufacturing - Metal, Machinery, and Equipment	449	1,253	499	223	50	0	1,630	5,447	2,018	11,569
Wholesale trade	424	688	870	2,484	79	88	256	1,228	1,244	7,360
Retail trade	1,562	1,264	3,412	32,020	345	45	1,341	1,289	6,440	47,717
Transportation	513	682	1,002	28	124	0	46	9,201	892	12,487
Postal services and warehousing	73	63	369	6	7	0	0	642	252	1,412
Information	358	1,387	451	424	32	0	20	71	189	2,930
Finance and Insurance	387	632	782	1,071	7	0	0	19	36	2,935
Real Estate and Rental and Leasing	177	298	177	618	131	1	68	91	224	1,784
Professional, Scientific, and Technical Services	672	5,524	639	183	34	0	101	68	239	7,460
Management of Companies and Enterprises	9	31	6	0	0	0	0	0	8	55
Administrative and Support and Waste Management and Remediation Services	573	1,507	1,570	429	4,592	11	75	336	4,306	13,400
Educational Services	193	1,950	177	8	78	0	6	3	129	2,546
Health Care and Social Assistance	8,841	163,289	28,270	781	10,342	0	469	1,069	14,134	227,194
Arts, Entertainment, and Recreation	138	848	131	68	158	9	7	6	238	1,602
Accommodation and Food Services	1,938	1,371	2,922	1,208	31,527	20	6,555	2,184	28,456	76,180
Other Services (except Public Administration)	433	4,422	607	191	4,669	47	1,854	369	13,893	26,484
Public administration	10	22	16	0	11	0	1	2	4	66
Total	22,144	200,522	46,054	41,946	53,474	13,504	78,368	33,791	177,228	667,030

Source: Authors' Calculations based on ENIGH 2020

Table C5: Predicted Likeliest Industries and Assigned Industries for Job Recipients

		Likeliest Industry												
	Assigned Industries	11	23	31	33	46	48	54	61	62	72	81	93	Total
11	Agriculture, Forestry, Fishing and Hunting	**14,650**	8,792				187					805	410	24,844
21	Mining	370												370
22	Utilities								1,121				722	1,843
23	Construction	77,086	77,550		484	3,653	729						115	159,617
31	Manufacturing - Food and Apparel		854	775		6,626						3,590		11,845
32	Manufacturing - Wood, Chemical, and Plastics	3,059	1,054		5,890				5,180				301	15,484
33	Manufacturing - Metal, Machinery, and Equipment	1647	831	2523	2971	1737								9709
43	Wholesale trade	602			1175	2699							610	5086
46	Retail trade	453	2424			38089					219	1721	1538	44444
48	Transportation	1741	5137		425	1426	1848							10577
49	Postal services and warehousing					176					113			289
51	Information								297					297
52	Finance and Insurance							984						984
53	Real Estate and Rental and Leasing										438		256	694
54	Professional, Scientific, and Technical Services				733	3346			982					5061
56	Administrative and Support and Waste Management and Remediation Services				2132		4195						2448	8775
61	Educational Services								1285					1285
62	Health Care and Social Assistance				2814	27430		2115	181923	5844			2134	222260
71	Arts, Entertainment, and Recreation					515								515
72	Accommodation and Food Services	496	7395		2168	26296					38457			74812
81	Other Services (except Public Administration)				586	13296						9409		23291
93	Public Administration													
	Total	100104	104037	3298	19378	125289	6959	3099	190788	5844	39227	15525	8534	622082

Source: Authors' calculations from synthetic dataset

Table C6: Predicted Likeliest Occupations and Assigned Occupations for Job Recipients

		Likeliest Occupations						
	Assigned Occupation	2	3	4	5	8	9	Total
1	Officers, directors and head officers	15,714	139	0	0	0	475	16,328
2	Professionals and technicians	**154,439**	0	0	0	914	37,524	192,877
3	Auxiliary workers in administrative activities	31,651	**0**	1,513	0	627	4,658	38,449
4	Merchants, Sales Clerks, and Sales Agents	4,095	4,725	**0**	0	685	27,129	36,634
5	Workers in personal and surveillance services	9,235	1,395	201	**0**	0	39,476	50,307
6	Workers in agricultural, livestock, forestry, hunting and fishing activities	0	0	0	0	100	12,603	12,703
7	Craft, construction and other trades workers	3,066	0	341	0	1,730	70,240	75,377
8	Industrial machinery operators, assemblers, drivers and transport drivers	8,642	113	176	138	**4,746**	13,549	27,364
9	Workers in elementary and support activities	16,584	14,758	33,657	0	6,436	**100,608**	172,043
	Total	243,426	211,30	35,888	138	15,238	306,262	622,082

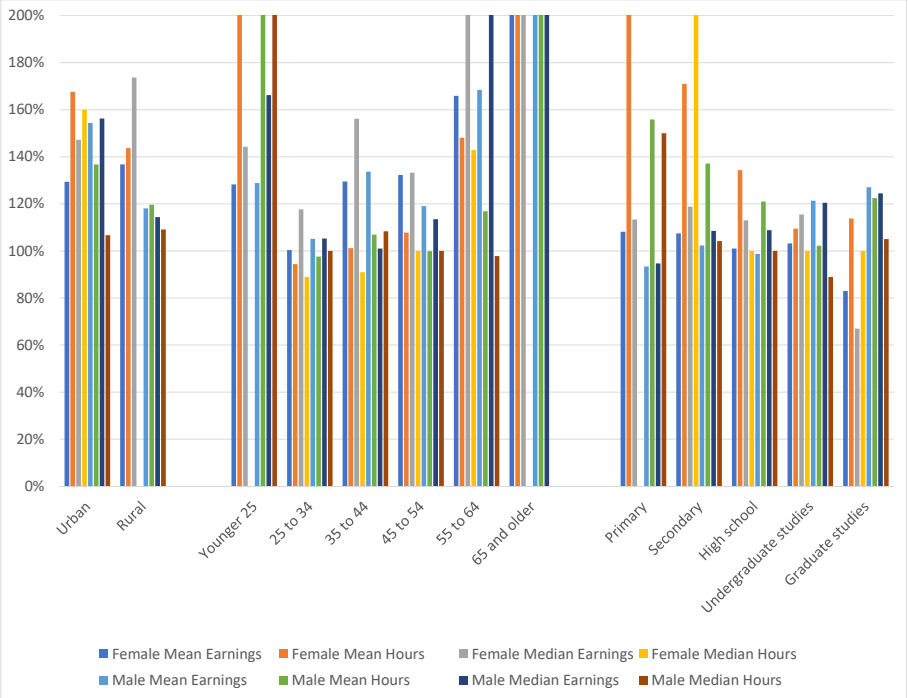
Source: Authors' calculations from synthetic dataset

We next compare the distribution of hours and earnings in the simulation to the donor pool. This serves as a coarse test for plausibility of the results, since we can make no direct comparisons of the counterfactual distribution we produce in our simulation and the existing distributions of hours and earnings. Figure C2, below provides the ratio of the earnings and hours of job recipients to the actual mean and medians by sex and demographic characteristics. The figure is truncated at 200 percent for purposes of readability. Most ratios are quite close to unity, while others are quite large. The largest is for the mean weekly hours of females 65 and older. In the donor pool the mean hours for this group was just 4 hours per week. In the simulation the mean is 40 hours. Median hours were 0 for this group, while it was 40 for the recipients in this group. While these are large differences, there were only 3,400 female job recipients 65 or older in the simulation. Overall, the earnings and hours assignments are very plausible. We now move on to consider the reassignment of household production hours within those households that has job recipients in the simulation.

We reassign household production hours using the new earnings composition of the households with job recipients to simulate the effect of new employment on household time use. The donor pool in this case is all individuals with time use information. The recipient pool is all those 12 years of age and older in households with job recipients. In all, 2 million individuals were reassigned household production time out of the total of 96 million whose time use is available in the synthetic file. The demographic profiles of the donors and recipients are very similar (see Figure C3, below). There are small differences that follow patterns seen in the earnings composition comparisons. The donor group is lightly older and has lower educational attainment, overall, than the recipients. At any rate, the donor pool is large enough that no recipient should be matched with a very dissimilar donor.

We expect the simulated distribution of household production time to be more like the actual distribution than earnings, simply because household time use does not vary as much as earnings and hours of employment. Figure C4, below, displays the ratios of mean and median household production hours of individuals that had hours reassigned and the population as a whole, by sex and age and by sex and education. The reassignment has not produced any major inconsistencies. The ratios are in most cases close to

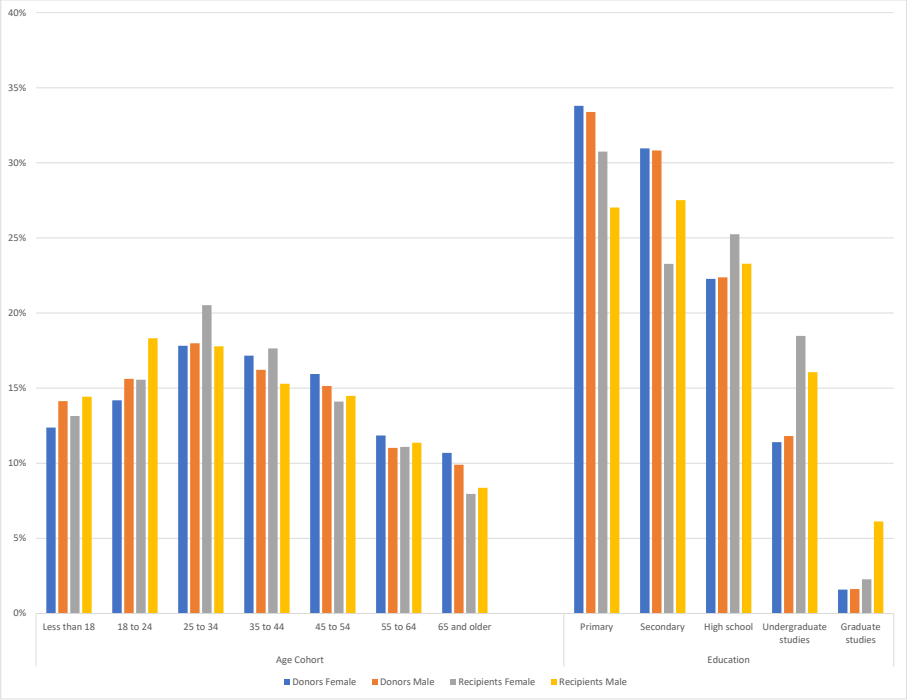
Figure C2: Ratio of Mean and Median Earnings and Hours, Simulated to Actual



Source: Authors' calculations based on synthetic file

unity. One exception is that of young female recipients, whose median hours are 41.8 hours per week, compared to 28.2 for the donor pool. This perhaps reflects a greater share of the burden of household production time falling on younger women in households with more economically active adults. Males older than 65 have a somewhat lower mean and median household production time in the reassigned group (18.1 and 14.5 hours per week, respectively) than in the population as a whole (23.6 and 19.2 hours per week, respectively), as do females with postgraduate education (a mean of 37.4 and a median of 33.4 hours per week in the overall population, compared to 30.1 and 26.1 hours per week among recipients). These two groups are relatively small parts of the recipients, though (71 thousand for

Figure C3: Proportion of Donors and Recipients by Sex and Demographic Characteristic

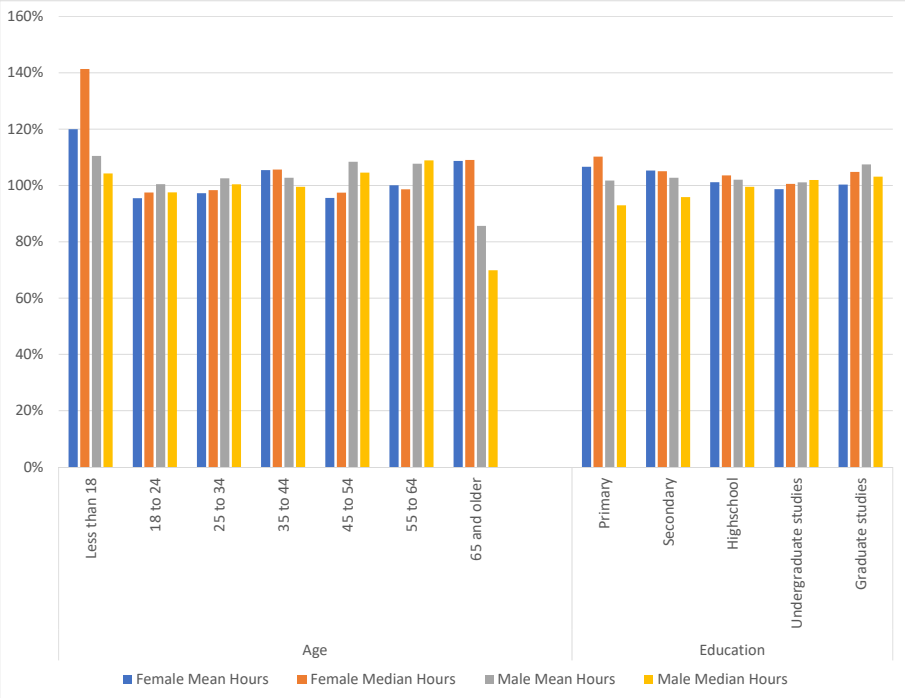


Source: Authors' calculations based on synthetic file

elderly males and 31 thousand for postgraduate females), compared to 155 thousand females under 18 years old.

Overall, the assignment of jobs to individuals in the recipient pool produced results that were reasonable, as did the reassignment of household production hours. There were some differences in mean earnings and hours among certain groups, but this is likely due to the concentrated nature of the employment changes by industry and occupation.

Figure C4: Ratio of Household Production Hours, Simulated to Actual



Source: Authors' calculations based on synthetic file