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Long-Term Care in Latin America and the Caribbean: Theory and Policy Considerations

ABSTRACT This paper discusses theoretical and practical issues related to long-term care (LTC) services in Latin America. Demand for these services will rise as the region undergoes a swift demographic transition from its currently young population to a rapidly aging one, especially since the region's aging cohorts are more prone to experience a decline in their functional and physical abilities than elderly people elsewhere in the world. We argue that private insurance markets are ill-equipped to provide coverage to meet the need for LTC, while the amount of personal savings required to afford self-insurance would be prohibitively high. In Latin America, LTC may not be an immediate priority, but governments are likely to encourage the development of LTC programs as demand for them steadily grows. In particular, policymakers are probably going to focus initially on LTC programs for the poor and vulnerable, for whom affordability of LTC is a greater problem. We therefore study how basic elements of policy design affect the cost-effectiveness of LTC programs by means of a formal model. In a simple context where families can provide care themselves or hire care in a market, we find that pro-poor programs are more cost-effective when families have the option to receive cash subsidies, as the opportunity cost of providing care is lower for poor families. Moreover, the availability of in-kind and cash choices reduces program costs overall by screening families based on their opportunity cost of providing care.

JEL Codes: J14, N36

Keywords: Long-term care, long-term care insurance, population aging, Latin America

Worldwide, the process of population aging has increased the need for long-term care (LTC) services to assist the elderly. According to the U.S. Department of Health and Human Services, "Long-term care is a range of services and supports you may need to meet your personal care needs. Most long-term care is not medical care, but rather assistance with the basic personal tasks of everyday life, sometimes called Activities of Daily

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Living (ADLs)."[1] Most LTC-related activities do not require care providers to have acquired highly specialized skills, and customarily family members—typically women—have provided care for people with disabilities.[2]

This traditional arrangement has come under significant stress as a result of steady demographic and sociocultural changes. Life expectancy has increased, and with it the probability of needing LTC, while fertility has fallen and female labor force participation has expanded, reducing the pool of family caregivers. In response, developed countries have designed social LTC programs, with an average cost of 1.7 percent of GDP in public expenditure in eleven members of the Organization for Economic Cooperation and Development (OECD).[3]

There are two fundamental reasons why LTC will become a more pressing issue in Latin America in the coming decades. First, although its population is younger today than the world average, Latin America is aging faster than any other region in the world. Second, there is a body of evidence that shows that its future elderly populations will be prone to dependency situations that require LTC. Life expectancy in Latin America has increased without being accompanied by the same improvements in living standards and nutrition as the advanced economies.[4] As a result, the region's population is more prone to obesity, hypertension, arthritis, and high cholesterol, all of which increase the probability of early aging and the need for care.[5]

The literature on LTC insurance is rather skeptical regarding the competence of private markets to satisfy the needs for LTC. In addition to the typical market failures of insurance markets, such as adverse selection and moral hazard, LTC insurance is vulnerable to several sources of common shocks, especially the duration of LTC needs and future costs. For example, de La Maisonneuve and Oliveira Martins estimate the future costs of LTC in OECD countries and forecast that costs could vary by as much as 5 percent of GDP, depending on the scenario.[6] On the demand side, the cost of insurance is rather high for middle- and low-income families, and it is likely that people

1. See the website of the U.S. Administration on Aging (https://longtermcare.acl.gov/the-basics/what-is-long-term-care.html).

2. Throughout this paper, the term *disability* refers to a situation in which a person experiences a long-term decline in his or her functional and physical abilities that prevents the person from performing ADLs autonomously.

3. OECD (2015).

4. Palloni and others (2006).

5. Al Snih and others (2010); Medici (2011); Matus-López (2015).

6. De La Maisonneuve and Oliveira Martins (2013).

would rather allocate additional income to retirement funds, general savings, or other sources that, unlike LTC insurance, are noncontingent. Moreover, the complexity of LTC insurance contracts makes it difficult to assess value for money.[7] In addition, the empirical literature on the effect of incentives on insurance take-up shows that the latter is either hardly responsive or fails to compensate program costs.[8]

In light of the low take-up of LTC insurance and the intrinsic market failures in this industry, there is a strong case for social insurance programs for LTC.[9] Advanced economies have responded to their own aging societies by designing such schemes. Overall, the experience of high-income countries provides valuable insights into possible alternatives, although the adoption of such programs in Latin America is not straightforward. Fiscal constraints, the limited supply of LTC services by existing public health service providers, and the lack of regulated private LTC markets are of particular concern. But absent any insurance scheme, families in Latin America would have to bear the costs of LTC by themselves. This is something that poor, vulnerable, and most middle-income families cannot afford, so the likelihood of some type of policy response will increase as the region's population ages.

These affordability concerns motivated us to develop a formal model to study the cost-effectiveness of LTC programs. Our model, though simple, gives valuable insights. In a context where families respond to the need for LTC by providing care themselves or by purchasing care in a market, we first find that poor families have a preference for cash subsidies, making pro-poor programs more effective when they allow cash transfers. Second, we show that when people differ in their valuation of LTC services, allowing people to choose between in-kind or cash subsidies reduces the total cost of the program. Although we study these elements of design in a simple context, we argue that the results are very robust, as they are applications of well-established results in economics.

The remainder of this paper is structured as follows. The next section discusses evidence on population aging and the health of aging cohorts in Latin America and the Caribbean, which drives future demand for LTC. We then discuss the prospects for LTC policy, with particular emphasis on the rationale for public policy, its motivations, and the restrictions behind it.

7. Colombo and others (2011).

8. Brown, Coe, and Finkelstein (2007); Bergquist, Costa-i-Font, and Swartz (2018); Courtemanche and He (2009); Goda (2011).

9. Barr (2010).

The paper then presents our model on the effect of cash and in-kind subsidies and our corresponding assessment on the cost-effectiveness of the programs. We close the paper with several concluding remarks.

Future Need for LTC in Latin America

The last century or so has been characterized by steady demographic changes worldwide. Better living standards and improvements in technology and medicine have increased life expectancy. These demographic changes have been accompanied by complex sociocultural changes, such as increased female labor force participation and falling fertility rates. These phenomena have resulted in a persistent aging of the population. Figure 1 shows the process of population aging for different regions of the world since 1950 (the earliest year with homogeneous data worldwide). The process has been steady and generalized in recent history.

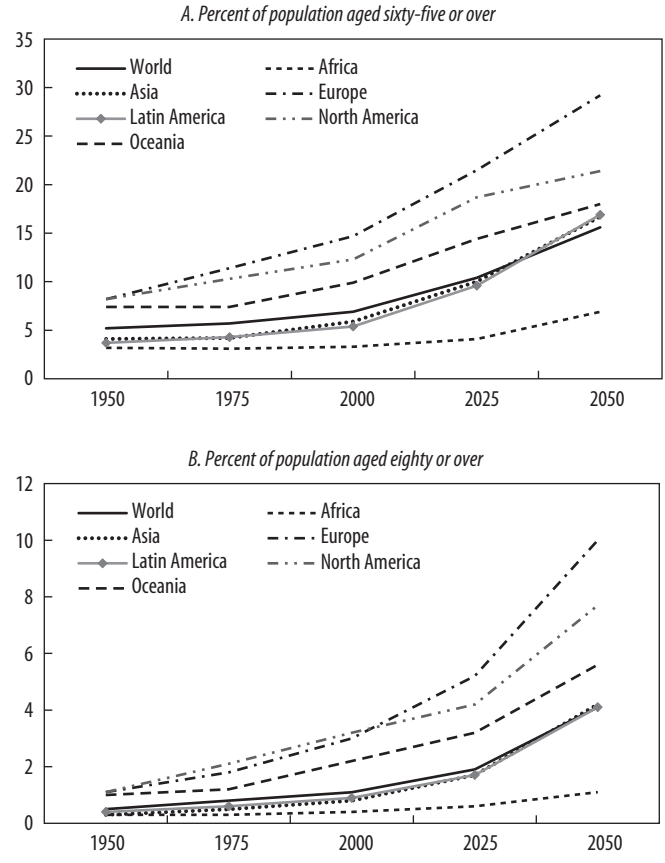
Latin America is still young compared to developed countries, and it is even slightly younger than the world average; however, its rate of aging is among the highest. According to Kinsella and Phillips, it took 115 years in France and eighty-five years in Sweden for the share of the population over sixty years of age to increase from 7 percent to 14 percent, whereas Brazil and Colombia will need only twenty-one and twenty years, respectively.[10] Although Latin America's population is aging quickly, figure 1 reveals that aging levels similar to those of the advanced economies in 2000 will not be reached in the region until around 2050.

Figure 2 shows that population aging is occurring in all countries in the region. Nevertheless, there is considerable variation among countries in terms of the overall elderly population rate and the rate of aging. As the figure shows, most countries in the region will have an elderly rate of around 15 percent or more by 2030. Overall, in terms of the fertility rate, life expectancy, and share of population over sixty-five, some countries in Latin America are reaching the stage that OECD countries had when they began to set up the institutional framework for their LTC systems.[11]

Despite the aging of the population in Latin America, it is possible, at least in theory, for the future demand for LTC to fall despite increasing life expectancy. This will happen if the health status with which people reach

10. Kinsella and Phillips (2005).
11. Matus-López (2015).

FIGURE 1. Share of Elderly Population Worldwide

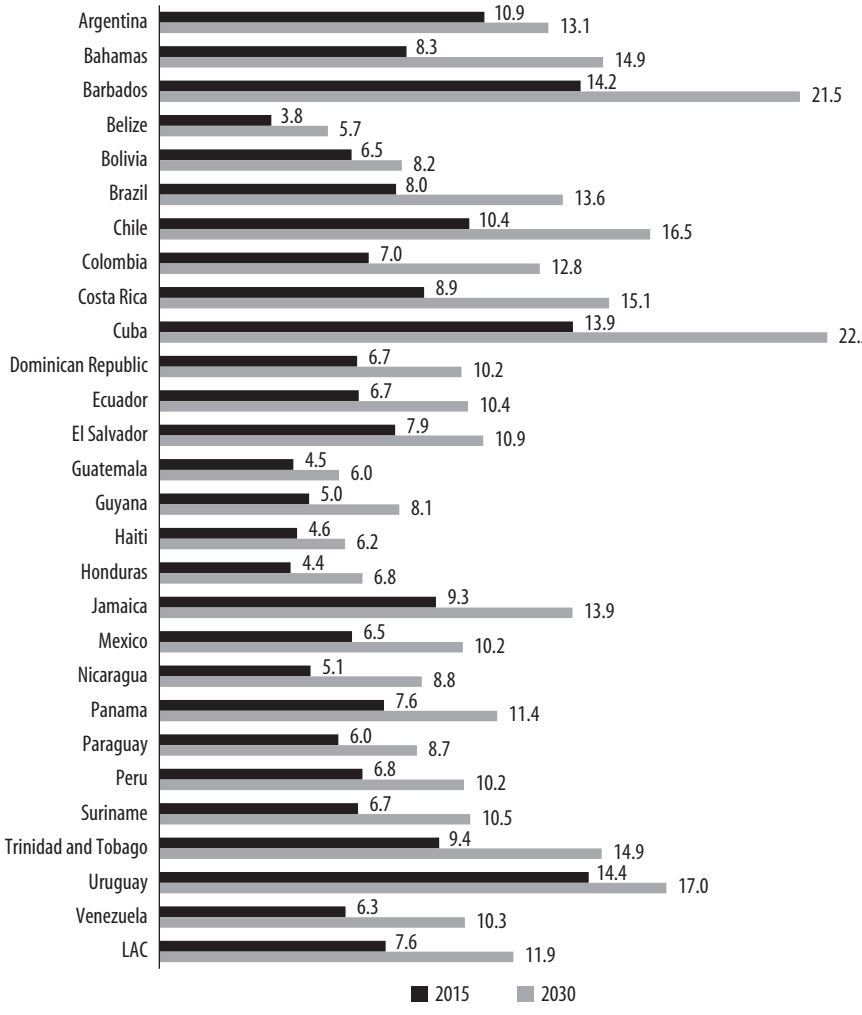


Source: Authors' elaboration, based on United Nations (2015).

advanced age improves, as well. The literature has developed an interesting hypothesis regarding the health profile of the upcoming generations of elderly in Latin America. Palloni and others note that the new elderly will have experienced large improvements in the control and mitigation of the effects of infectious and water-borne diseases.[12] These improvements, however, were not accompanied by substantial increases in standards of living, since poverty and malnutrition are still widespread. As a result, Palloni and

12. Palloni and others (2006).

FIGURE 2. Share of Elderly Population in Latin America and the Caribbean



Source: Authors' elaboration, based on United Nations (2017).

Souza believe that people becoming elderly after 2010 will be more fragile, with a greater prevalence of adult chronic conditions and excess mortality risk.[13] This contrasts with the situation when developed countries reached a similar stage in the demographic transition, where the population aged under better socioeconomic conditions. For example, education levels and average income were higher in OECD countries twenty or thirty years ago than they are today in the Latin American and Caribbean countries that are reaching similar demographic transition thresholds.

A considerable body of evidence documents the link between early life conditions and adult health. Palloni and others find a link between childhood nutritional status and diabetes and between rheumatic fever and heart disease, although the former relation is not strong.[14] Similarly, Monteverde, Noronha, and Palloni find that poor early conditions, defined in terms of both child health and socioeconomic status, induce higher rates of disability.[15] McEniry reviews twenty studies regarding the link between early life conditions and adult health.[16] Her findings indicate that several measures of adverse early life conditions, such as malnutrition, the incidence of certain illnesses, and poor socioeconomic status, have a strong effect on measures of health at a later age, such as decreased cognition, the incidence of heart disease, disability, and mortality rates.

Latin America has a high prevalence of several diseases that commonly lead to needing LTC. For example, the obesity rate in Latin America is the highest of any region except for Europe, the prevalence of diabetes is close to the world average, and old-age dementia is more common in Latin America than in any other region.[17] Though we interpret these diseases as indicators of a high likelihood of needing LTC, again in theory, mortality risk may reduce the length of time during which dependents need LTC and total LTC demand.

To assess whether this is likely, we look at the evolution of life expectancy and healthy life expectancy in the region. Table 1 shows these values at birth for twenty-eight Latin American and Caribbean countries in 2000 and 2015. Both life expectancy and healthy life expectancy have increased in all countries in the period under study. The last column shows that life expectancy

13. Palloni and Souza (2013).
14. Palloni and others (2006).
15. Monteverde, Noronha, and Palloni (2009).
16. McEniry (2013).
17. See tables A1, A2, and A3 in the working paper version of this study (Caruso, Galiani, and Ibarrarán, 2017, appendix).

TABLE 1. Life Expectancy and Healthy Life Expectancy at Birth

	Healthy life expectancy			*Total life expectancy*			
Country	*2015 (1)*	*2000 (2)*	*Difference (3)*	*2015 (4)*	*2000 (5)*	*Difference (6)*	*(6) – (3) (7)*
Antigua and Barbuda	66.9	64.6	2.3	75.0	72.5	2.5	0.2
Argentina	68.2	65.7	2.5	76.8	74.0	2.8	0.3
Bahamas	66.7	63.7	3.0	75.6	72.0	3.6	0.6
Barbados	66.8	65.1	1.7	75.5	73.4	2.1	0.4
Belize	62.3	61.0	1.3	70.3	68.7	1.6	0.3
Bolivia	62.7	56.0	6.7	71.2	63.3	7.9	1.2
Brazil	65.8	61.5	4.3	74.9	69.9	5.0	0.7
Chile	69.6	67.8	1.8	79.4	77.1	2.3	0.5
Colombia	66.8	63.4	3.4	74.9	71.1	3.8	0.4
Costa Rica	70.7	69.0	1.7	79.4	77.4	2.0	0.3
Cuba	69.6	67.7	1.9	78.8	76.6	2.2	0.3
Dominican Republic	64.9	61.8	3.1	73.3	69.7	3.6	0.5
Ecuador	67.6	64.3	3.3	76.3	72.7	3.6	0.3
Grenada	64.6	62.4	2.2	73.3	70.6	2.7	0.5
Guatemala	63.9	59.1	4.8	72.9	67.6	5.3	0.5
Haiti	55.1	50.3	4.8	63.3	58.1	5.2	0.4
Honduras	66.6	62.8	3.8	75.0	71.1	3.9	0.1
Jamaica	66.7	64.1	2.6	75.8	72.6	3.2	0.6
Mexico	67.4	65.6	1.8	76.2	74.5	1.7	–0.1
Panama	69.3	67.4	1.9	77.9	75.8	2.1	0.2
Paraguay	65.1	62.7	2.4	74.1	71.1	3.0	0.6
Peru	67.2	63.3	3.9	75.6	71.3	4.3	0.4
Saint Lucia	66.3	63.6	2.7	75.4	72.2	3.2	0.5
Saint Vincent and the Grenadines	63.6	62.3	1.3	72.3	70.9	1.4	0.1
São Tomé and Príncipe	60.5	55.3	5.2	68.5	62.9	5.6	0.4
Trinidad and Tobago	63.1	61.2	1.9	71.7	69.4	2.3	0.4
Uruguay	68.7	66.6	2.1	76.8	74.8	2.0	–0.1
Venezuela	65.9	64.3	1.6	73.9	72.2	1.7	0.1
Average	65.8	63.0	2.9	74.4	71.2	3.2	0.4

Source: World Health Organization (WHO, 2016).

Note: Life expectancy is given in years. The equivalent lost-healthy-year fractions required for the healthy life expectancy calculation are estimated as the all-cause rate of years lost because of disability per capita, adjusted for independent comorbidity by age, sex, and country. See WHO (2016) for details.

has increased more than healthy life expectancy in all but two countries (Uruguay and Mexico). An analysis of life expectancy and healthy life expectancy at age sixty in the same countries largely leads to the same conclusion.[18]

In comparison, in 2000, life expectancy at birth in Europe was 72.5 years, and healthy life expectancy was 64.2 years. These figures are roughly comparable to the same indicators for Latin America and the Caribbean in 2015.

18. See table A4 in Caruso, Galiani, and Ibarrarán (2017, appendix).

In 2015, these figures rose to 77.2 and 68.1 years in Europe, implying that the gap between life expectancy and healthy life expectancy increased by 0.8 years. Although this is a simplistic interpretation, if Latin America were to follow the same path as Europe with a fifteen-year lag, we would expect the gap between life expectancy and healthy life expectancy to keep widening.

All in all, we take this evidence to be indicative of a future rise in LTC demand. The impetus for this rise will come from population aging. Regarding the health status of future generations of elderly, this may reduce the future need for LTC either because conditions have improved enough to reduce LTC or because health status has worsened to the point at which LTC need is offset by greater mortality risk. Though we do not have the information that would be necessary to assess these issues in detail, aggregate evidence seems to indicate that neither of these channels is strong enough to increase healthy life expectancy more than life expectancy.

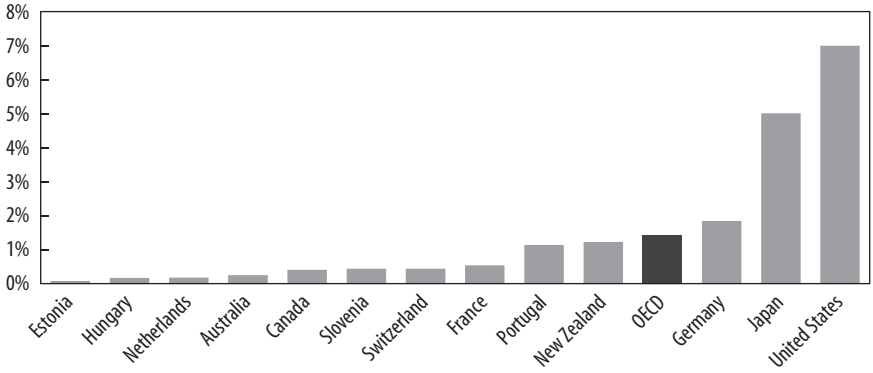
Current State of LTC in Latin America and Possibilities for LTC Policies

Most of the countries in the region have institutions and policies for seniors, and some have advanced in regulations that include aspects related to dependency care. However, comprehensive LTC policies are virtually nonexistent, and regulation or direct provision by the public sector is scarce. Some countries have made progress with specific interventions, in which they have defined quality criteria to achieve the accreditation of institutions providing care services, as well as monitoring and evaluation schemes. One country (Uruguay) has defined a National Integrated Care System that includes LTC, but its interventions prioritize infant care.

Moreover, the region lacks a private LTC insurance market. We think that the main reason for this lies in the market failures that are intrinsic to LTC insurance, which fails to provide coverage to most of the population even in advanced countries. In the United States and France, which are considered the leading markets in terms of coverage, insurance covers about 5 percent and 15 percent of the population aged forty or more, respectively.[19] In Germany, only about 300,000 insurance policies had been sold before the introduction of mandatory insurance in 1995.[20] More recently, Arntz and others estimate that 9 percent of the German population is covered by private LTC insurance,

19. Colombo and others (2011).
20. Hauschild (1994).

FIGURE 3. Share of Private Insurance Spending in Total LTC Spending



Source: Colombo and others (2011).

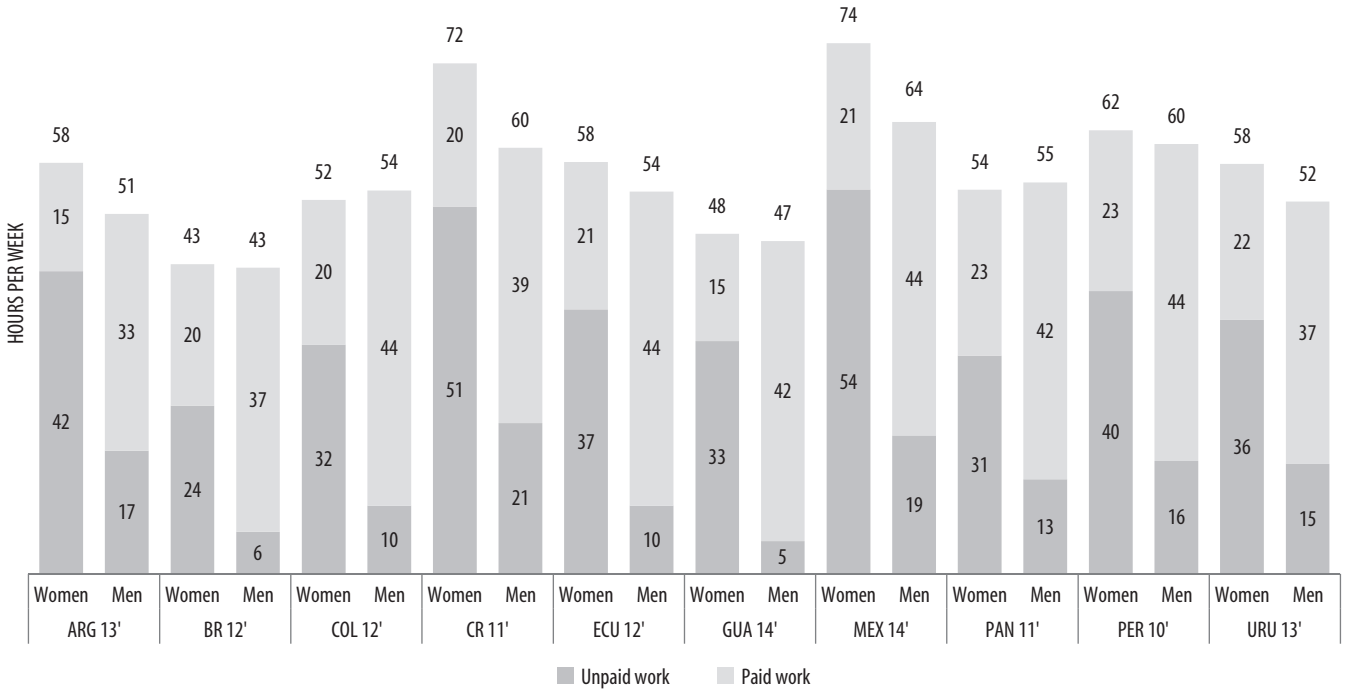
while 90 percent is covered by social insurance.[21] Figure 3 shows that the share of private LTC insurance in total LTC spending is very small, even in the countries with the most widespread coverage.

Absent public LTC programs and private LTC insurance markets, who provides LTC, and how are LTC arrangements made in Latin America and the Caribbean? A report by the International Labour Organization (ILO) states that only 1 percent of the region's population over sixty years of age lives in nursing homes, and the share that receives formal care at home is also low; as such, remunerated care is rare and concentrated in families with high incomes.[22] Hence, care is largely provided by family members, who may devote substantial time and expense, depending on the care requirements of the person in question. Care may also strain the household budget if caregivers need to forgo paid work opportunities to provide care.

In Latin America, the burden of care falls disproportionately—almost exclusively—on women. Time-use surveys show that the bulk of unpaid housework falls on women, and women double or triple the amount of time that men dedicate to caring for others.[23] Figure 4 confirms that although men spend more time working for wages, women work more overall, since female work in the home more than compensates work for wages. Similarly,

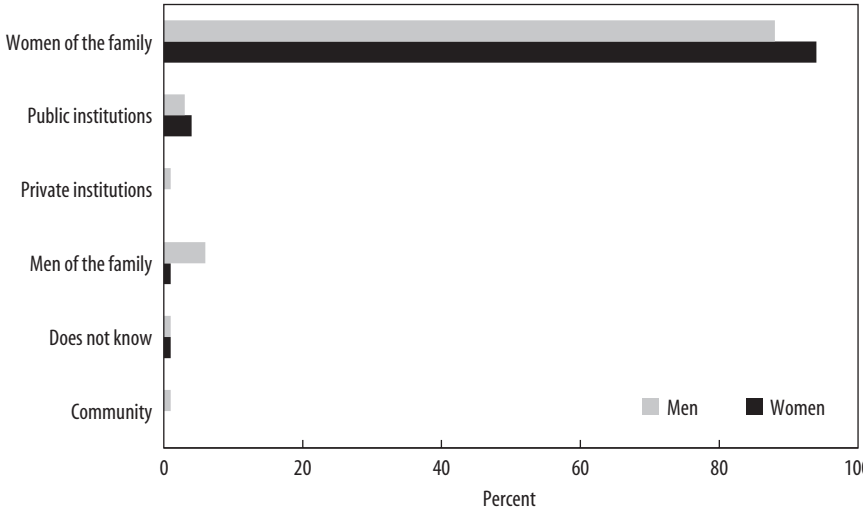
21. Arntz and others (2007).
22. ILO (2009).
23. Aguirre (2011); ILO (2009).

F I G U R E 4 . Hours per Week Spent in Paid and Unpaid Work



Source: Rico and Robles (2016).
Note: ARG, Argentina; BR, Brazil; COL, Colombia, CR, Costa Rica; ECU, Ecuador; GUA, Guatemala; MEX, Mexico; PAN, Panama; PER, Peru; URU, Uruguay.

FIGURE 5. Responses by Gender to the Question, "In Your Opinion, in Your Country of Residence, Who Is Mainly Responsible for the Care of Dependent People, Men or Women?"



Source: González, Raga, and Sibils (2012).
Note: Based on a survey answered by 544 opinion leaders in Latin America.

González, Raga, and Sibils establish that survey responses from 544 regional opinion leaders indicate consensus that the responsibility for care falls mainly on women, as shown in figure 5.[24]

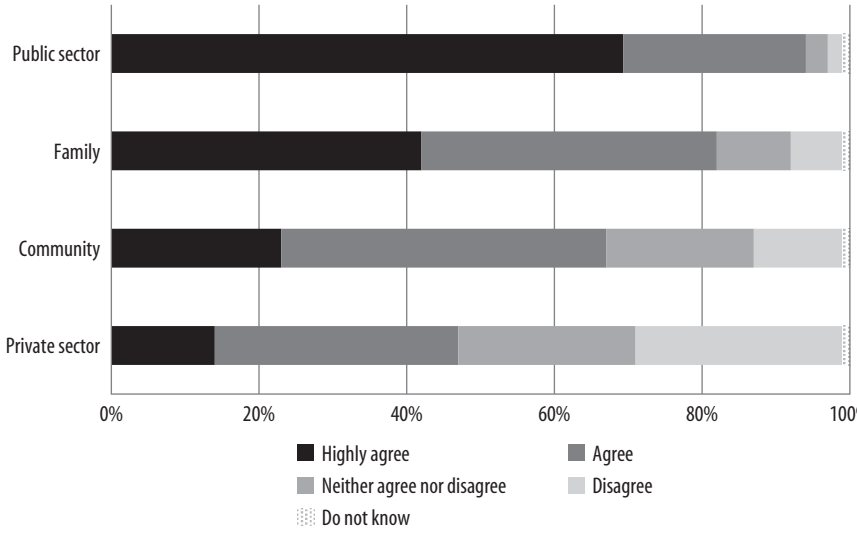
Having laid out a diagnostic of the state of LTC in Latin America, we turn to discuss the likelihood of LTC policies being put in place, as well as the most likely objectives for these policies.

The Room for LTC Policies

While the increased demand for LTC in the region has been documented, questions regarding government involvement remain unresolved. Any discussion of public LTC needs to address its financing. Barr makes the case that actuarial insurance is superior to self-insurance, and social insurance programs are superior to private ones, so there are benefits to instituting social insurance.[25] However, comprehensive LTC programs are probably not a priority in Latin

24. González, Raga, and Sibils (2012).
25. Barr (2010).

FIGURE 6. Attitude toward the Claim, "The Following Institution Could Be Involved in the Care of Dependent People"



Source: Authors' elaboration based on González, Raga, and Sibils (2012).
Note: Based on a survey answered by 544 opinion leaders in Latin America.

America for now. Basic pensions—to ensure that the elderly avoid poverty—are still on the region's to-do list, as are improvements to the health systems to achieve universal coverage and to enact health policies to deal with the increase in chronic noncommunicable diseases. Hence, LTC spending may be seen as a luxury compared with alternative uses of government funds. In addition, the design of LTC programs for workers in the formal sector who contribute to social security, as is done in traditional pension systems, would leave out the region's most socioeconomically disadvantaged groups, who often work in the informal sector and thus do not have access to social security.

On the other hand, as the senior population grows and the need for LTC becomes more prevalent in the region, the demand for and the social return of these programs will rise. How will policymakers react to this increased demand? As shown in figure 6, opinion leaders in the region think that the public sector should be involved in the care of dependent people, and policymakers are likely to respond with greater government involvement.

In addition to the normative issue of whether the government *should* launch LTC programs based on an analysis of social costs and benefits, a related

question is whether and when a government *will* do so, which demands a positive reasoning. As mentioned, governments can be expected to take an active stance as demand for LTC grows. Moreover, several factors in the policymaking process may speed the development of these programs. The fact that the region is early in its demographic transition implies that most of the costs of LTC programs would be deferred, and short-term political capitalization of programs is likely. Even if other policies might have higher social returns, the decision-making process will possibly lead to some sort of public intervention regarding elderly care in general and LTC in particular. These arguments lead us to believe that there is a large probability that LTC programs will be deployed sooner rather than later.

There are at least three vital aspects of LTC policy. The first is the setup of a normative framework for the provision of LTC services. The first goal of these norms is to set standards for LTC provision, such as defining the responsibilities of caregivers, the required training for each type of care, and so on. Regulation is also needed to facilitate a market for care, with a special focus on the supply side. These aspects are best addressed from the perspective of health economics, so we do not discuss them further in this paper.

The second aspect is to define a target population for LTC programs. While all people who reach a stage of dependency will need LTC, one key issue from a policy perspective is affordability. For dependents who can afford LTC, addressing regulatory aspects alone will improve their outlook. On the other hand, policies aimed at relieving the burden for families who cannot afford LTC will demand a more proactive stance from the government.

The third element is how to finance LTC, which we discuss separately for those who can afford care and those who cannot. For the former group, the literature indicates that actuarial insurance is superior to self-insurance, and social insurance programs are superior to private ones, as mentioned earlier.[26] Coverage of LTC insurance is typically very low, however, for multiple reasons. On the demand side, Colombo and others note that the complexity of insurance contracts makes it difficult for the insured to assess value for money, and there is skepticism as to whether people can actually make informed choices regarding insurance for LTC.[27] In addition, there is considerable evidence that the elderly prefer aging in their family homes, possibly leading to a lower demand for LTC insurance as a way to avoid

26. Barr (2010).
27. Colombo and others (2011); Barr (2010).

being sent to nursing homes by family members.[28] Finally, evidence shows that demand is very unresponsive to economic incentives.[29]

On the supply side, insurers face several problems that put pressure on costs, including moral hazard and adverse selection. However, these problems are common to practically all insurance markets, and they are unlikely to preclude the rise of an LTC insurance market. A more important factor is that LTC insurance providers face at least two sources of common shocks. The first is the possibility that unforeseen changes in life expectancy lead to relatively more or fewer years of dependency. The second is uncertainty regarding the future costs of care. It is generally believed that costs of labor-intensive tasks such as LTC will rise because productivity increases in these sectors lag those in the rest of the economy. However, this gap is difficult to predict. De la Maisonneuve and Oliveira Martins forecast that in OECD countries, costs could vary by as much as 5 percent of GDP, depending on the scenario.[30]

In addition, Latin American countries have a long history of macroeconomic instability, and the possibility of spikes in default on insurance payments should not be discarded. Moreover, compulsory take-up of LTC insurance would not be without additional problems. Mandatory take-up would be unlikely to reach workers in the informal economy, who typically account for over one-third of the labor force. Under universal pension programs, mandatory LTC insurance would be applicable, but take-up at such a late age would put pressure on premiums and decrease the disposable income of the elderly.

By comparison, social insurance schemes share many of the risks of private insurers. Increases in life expectancy or episodes of economic crises may generate a large mismatch between revenues and LTC spending. However, growth and technological progress should boost revenues, and this would probably be enough to cover increases in costs associated with Baumol's cost disease. All in all, it is not clear that private insurers have a competitive advantage over social insurance schemes. Furthermore, social insurance programs are the norm in advanced countries, and there are valuable insights to be gained from those experiences.

As for families who cannot afford care, we think this is a more natural starting point for thinking about LTC policies. One reason is that it is operationally

28. Pérez and others (2001); Olsberg and Winters (2005); Wiles and others (2012); Chomik and MacLennan (2014); Barr (2010).

29. Courtemanche and He (2009); Goda (2011); Bergquist, Costa-i-Font, and Swartz (2018); Brown, Coe, and Finkelstein (2007).

30. De La Maisonneuve and Oliveira Martins (2013).

advantageous to launch a small-scale program before putting more comprehensive programs in place. Moreover, policies in the region have put a great emphasis on relieving poverty, which is aggravated by the burden associated with LTC. Thus, LTC policies for the poor would be consistent with the present agenda and can leverage the institutional infrastructure and acquired know-how of other welfare programs.

As in any targeted program, LTC policies for the poor first require a targeting mechanism to identify who can and cannot afford LTC. Because a person's inherent wealth is largely unobservable, policymakers must rely on observable and verifiable characteristics, such as income, age, assets, and labor market status, to determine eligibility. This gives rise to a trade-off between inclusion and exclusion errors—the eligibility of people who should not have received the benefit and the ineligibility of people who should have received it.

In Latin America and the Caribbean, high informality largely impedes means testing as a targeting mechanism. However, most countries in the region implement conditional cash transfers to poor households, with eligibility based on proxy means tests. These are an improvement over alternative targeting mechanisms, but targeting challenges remain. Overall, the fitness of specific characteristics to evaluate affordability varies widely in different countries, and assessment should be done on a case-by-case basis.

Another element of any LTC program is an assessment of the level of dependency of potential beneficiaries, which varies according to the standards defined in each country and sets LTC programs apart from generic income support programs. Well-designed programs therefore require an objective and transparent beneficiary evaluation and the involvement of several actors, such as health care systems.

The structure of the public intervention itself is another consideration. The first option is for programs to subsidize the funding of an insurance fund (ex ante) or to cover expenses as they take place (ex post). In the first case, governments subsidize the take-up of private LTC insurance. However, as discussed above, it is not clear that LTC insurance has a competitive advantage over social insurance schemes, and ex ante insurance would take care of the next generation of the elderly, but not of the elderly in this generation. Moreover, even small copayments of LTC insurance are likely to deter low-income families, while it seems more likely that families will contribute to the cost of LTC in case they do need it. For these reasons, granting ex post subsidies in the event of LTC needs is presumably a more adequate element if LTC programs are designed for the poor.

In terms of financing, given the premise that the program is oriented toward poor families, we presume that LTC programs would be funded from general revenues. However, most Latin American countries today are subject to fairly tight fiscal constraints, and we expect LTC policies to have restricted budgets. Policymakers will therefore have to adopt schemes that maximize the cost-effectiveness of LTC programs.

A final consideration is whether subsidies are in-kind, cash, or a combination of the two. Programs granting cash subsidies seem appropriate to meet the dual goal of providing care and easing the financial burden on poor families. On the other hand, there may be cases in which cash transfers might be insufficient to provide adequate care—for example, if care is too complex to be provided by family members and unaffordable for them. Should this be the case, families would be better off with in-kind subsidies. We believe this is a central element in the design of an LTC program for the poor. Accordingly, we dedicate the next section to analyzing the effectiveness of cash-for-care and in-kind care programs for the poor. Our study yields clear conclusions regarding their overall welfare effect and overall program costs.

LTC Provision: A Simple Model

In this section, we develop a simple model to set the discussion of some features of an LTC system. We build a simple model that focuses on the effects of cash versus in-kind services, in the context of a targeted LTC program. Little attention has been given to the effects of LTC program design. One notable exception is Canta, Cremer, and Gahvari, who analyze the crowding out of family care as a result of LTC policies in the context of uncertain child altruism.[31]

Our model aims to deliver results on two main aspects. First, we set out to answer what type of subsidy is better suited for the poor and vulnerable, cash transfers or in-kind services. Second, since budget restrictions are an important constraining factor, the model is intended to identify how to boost the cost-effectiveness of this type of program. For the remainder of this section, we assume that the population of beneficiaries has already been selected, although we discuss this issue further in the next subsection.

To begin, we assume that each family has one individual who needs an amount x of care, where x represents the hours of care needed in a given time interval: the greater x is, the more attention the dependent family member

31. Canta, Cremer, and Gahvari (2016).

requires. The family purchases $x_m \geq 0$ units of care in the market at a price w_m and provides $x_f \geq 0$ units of care itself. We assume that x_m and x_f are perfect substitutes. This is a natural starting point for assessing LTC policies as, historically, formal LTC arrangements have taken the place of informal ones. It is also consistent with extensive empirical research that finds substitutability between formal and informal care.[32] Moreover, analyses based on exploiting regional variation in the availability of public programs in the United States show decreases in formal home care and increases in informal care in response to reductions in Medicare reimbursements.[33] We further discuss the effect of nonsubstitutability below.

Utility is defined at the family level and depends on income available for consumption of goods other than LTC, as well as utility from leisure. Family income is the product between the supply of work l and the market wage w_l. We assume that the market wage is different for each family so that we can study how behavior changes in different income groups. Moreover, we assume the wages belong to the interval $[\underline{w_l}, \overline{w_l}]$, with $\underline{w_l} < w_m < \overline{w_l}$. This implies that families can earn wages above or below the cost of care. In practice, we assume the upper bound on wages is not too much higher than w_m, as the program is targeted to the poor. To keep matters simple, we assume the utility function has the following Cobb-Douglas form:

$$u = \alpha \ln Y + (1-\alpha)\ln\left[\Omega - \left(l + x_f\right)\right],$$

which is subject to the following budget constraint:

$$Y = lw_l - x_m w_m,$$

where Y is income available for consumption and Ω is the maximum amount of time available, so that $\Omega - (l + x_f)$ is the amount of free time. Let us define this magnitude as L for leisure. We assume LTC needs are not high enough to take up all available time; that is, $\Omega > x$. Given the Cobb-Douglas form, this ensures a solution where some time is left for leisure and some for work. We can now define the family's utility maximization problem as

$$\alpha \ln Y + (1-\alpha)\ln\left[\Omega - \left(l + x_f\right)\right],$$

subject to $Y = lw_l - x_m w_m$, $x \leq x_m + x_f$, $l + x_f \leq \Omega$.

32. La Sasso and Johnson (2002); Van Houtven and Norton (2004); Bonsang (2009).
33. McKnight (2006); Golberstein and others (2009).

We can rewrite this problem as the following Lagrangian function:

$$\alpha \ln\left(lw_l - x_m w_m\right) + (1-\alpha)\ln\left(\Omega - l - x_f\right) + \lambda_x\left(x_m + x_f - x\right) + \lambda_\Omega\left(\Omega - l - x_f\right).$$

The first-order conditions to this problem are

$$(1)\quad \frac{\partial L}{\partial l} = \frac{\alpha}{Y}w_l - \frac{1-\alpha}{L} - \lambda_\Omega \le 0; \qquad l \ge 0; \qquad l\left(\frac{a}{Y}w_l - \frac{1-\alpha}{L} - \lambda_\Omega\right) = 0;$$

$$(2)\quad \frac{\partial L}{\partial x_f} = -\frac{1-\alpha}{L} + \lambda_x - \lambda_\Omega \le 0; \qquad x_f \ge 0; \qquad x_f\left(-\frac{1-\alpha}{L} + \lambda_x - \lambda_\Omega\right) = 0;$$

$$(3)\quad \frac{\partial L}{\partial x_m} = -\frac{\alpha}{Y}w_m + \lambda_x \le 0; \qquad x_m \ge 0; \qquad x_m\left(-\frac{\alpha}{Y}w_m + \lambda_x\right) = 0;$$

$$(4)\quad \frac{\partial L}{\partial \lambda_x} = x_m + x_f - x \ge 0; \qquad \lambda_x \ge 0; \qquad \lambda_x\left(x_m + x_f - x\right) = 0;$$

$$(5)\quad \frac{\partial L}{\partial \lambda_\Omega} = \Omega - l - x \ge 0; \qquad \lambda_\Omega \ge 0; \qquad \lambda_\Omega\left(\Omega - l - x\right) = 0.$$

As mentioned, our assumptions ensure that $l + x_f \le \Omega$, so we disregard the fifth first-order condition.

The solution to this problem depends on the relevant parameters for the family in question. The following result shows that the decision to hire care or provide it by the family depends crucially on the relation between w_l and w_m.

—*Lemma 1*.

(i) Assume that the market wage for a family is higher than the cost of buying care in the market: $w_l > w_m$; then the family does not provide any care directly ($x_f = 0$) and purchases all the necessary care in the market ($x_m = x$).

(ii) Assume that the market wage for a family is lower than the cost of buying care in the market: $w_l < w_m$; then the family does not buy care services ($x_m = 0$) and delivers all the necessary care itself ($x_f = x$).

(iii) Assume that the market wage for a family is equal to the cost of buying care in the market: $w_l = w_m$; then the family may buy care in the market ($x_m \ge 0$), provide it directly ($x_f \ge 0$), or both (with $x_f + x_m = \mathrm{x}$).

—*Proof of Lemma 1*. See the appendix in Caruso, Galiani, and Ibarrarán.[34]

Our results indicate that the choice between family-based care and market care depends on the relation between the family's wage and the cost of buying care in the market. Families whose least productive member can earn a higher wage than the cost of hiring care will hire the services from the market, while poorer families will provide care services themselves. This is because families with low wage rates have a lower opportunity cost of providing care, so they would rather provide care themselves. In doing so, it is as if the family could receive a wage rate w_m for the first x units of work. In contrast, families with income above w_m would rather hire paid caregivers and work for wages.

Most families choose only one type of care because family care is a perfect substitute for market care and the disutility of family caregiving is the same as working for wages. We could add imperfect substitutability between family care and market care, or we could suppose that the productivity of family care is decreasing, for example because the care needed by the patient becomes more complex or specialized. In these cases, the possibility that the families opt for a mix of market and family care would become more likely. However, the principle that richer families would rely more on market care and poorer families on family care still holds, so there is little to learn in our model from relaxing these assumptions. We discuss this issue further in the next subsection.

We now include public subsidies, studying first the effect of in-kind subsidies. We assume the family receives s units of care, where $s \leq x$. We also implicitly assume that the institution granting the subsidy can observe the value of x. This assumption is plausible if the value of x can be inferred by examining the dependency level of the beneficiary. In a more realistic setting, the agency responsible for the LTC may only observe a noisy indicator of x, or the dependent may influence the value of x reported. We comment on these possible extensions in the following section. For now, we continue assuming that x is observable. We do not assume any particular structure for s, although it could be a fixed value for all families or it could depend on x (but not on x_m or x_f). We disregard the restriction $l + x_f \leq \Omega$, since we know it is nonbinding. Now the utility maximization problem is

$$\alpha \ln(lw_l - x_m w_m) + (1-\alpha)\ln L + \lambda_x\left[x_m + x_f - (x-s)\right].$$

34. Caruso, Galiani, and Ibarrarán (2017).

The structure of the problem is essentially unaltered. All we have done is reduce the amount of care the dependent requires. However, the choice of how to provide care has not changed. We state this formally in the following result.

—*Lemma 2*. In the presence of an in-kind subsidy where $s \leq x$, such that care equivalent to $x - s \geq 0$ must still be provided, this level of care is provided following the three rules of lemma 1.[35]

What, then, is the effect of the subsidy? Poor families must now provide less care themselves, so the marginal cost of working is lower. This implies that they spend more time working for wages, and they accommodate the extra time available in a mix between increased leisure and disposable income. Rich families must now pay for less care themselves, freeing up part of their income. Since the marginal utility of income is decreasing, their behavior adjusts by decreasing work and enjoying more leisure.

Next, we assume the subsidy is in cash. To keep both types of subsidies comparable, we assume that the subsidy is $S = s\, w_m$; that is, the subsidy equals the cost of the in-kind subsidy provided earlier and is thus the same for all families. The utility maximization problem is now

$$\alpha \ln(lw_l + S - x_m w_m) + (1-\alpha)\ln L + \lambda_x\left[x_m + x_f - x\right].$$

Again, the structure of the problem has not changed very much, and lemma 1 will also hold.

—*Lemma 3*. In the presence of a cash subsidy S such that $S \leq x\, w_m$, and assuming the subsidy or the LTC needs are not large enough to discourage work altogether in the case $w_l < w_m$, the three rules of lemma 1 hold.[36]

In comparison to the previous lemmas, the results of lemma 3 are altered somewhat by the possibility that LTC needs are so high that the disutility of providing care is high enough to generate a positive value of x_m. However, this also implies that $l = 0$, so families rely only on the subsidy to pay for care and for their own consumption. These implications are unrealistic, as it is more reasonable to expect families to work at least a minimum amount. Moreover, this case would require LTC needs to be catastrophic, in the sense that x would be rather close to Ω.[37] In what follows, we assume this case in

35. For the proof of lemma 2, see Caruso, Galiani, and Ibarrarán (2017, appendix).
36. For the proof of lemma 3, see Caruso, Galiani, and Ibarrarán (2017, appendix).
37. See the mathematical appendix in Caruso, Galiani, and Ibarrarán (2017) for greater detail.

only an extreme example, taking lemma 1 as the most likely rules by which care is provided.

If the rules according to which families make decisions have not changed, how does the cash subsidy differ from the in-kind subsidy? One aspect in which the two regimes differ is in their effect on labor supply. Poor families respond to the in-kind subsidy by working more, because care reduced the marginal disutility of labor. In the case of cash subsidies, however, poor families reduce their labor supply. This is because the subsidy increases their income, and the marginal utility from working falls. Therefore, poor families respond to the cash subsidy by working less than they would without any subsidies. The same happens for rich families: increased income reduces the marginal utility of labor, so the labor supply is reduced.

Another interesting dimension is the welfare change induced by both types of subsidy policies. For rich families, the policies differ in the amount of care they hire themselves. With the in-kind subsidy, they would hire $x - s$ units of care, while they hire x units with the cash subsidies. We can prove that this difference of behavior implies no welfare change.

—*Lemma 4*. For families with $w_l > w_m$, an in-kind subsidy s and a cash subsidy $S = s\, w_m$ are equivalent in terms of welfare.[38]

We have shown that rich families are indifferent between the two types of subsidies. The reason is that care is provided at the market price regardless of the form of the subsidy.

For poor families, however, the type of subsidy does affect the type of care delivered. Under the cash subsidy, all the care is provided by the family. Under the in-kind subsidy, on the other hand, only a fraction of the care is provided by the family. We can prove that imposing this restriction makes poor families worse off with the in-kind subsidy when compared to the cash subsidy, as they forgo the surplus created by the $w_m - w_l > 0$ differential.

—*Lemma 5*. For families with $w_l < w_m$, a cash subsidy S is preferable to an in-kind subsidy $s = S/w_m$.[39]

The previous result shows that cash subsidies are preferable to in-kind subsidies, for poor families. The reason is that, unlike what happens with rich families, in-kind subsidies do affect the price at which poor families provide

38. For the proof of lemma 4, see Caruso, Galiani, and Ibarrarán (2017, appendix).
39. For the proof of lemma 5, see Caruso, Galiani, and Ibarrarán (2017, appendix).

care. For poor families, the cost of providing care themselves is lower than market price, hence their utility gain. This should not come as a surprise since, as the previous proof shows, it is only an application of the revealed preference theorem.

Our results show that cash subsidies are as good as in-kind subsidies for rich families and better for poor families. The question, then, is whether there is a rationale for in-kind subsidies at all. We now show that when families have different valuations for the in-kind subsidy, a set of menu contracts in which one provides in-kind subsidies and another provides cash subsidies can attain the same welfare effect as an in-kind-only program, but at a lower cost. From this point on, we will refer to those families with $w_l < w_m$ as low-valuation families and those families with $w_l > w_m$ as high-valuation families.

In our model, the different valuation for the in-kind subsidy is given by differences in income level, as families with lower income are more likely to have a market wage smaller than the cash transfer. Nevertheless, when interpreting the results, we focus on the differences in the families' valuation, and not on the differences in their income levels, since these results apply to *any* source of heterogeneity in valuation. For example, valuation of in-kind services could be related to the complexity of care required, with families preferring in-kind services for more complex care. We return to this issue in the next subsection.

—*Lemma 6.* Let $U_{ic}(S)$ be the indirect utility function with a cash subsidy S and $U_{ik}(s)$ be the indirect utility function with an in-kind subsidy $s = S/w_m$. For families with $w_l < w_m$, there exists a unique $S^* < S$ such that $U_{ic}(S^*) = U_{ik}(s)$.[40]

This result implies that the low-valuation families are willing to accept a discount in exchange for the subsidy being in cash. High-valuation families would not, however, because they are indifferent between the two types of subsidies if the value is the same in terms of market units of care. The core of this result does not stem from the fact that different families have different income levels. Instead, it arises because families have a different *valuation* of the in-kind subsidy. Because low-valuation families can provide care at a lower cost, their valuation of the in-kind subsidy is low. Naturally, the opposite is true for families with $w_l > w_m$.

40. For the proof of lemma 6, see Caruso, Galiani, and Ibarrarán (2017, appendix).

This result explains why several LTC programs are designed as menu contracts where beneficiaries can choose between an in-kind subsidy and a cash transfer with a discount. One contract, designed for families with a higher valuation for care, would include an in-kind subsidy, while the other would offer a cash transfer with a lower value. Since the high-valuation families would use the cash subsidy to purchase care, they would rather choose the more valuable in-kind subsidy. The low-valuation families, however, would choose the cash subsidy, because its value is greater than the cost of providing care themselves. Again, this kind of result has been well studied within economics: it is an application of a discriminating monopoly where valuation of the good is unobservable.

There may be some concern that our results, though useful, depend too strongly on our simplistic assumptions. Moreover, there are several possible ways in which to extend the model. We therefore dedicate the following subsection to discussing the robustness of the results and possible extensions.

Robustness, Extensions, and Discussion of the Results

We have built a simple, tractable model to assess the effect of several variables on the decision of how to provide care. Our model was motivated by two conjectures. First, LTC programs will be deployed in the region in a reasonably near future. Second, there are obstacles to universal programs, so targeting those who cannot afford LTC seems like a reasonable program objective. Although we have discussed the reasonableness of these hypotheses, we have otherwise taken them to be true. In what follows, we discuss our results more generally and address whether they are relevant outside of this setting.

Our model indicates that the type of care provided depends crucially on the family's income level. Relatively poor families have a low opportunity cost of providing care and choose to provide it themselves, whereas those who are somewhat better off choose to work for wages and spend some of this money on hiring care.

A point to be raised against the setup of the model is that families cannot supply care at the market rate w_m. This is harmful for poor families, which could increase their income if this wage level were available to them. But families do have working opportunities, be it in the care sector or otherwise, so our model is analogous to one in which there are some costs to providing formal care on the market. These costs could derive from regulations and standards governing the provision of LTC, which would inevitably generate

some sort of operating expense for suppliers. Though a regulatory framework is necessary for the LTC market, this reasoning shows that excessive regulation is likely to have a regressive effect.

Our results indicate a few main points to explore further, the first being the preference for cash subsidies. This comes as no surprise, since an inclination toward lump-sum transfers is well established in economics. In the context of our model, the motivation behind the simultaneous existence of cash and in-kind subsidies is nontrivial, since these allow for a screening design that would be impossible with either type of subsidy alone, and it contributes to a reduction in the overall cost of the program. We have argued that poor families have a strict preference for cash, and this preference implies a willingness to accept it at a discount, which naturally translates into cost savings.

In practice, however, policymakers are more likely to opt for in-kind subsidies, for a variety of reasons. For example, the general public may be more receptive to the provision of in-kind subsidies than cash because of paternalistic preferences, distrust in the use of money by the cash subsidy recipients, or a belief that in-kind care is subject to higher standards and is of better quality than care bought in the market. To address the quality-of-care issue, many countries offer training and support programs to family caregivers. Additionally, the government, or any other institution in charge of hiring care, could receive sizable discounts by purchasing large amounts of care.

In addition, there is reason to believe that in-kind and cash subsidies are different in several political economy aspects. The management of in-kind subsidies probably requires a larger administrative structure, and it affects the visibility of officials in charge of LTC programs. Moreover, the greater the involvement of the public sector in LTC, the greater the benefit of political capture and clientelism. Finally, as discussed earlier, regulation is a necessary aspect of LTC policies, and the possibility that it may be affected by the interests of particular stakeholders is a legitimate concern.

The effect of differences in income levels between families is that these families have different valuations for in-kind services. Those with higher incomes prefer in-kind subsidies because they have a higher valuation of this service, not because they are rich. However, those with low incomes prefer cash subsidies because they have a low valuation of the in-kind subsidies. The result by which menu contracts permit lower program costs is robust to any source of differential valuation. For example, if families valued in-kind services differently because of clinical (for example, different degrees of disability or complexity of treatment), social (for example, reluctance to accept care from family members), or economic reasons, the cost-saving result would

remain unchanged. This result is analogous to a discriminating monopoly that cannot observe the individual valuation of the good it provides; the design of menu contracts lets families self-select themselves into categories based on their differences in valuation.

Another result yielded by our model is that families respond differently to in-kind subsidies based on their income level. While in-kind subsidies loosen the budget constraint for better-off families, poor families benefit from a relaxation of their time constraints. Therefore, the former decide to work *less* as a result of an income effect, while the latter decide to work *more* as a response to the fall in the disutility of working. However, in the case of cash subsidies, both types of families receive the same income effect and respond by working less.

The results regarding labor supply must be put in the context of this simplified model. The effects on labor supply are actually a secondary feature of the model, and it is not clear that they would prevail in a more realistic characterization of the household structure, the labor market, and the technology for producing household services. For example, if LTC has significant economies of scope with other household activities, in-kind subsidies are unlikely to free up much time to allow for large increases in labor supply. Moreover, changes in labor supply seem less likely under rigid labor market contracts. If there are costs associated with labor market exit and entry, low-income individuals may stay in the labor force even if it is not economical in the short run. Additionally, people with more limited access to the labor market will probably provide care if selection on the decision is possible. These considerations deserve additional empirical research.

Moreover, our model has assumed that family care is a perfect substitute for market care. Although preliminary evidence indicates that formal care and informal care are interchangeable, this does not hold for high levels of disability.[41] Research on South Korea indicates that formal and informal care are substitutes in the intensive margin but not in the extensive margin.[42] The demand for formal or for informal care also responds differently to the use of assistive technologies (ATs).[43] Agree and others find that ATs substitute

41. Bonsang (2009); Litwin and Attias-Donfut (2009).

42. Kim and Lim (2015).

43. The United States' Assistive Technology Act of 1988 defines assistive technologies as "any product, device, or equipment, modified or customized, that is used to maintain, increase, or improve the functional capabilities of individuals." The World Health Organization has a similar definition (see www.who.int/disabilities/technology/en/).

informal care but complement formal care.[44] Anderson and Wiener find that the effect depends on the type of AT.[45] Overall, they find that ATs relieve the need for informal care but do not significantly reduce the amount of formal and paid care.

Under imperfect substitution, the choice of in-kind subsidies would be more frequent for low-income families. Additionally, we have paid little attention to family structure. We could assume that an elderly spouse is ill-equipped for certain tasks, such as assisting the dependent person with movement or bathing. Relaxing the assumption of substitutability will likely bias the family/market mix in favor of the latter.

In addition, we have assumed that the agency that is responsible for the LTC program can adequately assess the level of dependency, x. However, it is likely that agencies will not observe x directly but rather will observe a noisy version of it, such as $x' = x + e$. To the extent that the factor e is exogenous and that the agency knows the joint distribution of x and e, $F(x, e)$, the agency can infer the distribution of noise for an observed x' level, $F(e|x')$. This will lead the agency to apply a discount factor that depends on this inferred distribution. On the other hand, if dependents can influence the reported level of x' at some cost (that is, e is endogenous), and if there is some utility to overreporting (for example, because caregivers help with household tasks other than LTC), then families will overreport dependency to the point that marginal costs match marginal gains from LTC programs.

Assuming families value e less than care, menu contracts like the ones described in the previous section can alleviate the problem of information asymmetry. Under exogenous e, an LTC program will generate a screening mechanism, where differences in valuation stem from the share of e in x': the larger e for a given x', the lower the value of x_s and the larger the discount the family is willing to accept. Under endogenous e, and assuming overreporting generates a cost $c(e)$ with $c' > 0$, $c'' > 0$, the setup generates a signaling equilibrium, where some families overreport to show they have a high valuation while other families do not overreport to avoid the cost $c(.)$ and simply take the discounted cash subsidy. As was the case in the previous section, the design of menu contracts lowers the overall cost of LTC programs. However, unlike in the previous section, menu contracts limit the allocation of LTC care toward less productive tasks, addressing an inefficiency of a different nature.

44. Agree and others (2005).
45. Anderson and Wiener (2013).

Finally, we have assumed that the costs of LTC are limited to the cost of providing care, and that the wage level for the family is given. In a dynamic setting, the anticipation of having to provide care in the future may have an effect on human capital acquisition and future earnings. This is more likely if there are rigid labor regulations that make it harder for families to reduce their working hours to make time for LTC. Moreover, if such dynamic incentives exist, it may become necessary to extend LTC programs beyond the poor, shifting toward universal programs to avoid distortions of LTC programs on the intertemporal wage distribution.

Concluding Remarks

Although Latin America is aging quickly, policy discussions about the many consequences of this process are limited. The available evidence indicates that the demand for LTC will soar as this process unfolds, not only because the demand for LTC naturally grows with an aging population but also as the result of a lack of significant progress in living standards and old-age health status. Ours is among the first studies to present evidence on aging, theoretical and policy discussions based on LTC policies in developed countries, their application to the region, and a formal model to help guide the debate on the type of LTC policies that are feasible for the region.

The theory and empirical evidence on the matter show that private markets are ill-equipped to grant insurance beyond specific population groups. As a result, most advanced countries have implemented public social insurance programs. In contrast, although most countries have advanced regulations and laws protecting the elderly and encouraging healthy and active aging, and some apply programs to support the elderly, comprehensive LTC policies are nonexistent in Latin America (with the recent exception of Uruguay, which has designed but has yet to implement an LTC system). This means that families must rely on other arrangements to provide care, and the existing evidence shows that families in the region rely very little on remunerated care. The duty falls on family members, with women being the primary caregivers.

As the demand for care rises and the issue of LTC becomes more visible, we expect policymakers to propose programs designed to guarantee care. One of the reasons has to do with political economy concerns. As is the case with any long-term public expenditure program, the bulk of costs associated with LTC will happen in the future, allowing for short-run political capitalization. Another reason is that LTC programs can follow poverty alleviation program

schemes. Typically, poverty alleviation programs acknowledge that the living standards of certain population groups are below acceptable standards, and public programs aim to fill this gap. In this context, the need for LTC would be understood as an aggravating circumstance, which requires additional assistance from governments.

In view of this possibility, we study the effect of several subsidy schemes by means of a formal model. Our model yields several interesting insights. The first is the positive association between poverty and a preference for cash subsidies. Disadvantaged households have lower opportunity costs and therefore find it more affordable to provide care themselves than to hire a caregiver at market rates. This result indicates that cash subsidies are likely to be a better match for poverty-alleviation LTC programs. Additionally, in programs where eligible families have varying affordability thresholds, granting the option of in-kind or cash programs is likely to reduce the overall cost of the program, as people with lower valuation of in-kind programs are willing to accept cash programs at a discount.

This result is robust to several settings in which families differ in their valuation of in-kind care. Some relevant cases that generate differences in valuation of care are differences in the type of care or severity of disability, noisy observation of disability, and endogenous overreporting of the disability level. In all these cases, LTC program administrators can use menu designs to filter families with high and low valuation and reduce program costs.

Moreover, LTC may have an adverse effect on the process of human capital acquisition. This problem is aggravated if workers cannot adjust their working load in the event of having to provide LTC for a family member. To the extent that this is true, relieving families of the burden of LTC would have positive dynamic effects. In addition, this setting possibly implies that there are benefits from broadening LTC programs beyond just the poor.

In the end, the issue of LTC will move further into the policy agenda in the medium run. We hope to have contributed by broadening the discussion and presenting our model regarding the welfare effect of LTC programs.

References

Agree, Emily M., Vicki A. Freedman, Jennifer C. Cornman, and others. 2005. "Reconsidering Substitution in Long-Term Care: When Does Assistive Technology Take the Place of Personal Care?" *Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 60(5): S272–80.

Aguirre, Rosario. 2011. "El reparto del cuidado en América Latina." In *El trabajo del cuidado en América Latina y España*, edited by María Ángeles Durán, pp. 89–104. Madrid: Fundacion Carolina.

Al Snih, Soham, James E. Graham, Yong-Fang Kuo, and others. 2010. "Obesity and Disability: Relation among Older Adults Living in Latin America and the Caribbean America." *Journal of Epidemiology* 171(12): 1282–88.

Anderson, Wayne L., and Joshua M. Wiener. 2013. "The Impact of Assistive Technologies on Formal and Informal Home Care." *Gerontologist* 55(3): 422–33.

Arntz, Melanie, Alexander Spermann, Susanne Steffes, and Sarah Widmaier. 2007. "The German Social Long-Term Care Insurance: Structure and Reform Options." IZA Discussion Paper 2625. Bonn: Institute of Labor Economics (IZA).

Barr, Nicholas. 2010. "Long-Term Care: A Suitable Case for Social Insurance." *Social Policy and Administration* 44(4): 359–74.

Bergquist, Savannah, Joan Costa-i-Font, and Katherine Swartz. 2018. "Long-Term Care Partnerships: Are They 'Fit for Purpose'?" *Journal of the Economics of Ageing* 12(C): 151–58.

Bonsang, Eric. 2009. "Does Informal Care from Children to Their Elderly Parents Substitute for Formal Care in Europe?" *Journal of Health Economics* 28(1): 143–54.

Brown, Jeffrey R., Norma B. Coe, and Amy Finkelstein. 2007. "Medicaid Crowd-out of Private Long-Term Care Insurance Demand: Evidence from the Health and Retirement Survey." *Tax Policy and the Economy* 21: 1–34.

Canta, Chiara, Helmuth Cremer, and Firouz Gahvari. 2016. "Maybe 'Honor Thy Father and Thy Mother': Uncertain Family Aid and the Design of Social Long-Term Care Insurance." Working Paper 16-685. Toulouse School of Economics.

Caruso, Martín, Sebastian Galiani, and Pablo Ibarrarán. 2017. "Long-Term Care in Latin America and the Caribbean? Theory and Policy Considerations." NBER Working Paper 23797. Cambridge, Mass.: National Bureau of Economic Research.

Chomik, Rafal, and Mary MacLennan. 2014. "Aged Care in Australia, Part I: Policy, Demand, and Funding." Research Brief 2014/01. Sydney: Center of Excellence in Population Aging Research.

Colombo, Francesca, Ana Llena-Nozal, Jérôme Mercier, and Frits Tjadens. 2011. *Help Wanted? Providing and Paying for Long-Term Care.* OECD Health Policy Studies. Paris: Organization for Economic Cooperation and Development.

Courtemanche, Charles, and Daifeng He. (2009). "Tax Incentives and the Decision to Purchase Long-Term Care Insurance." *Journal of Public Economics* 93(1): 296–310.

de La Maisonneuve, Christine, and Joaquim Oliveira Martins. 2013. "A Projection Method for Public Health and Long-Term Care Expenditures." OECD Economics Department Working Paper 1048. Paris: Organization for Economic Cooperation and Development.

Goda, Gopi S. 2011. "The Impact of State Tax Subsidies for Private Long-Term Care Insurance on Coverage and Medicaid Expenditures." *Journal of Public Economics* 95(7): 744–57.

Golberstein, Ezra, David C. Grabowski, Kenneth M. Langa, and Michael E. Chernew. 2009. "Effect of Medicare Home Health Care Payment on Informal Care." *INQUIRY: The Journal of Health Care Organization, Provision, and Financing* 46(1): 58–71.

González, Luis E., Adriana Raga, and Matías Sibils. 2012. "Consulta de opinión sobre políticas de cuidado de personas dependientes en América Latina: niñas y niños, personas ancianas, personas con discapacidad y personas con enfermedades crónicas." Observatorio de Igualdad de Género de América Latina y el Caribe Report 35375. Santiago, Chile: Economic Commission for Latin America and the Caribbean (ECLAC).

Hauschild, Reinhard. 1994. "Soziale Pflegeversicherung: Vorschläge und Konzeptionen." *Bundesarbeitsblatt* 45(8–9): 12–21.

ILO (International Labour Organization). 2009. "Envejecimiento de la población ¿Quién se hace cargo del cuidado?" Notas OIT: Trabajo y Familia 8. Lima.

Kim, Hyuncheol B., and Wilfredo Lim. 2015. "Long-Term Care Insurance, Informal Care, and Medical Expenditures." *Journal of Public Economics* 125 (May): 128–42.

Kinsella, Kevin G., and David R. Phillips. 2005. "Global Aging: The Challenge of Success." *Population Bulletin* 60(1): 3–42.

La Sasso, Anthony, and Richard Johnson. 2002. "Does Informal Care from Adult Children Reduce Nursing Home Admissions for the Elderly?" *INQUIRY: The Journal of Health Care Organization, Provision, and Financing* 39(3): 279–97.

Litwin, Howard, and Claudine Attias-Donfut. 2009. "The Inter-Relationship between Formal and Informal Care: A Study in France and Israel." *Aging and Society* 29(01): 71–91.

Matus-López, Mauricio. 2015. "Thinking about Long-Term Care Policies for Latin America." *Salud Colectiva* 11(4): 485–96.

McEniry, Mary. 2013. "Early-Life Conditions and Older Adult Health in Low- and Middle-Income Countries: A Review." *Journal of Developmental Origins of Health and Disease* 4(1): 10–29.

McKnight, Robin. 2006. "Home Care Reimbursement, Long-Term Care Utilization, and Health Outcomes." *Journal of Public Economics* 90(1): 293–323.

Medici, André C. 2011. "How Age Influences the Demand for Health Care in Latin America" In *Population Aging: Is Latin America Ready?*, edited by Daniel Cotlear, pp. 135–90. Washington: World Bank.

Monteverde, Malena, Kenya Noronha, and Alberto Palloni. 2009. "Effect of Early Conditions on Disability among Elderly in Latin America and the Caribbean." *Population Studies* 63(1): 21–35.

OECD (Organization for Economic Cooperation and Development). 2015. *Health at a Glance 2015: OECD Indicators.* Paris.

Olsberg, Diana, and Mark Winters. 2005. "Ageing in Place: Intergenerational and Intrafamilial Housing Transfers and Shifts in Later Life." Final Report 88. Melbourne: Australian Housing and Urban Research Institute.

Palloni, Alberto, and Laetícia Souza. 2013. "The Fragility of the Future and the Tug of the Past: Longevity in Latin America and the Caribbean." *Demographic Research* 29(21): 543.

Palloni, Alberto, Mary McEniry, Rebeca Wong, and Martha Pelaez. 2006. "The Tide to Come: Elderly Health in Latin America and the Caribbean." *Journal of Aging and Health* 18(2): 180–206.

Pérez, Fermina Rojo, Gloria Fernandez-Mayoralas Fernandez, Enrique Pozo Rivera, and Jose Manuel Rojo Abuin. "Ageing in Place: Predictors of the Residential Satisfaction of Elderly." *Social Indicators Research* 54(2): 173–208.

Rico, María Nieves, and Claudia Robles. 2016. "Políticas de cuidado en América Latina: forjando la igualdad." Asuntos de Género Working Paper 140. Santiago, Chile: Economic Commission for Latin America and the Caribbean (ECLAC).

United Nations. 2015. *World Population Prospects: The 2015 Revision.* New York.

Van Houtven, Courtney H., and Edward C. Norton. 2004. "Informal Care and Health Care Use of Older Adults." *Journal of Health Economics* 23(6): 1159–80.

WHO (World Health Organization). 2016. "Global Health Observatory." Geneva.

Wiles, Janine, Annette Leibing, Nancy Guberman, and others. 2012. "The Meaning of 'Aging in Place' to Older People." *Gerontologist* 52(3): 357–66.