

Cost Simulation Tool for Long-Term Care Systems: An application to Latin America and the Caribbean

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Social Protection and Health
Division

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Cost Simulation Tool for Long-Term Care Systems



An application to
Latin America and the Caribbean

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Cost Simulation Tool for Long-Term Care Systems: An application to Latin America and the Caribbean

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Abstract

The cost simulation tool for long-term care systems provides a way to estimate how much it would cost governments in Latin America and the Caribbean to implement this type of system. The simulation tool is meant to assist policymakers as they decide who will receive support from the system and what type of services they will receive.

This technical note explains what the cost simulation tool is and how to use it. Essentially, it is an Excel file that can be used to apply the bottom-up cost model used for Mexico in González-González et al. (2019) and discussed in Cafagna et al. (2019). It is useful because it allows users to create service packages based on their preferences and quickly see how much a system that offers that package would cost. Users can then compare service packages and see how costs would change in the future.

This technical note concludes with an exercise where the cost simulation tool is applied to seven Latin American countries using the same parameters. The results show that a long-term care system with a relatively generous package of services and with universal coverage for adults over age 60 would cost governments between 0.5% and 1.0% of gross domestic product.

JEL Classification: H5, I18, J14, J18

Keywords: aging, population aging, care dependence, long-term care, social inclusion, Latin America and the Caribbean

¹ Nadin Medellín is a consultant for the Social Protection and Health Division of the Inter-American Development Bank. For questions about this publication and about the possibility of further adapting the cost simulation tool, for instance to focus on a specific region within a country or use a different age structure, readers can send their questions to: nadinm@iadb.org or pibarraran@iadb.org.

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This technical note forms part of an agenda that aims to close knowledge gaps among those in charge of creating public policy on long-term care and assistance in Latin America and the Caribbean. The Inter-American Development Bank web portal Panorama of Aging and Long-Term Care (<https://www.iadb.org/en/panorama/panorama-aging>) centralizes the publications for this agenda and other resources like online seminars on these issues.

This technical note builds on previous publications that include Aranco et al. (2018), which estimates the prevalence of care dependence among older people in the region's countries; Medellín et al. (2018), which systematizes lessons learned for designing and implementing care systems; and Caruso, Galiani, and Ibarrarán (2017), which weighs the pros and cons of in-kind services versus cash transfers. It also draws on a series of in-depth case studies on the demand for long-term care services, legal framework, and supply of services in Argentina (Oliveri, forthcoming), Colombia (Aranco et al., 2018), Chile (Molina et al., forthcoming), Costa Rica (Medellín et al., 2019), Mexico (López-Ortega & Aranco, 2019) and Uruguay (Aranco & Sorio, 2018). The work of González-González et al. (2019), which applied the cost model for long-term care systems to Mexico and projected long-term care rates for the country, also laid the groundwork for this note, as did a global review by Aranco and Ibarrarán (2020) of home care services, with an emphasis on Latin America.

All of these documents are reflected in the Inter-American Development Bank's flagship publication *Age with Care: Long-term Care in Latin America and the Caribbean* (Cafagna et al., 2019), which also offers specific recommendations for Latin American and Caribbean countries seeking to design and implement a long-term care system.

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Introduction

This technical note explains what the cost simulation tool is and how to use it to estimate how much it would cost governments to implement long-term care systems in Latin America and the Caribbean. It is complemented by a section in which the tool is applied to seven of those countries.

According to the World Health Organization (WHO), **long-term care systems** are “national systems that aim to provide integrated long-term care that is appropriate, affordable, accessible and upholds the rights of older people and caregivers alike” (WHO, 2017). This and other Inter-American Development Bank publications (for example, Cafagna et al., 2019) also use the WHO definition of **long-term care services**, which are the activities undertaken by others to ensure that care-dependent people can maintain a level of functional ability consistent with their basic rights, fundamental freedoms, and human dignity (WHO, 2015). According to the WHO (2015a), people are considered **care-dependent** when for an extended period of time they have difficulty performing activities of daily living and need help from others. These include basic activities of daily living (BADL), which are those necessary for living independently, like eating, showering or bathing, and using the toilet. Also relevant are the instrumental activities of daily living (IADL), which are related to cognitive aspects and social relationships. Examples include shopping, cooking, doing housework, managing money, and using the telephone. [Appendix 1](#) contains a more in-depth discussion on this topic.

The main purpose of the simulation tool is to help policymakers design a long-term care system, especially when deciding which services the system will offer and who will receive them. The simulation tool allows users to quickly see how costs change based on coverage and the type of services provided, which may be especially useful in the context of budgetary limitations.

The simulation tool consists of an Excel file designed to apply the model for estimating the costs of a long-term care system presented in Cafagna et al. (2019) and implemented in González-González et al. (2019). It allows users to modify the strategic parameters and compare different scenarios and their medium-term implications.

Under this model for estimating costs, the annual government expenditure required for a long-term care system depends on the number of recipients of the services multiplied by the annual cost of the services, plus the system’s administrative costs. The number of system beneficiaries is a function of the size of the care-dependent population and the governments’ eligibility criteria, adjusted by the desired coverage levels. Meanwhile, the annual cost of services is derived from the cost of each service covered by the system multiplied by the number of recipients.

The cost simulation tool contains information on the demographic structure of the population, the care dependence rate, and the costs of long-term care services. Users of the tool should set two public policy parameters that are key when funding is limited: who

the system's recipients are and what services they receive. These are complex decisions—when resources are scarce, there is tradeoff between covering as many people as possible and funding the most costly services. Decision-makers may also have to consider establishing care priorities based on, for example, the severity of care dependence, or designing tiered support based on recipients' income levels.

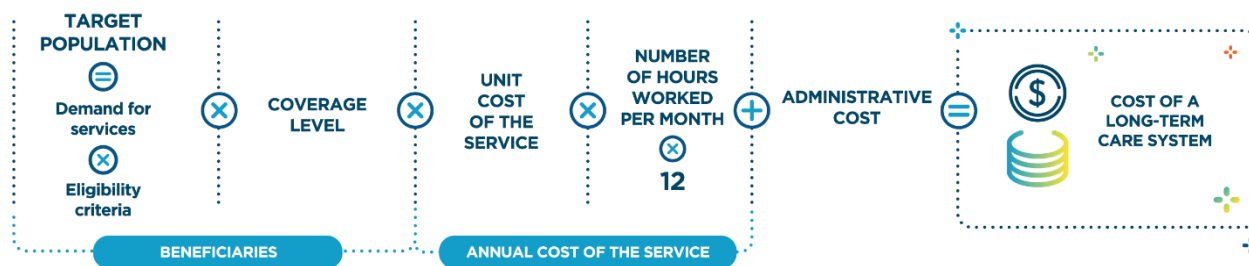
When the model is applied to seven countries, the results show that the cost of a long-term care system could range from 0.5% to 1.0% of GDP, based on a generous package of services with universal coverage for older people. This means that for the region, the public investment required would be less than the OECD average of 1.7% of GDP (Cafagna et al., 2019: 35).

This document is divided into five sections. The first describes the model used to simulate costs. The second discusses the types of decisions the cost simulation tool can be used to help make. The third provides guidelines on how to use the cost simulation tool. Section 4 applies the cost simulation tool to seven Latin American countries, and section 5 contains brief conclusions. Two appendices are also included: the first discusses and presents the data used in the cost simulation tool, and the second provides a more complete report on the cost estimates for 2020 and projections for 2025.

1. Model for estimating the cost of long-term care systems

This section describes the model the tool uses to simulate the cost of long-term care systems. Under this model, the annual amount a country's government will need to spend on a long-term care system will depend on the number of service recipients multiplied by the annual cost of the services, plus the system's administrative costs. The number of beneficiaries is a function of the size of the care-dependent population and the eligibility criteria established by the government, adjusted by the desired coverage level. The cost of the services, in turn, are derived from the cost of each individual service the system offers (namely, services in residential care settings, services at day centers, personal home care, telecare, and respite services) multiplied by the number of recipients of each service, as shown in Figure 1. Costs are constructed using a bottom-up approach, meaning they are based on micro-elements like the number of recipients and the cost of services. This process is the same as the one used in González-González et al. (2019) to estimate costs for Mexico, and it was also used previously by Matus-López and Pedraza (2014) for Chile and by Matus-López (2017) for Uruguay.

Figure 1. Structure of the model for estimating the cost of a long-term care system



Source: Adapted from Cafagna et al. (2019).

The main contribution of the cost simulation tool is that it helps users quickly make their own estimates, and it is also flexible enough to allow users to adjust several variables, like the cost and intensity of services. The simulation tool's primary purpose is to allow users to generate cost scenarios for different service and coverage packages. This contrasts with previous efforts that have attempted to estimate the future costs of care systems based on current expenditure.

This note's model for estimating costs aligns with the literature on the costs of long-term care systems, although it does not include all elements covered by other models. In a review of 11 cost models,² Hamdy and Mazlynda (2017) assert that these models usually take four factors into account: 1) demand for services, as a function of the number of older people with disabilities and the amount of care they need; 2) the supply of long-term care services and their cost; 3) the country's total expenditure and the funding scheme, and 4) the distributional effects of long-term care policies. The model developed in this technical note includes the first two elements, but not the last two.

The bottom-up approach used in this technical note stands in contrast to the body of research that has focused on projecting the costs of existing systems, generally using a top-down approach in which future costs are estimated based on national account system variables. De la Maisonneuve and Oliveira Martins (2013, 2015), for example, use this approach to project the cost of care systems in OECD countries until 2060. They take current spending on long-term care and use variables to project future expenditure. These include demographic variables like life expectancy and healthcare expenditure, and non-demographic variables like income, the cost of disease, and women's labor force participation (as a determinant of the supply of informal care).

The bottom-up approach to projections used in this note is considered a better fit for countries that have no formal care systems, such as those with a few long-term care

² This review covers the model for projecting the cost of a long-term care system in the United Kingdom from the Personal Social Services Research Unit (Wittenberg, Hu, & Hancock, 2018) and the model used by the European Commission (2018), among others.

programs with limited coverage. In these cases, governments' current expenditure falls far short of countries' needs and is not a good basis for projecting future costs.

2. Who the system's recipients are and what services they receive: the difficult decision

The main purpose of this cost simulation tool is to assist decision-makers as they design long-term care systems, particularly in their decisions about the system's recipients and services. Users of the simulation tool make both of these decisions when they define the coverage level for each type of long-term care service.

At this point, the definition of care dependence is worth reiterating. As in other Inter-American Development Bank publications (for example, Cafagna et al., 2019), this note considers people to be care dependent when for an extended period of time they have difficulty performing activities of daily living and need help from others, as established by the WHO (2015a). These activities include basic activities of daily living (BADL), which are those necessary for living independently, like eating, showering or bathing, and using the toilet. Also relevant are the instrumental activities of daily living (IADL), which are related to cognitive aspects and social relationships. Examples include shopping, cooking, doing housework, managing money, and using the telephone (see [Appendix 1](#)).

As explained previously, the cost simulation tool quickly provides a picture of how changes in service packages and system beneficiaries impact the system's overall cost. It can be used to compare three packages of services and project future costs.

The rest of this section focuses on important technical considerations that should be taken into account when defining coverage and service packages, both in the cost simulation tool and in real life.

How to determine the most appropriate type of service for each person. The service needed is largely a function of their care-dependence status, although preferences and family and social context are also important factors. For example, residential care settings are generally a more appropriate option for people who are severely dependent on long-term care and also constantly need healthcare services and have limited family support. Telecare and care at day centers, on the other hand, are better suited for people who are mildly dependent on long-term care. Home care and respite services³ can be molded to meet people's care needs. Mildly or moderately care-dependent people need fewer hours of care and less specialized caregivers compared to severely care-dependent individuals.

³ "Respite services" are services designed to give the family members of care-dependent people a break. For the purposes of this technical note, they consist of personal assistance in the home.

This has ramifications for the cost of care: the most intense services—those best suited for more heavily care-dependent people—are more costly. For example, the cost structure suggested in the simulation tool puts the monthly cost of telecare at US\$35, compared to US\$1,750 for residential care.⁴

The work done by Oliveira Hashiguchi and Llena-Nozal (2020) could be of use in deciding how to adjust the coverage of each service and the intensity of personal care required based on level of care dependence. These authors present a detailed description of eight typical ways of meeting the care needs of people who are mildly, moderately, or severely care-dependent.⁵ For example, moderately care-dependent people would receive around 100 hours of personal care per month (22.5 hours per week), and this care could be given by a professional caregiver, an unpaid caregiver, or a combination of the two.

Table 1 describes each type of service included in the cost simulation tool and suggests the level of care dependence for which it is best suited.

Table 1. Description of types of services

Type of service	Description
Residential care setting	Services provided in facilities that include housing. Residential care settings offer a comprehensive package of services to help people perform basic and instrumental activities of daily living. They also provide more complex healthcare services in most cases. They are thus geared towards severely care-dependent people.
Personal home care	Services provided in a person's home. The backbone of this category of services are personal care assistants, who help older people perform basic and instrumental activities. It can also include housework help and food preparation services. These services can be offered to people who are severely, moderately, or mildly care-dependent.
Day center	Services offered at facilities that do not include housing. Day centers usually focus on preventive and recreational activities rather than helping people perform activities of daily living. They are thus often used in tandem with home care services. The target population for these services are mildly care-dependent or independent people.
Telecare	Remote services provided using information technology. Telecare services are designed to continuously monitor a person and provide an immediate response in an emergency. Examples are emergency hotlines; personal alarms; medication dispensers; motion sensors; panic buttons; fall detectors; and temperature, smoke, and water leak detectors. Since telecare services do not help people perform basic activities of daily living, they are usually considered a complement to home care services. They are generally meant for people who are moderately or mildly care-dependent and/or have chronic conditions.

⁴ This is discussed further on in Table 3 in Section 4.

⁵ The authors use these categories to compare how much long-term care would cost in different OECD countries.

Type of service	Description
Respite	Respite services are care services designed to give primary caregivers a break so they can rest and take care of their own needs. These services can be provided at people's homes, in residential care settings, and even at day centers. This simulation tool limits respite services to personal home care. Respite services fall into the category of services for caregivers, which are services designed to support those providing care without pay (usually family members). They aim to enhance the performance and lighten the workload of caregivers, who are often stressed and isolated, fail to attend to their own health, and have a hard time keeping up with their studies/work.

Source: Adapted from Cafagna et al. (2019)

Level of care dependence as the key criterion for eligibility. This is one of the public policy recommendations for designing a long-term care system made in Cafagna et al. (2019). Most countries with these systems use an instrument to identify and measure care dependence.⁶ Focusing support on the oldest group is a common practice that allows costs to be contained. It is also a way to prioritize care for particularly vulnerable groups, since older people, especially over age 80, are more likely to be dependent on long-term care. However, it is important to keep in mind that in low- and middle-income countries, population aging is coinciding with a high rate of chronic diseases that can make people care dependent at an earlier age (WHO 2015b; Nitrini et al., 2009; Prince et al., 2015). For example, the government of Uruguay has use care dependence level and age as criteria for prioritizing beneficiaries as they slowly roll out the National Care System. In that system, personal care services are for severely care-dependent people under age 30 and people over age 80. Meanwhile, day center services focus on mildly or moderately care-dependent people over age 65, while telecare is for people over 70 who are also mildly or moderately care dependent.

Care-dependent people usually receive more than one type of service. Some long-term care systems create a plan that includes various services according to the needs and preferences of care-dependent people and their family members. The simulation tool is flexible and allows for the possibility of people receiving more than one service, although the example application used in this technical note assumes that people only receive one type of service. If simulation tool users need to modify this assumption and model costs based on people receiving more than one service, they should bear in mind that the aggregate coverage indicators, that is, “coverage by level of care dependence” and “total coverage” show the number of services offered⁷ divided by the number of potential recipients. This means that if care-dependent people receive more than one

⁶ See Medellín et al. (2018) for a description of the instruments used to measure care dependence. Appendix 1 of this technical note contains the data on long-term care used in the simulation tool.

⁷ The number of services offered is obtained by multiplying the coverage for each service by the number of potential recipients in the system. It is calculated by level of care dependence and total coverage.

service, the coverage indicator could exceed 100%, but this would not necessarily mean that everyone will receive services.

To illustrate this, imagine the simulation tool user designed a service package where everyone who receives care at day centers also receives telecare services. If this service package covers 50% of mildly or moderately care-dependent people, the coverage indicator reported by the simulation tool will be 100% for people with that level of care dependence, even though only half of them receive services.

Use partial coverage to implement criteria that target or prioritize recipients based on income level.⁸ The current structure of the simulation tool does not allow users to target services based on the income level of care-dependent people. However, they could use partial coverage and assume that benefits are focused on lower income people.

The costs of long-term care services are quite burdensome, even in developed countries and for people not living in poverty (Oliveira Hashiguchi & Llana-Nozal, 2020). For this reason, a means-tested approach is not recommended (Cafagna et al., 2019). However, some countries use the income level or wealth of people or of their families as a criterion for determining whether they qualify for the system's benefits or whether they should be given priority. In the United States, only low-income people qualify for the long-term care services provided through Medicare. There are also other countries where means can limit access to the system's benefits. This is the case in Spain, where lower income people are given priority access.⁹

One factor to keep in mind is that care dependence rates may vary between income groups. The data from Costa Rica, Argentina, and Chile analyzed to implement the cost simulation tool suggests that different income groups have different levels of care dependence. In Costa Rica, a higher percentage of low-income people are dependent on long-term care. However, this pattern does not hold true in Argentina and Chile, where the middle quintiles have the highest care dependence rate.

Use a limited supply of hours of care or partial coverage to reflect that families will continue to cover part of the services. The cost simulation tool does not suggest a predetermined level of unpaid care provided by families. In other words, it assumes that all care-dependent people would potentially require the system's services. This allows simulation tool users to design packages that cover all care needs or only certain ones using the parameters of coverage and number of hours of personal home care and respite services. There are two reasons why the system may not provide full coverage.

⁸ This refers only to access to the system's benefits, not to the level of benefits received. Most long-term care systems offer greater benefits to lower income people. In other words, people with more income should contribute a higher percentage of the cost of the services. Step 5 of the "control panel" sheet of the simulation tool in the Excel file, on copayments, allows users to model that policy decision.

⁹ See the Law on Personal Autonomy and Long-Term Care: <https://www.boe.es/buscar/pdf/2006/BOE-A-2006-21990-consolidado.pdf>

First, some people prefer to be cared for by their families, and second, the system's benefits may only partially cover care needs.

Other cost estimation models recognize that a percentage of people will prefer to be cared for by their families and that this will be a viable option, meaning they will not seek support from the system. For the case of England, Wittenberg, Hu, and Hancock (2018) project demand for formal long-term care services and assume a constant percentage of people who receive unpaid care from their families across age groups (and other variables). Likewise, Matus-López (2017) projects two scenarios for Uruguay: one in which most people continue to receive unpaid care, and another in which the large majority receive care from the system. Meanwhile, Oliveira Hashiguchi and Llena-Nozal (2020) propose scenarios where care is partially or completely provided by families, not necessarily as a matter of preference but rather to lower costs.

3. How the cost simulation tool for long-term care systems works

This section explains how to use the tool for simulating the cost of long-term care systems. The materials related to the cost simulation tool including an instructional video, the cost simulation tool and this technical note are available for download at <https://www.iadb.org/en/panorama/cost-simulation-tool>.

Before reading, users are recommended to download the cost simulation tool, unzip the folder and open the Excel file. The user must go to the “control panel” tab of the spreadsheet, which has the five steps described below for estimating the costs of long-term care systems:

Step 1. Identify the demand for long-term care services in 2020

Step 2. Adjust the cost of the services

Step 3. Determine the coverage of each service

Step 4. Estimate future cost scenarios

Step 5. Calculate how much could be collected through a copayment scheme.

In addition to the “control panel,” the Excel file has other tabs that show specific results. For example, the “comparisons” tab shows how the cost of long-term care systems compares to other public programs. The tabs “future constant rate” and “future changing rate” allow users to adjust projections. The “control panel” sheet also includes links for navigating to the other tabs, though users can also click on them directly. The “macro data” tab contains reference information on gross domestic product (GDP) and exchange rates, while “sources” contains the household surveys used to estimate care dependence levels.

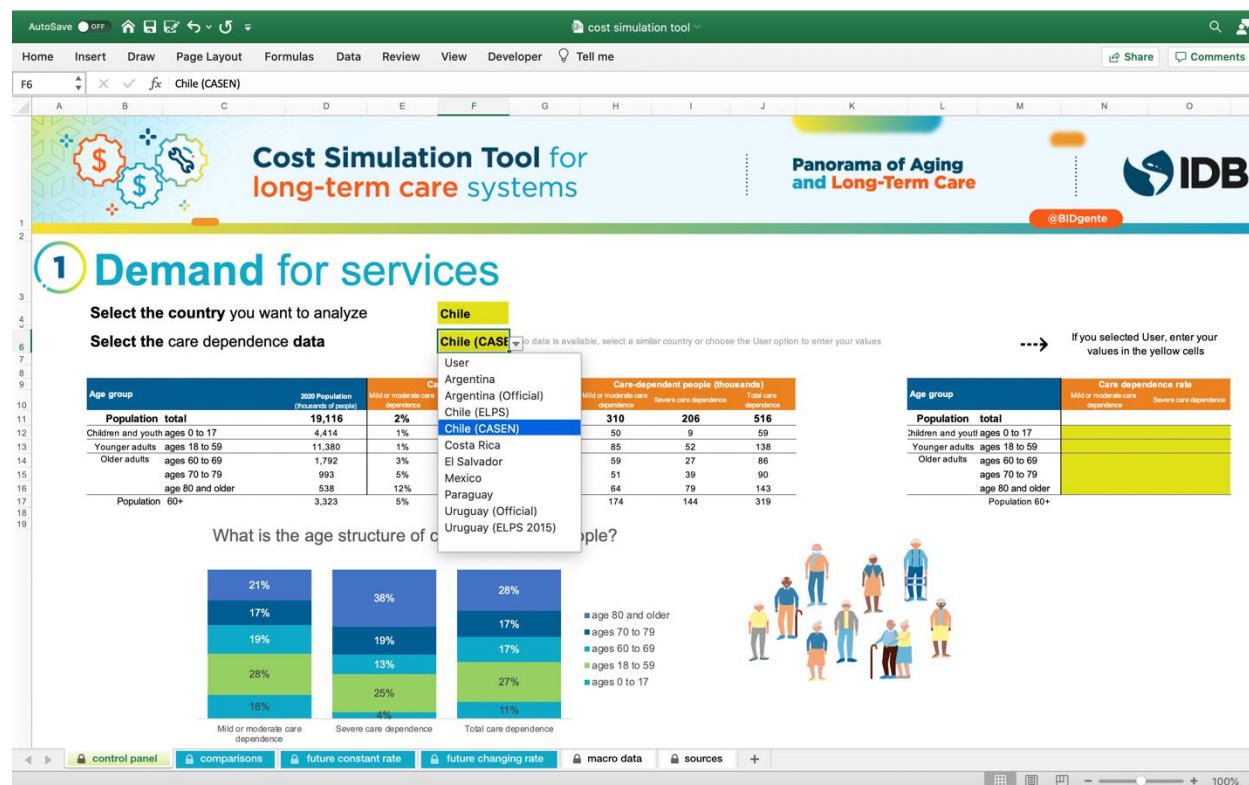
As a general rule, yellow cells can be modified by users.

The rest of this section gives a general description of each of the five steps, applying the tool to Chile. The closing subsection, [Simulation tool extensions](#), explains how the tool can be adjusted for specific cases. Then, section 4 of this document applies the general configuration for Chile to seven countries in Latin America.

Step 1. Identify the demand for long-term care services in 2020

To estimate demand for long-term care services, meaning the system's potential number of beneficiaries or recipients, users must first select the country they wish to analyze and the care dependence data source. If no data is available for the country in question, they can assign external values. This is explained in the [Simulation tool extensions](#) subsection. As shown in Figure 2, the country is selected in cell F4 and the data on care dependence in cell F6. For some countries, including Chile, there is more than one option for care dependence data. This example uses data from the *Encuesta de Caracterización Socioeconómica Nacional* (CASEN), so the option “Chile (CASEN)” is selected.¹⁰

Figure 2. Demand for services



Source: Screenshot of the cost simulation tool.

¹⁰ The “sources” tab of the Excel spreadsheet contains a complete list of the care dependence estimates available in the simulation tool, as well as descriptions of these estimates. This information can also be found in Table A1.1. Description of the surveys used to measure care dependence.

Step 2. Adjust the cost of the services

In this step, users have the option to modify the monthly costs of long-term care services, as well as the system's administrative costs. For personal home care services and respite services, users need to change the number of hours per month and the hourly wage for caregivers, since the monthly cost depends on these variables. The administrative cost is expressed as a percentage of the total cost of the system's services and should include the costs of identifying recipients and providing the benefits, as well as of quality monitoring and assurance. Administrative costs are set to 5% by default. Users can adjust this percentage by entering a different value in cell H25 of Figure 3.

For Chile, the number of hours of personal home care per month increases from 80 (the number suggested by the simulation tool) to 100 (see cell I35 in Figure 3). When adjusting costs, it is important that they reflect a realistic scenario that permits quality services and jobs.

Figure 3. Cost of the services

2: Cost of the services

Enter the system's administrative cost as a percentage of its total cost:
(Include the costs of quality monitoring and assurance)

5%

Adjust the cost of the services

a. Review the hourly wages of caregivers

Caregiver with basic qualifications	\$5.0	per hour
Caregiver with specialist qualifications	\$7.5	per hour

b. Define the number of hours per month of personal care and respite services

Type of service	Hours per month	
	Mild care dependence	Severe care dependence
Personal home care	40	80
Respite services	10	20

c. Adjust the monthly costs of the services (in US\$)

Type of service	Monthly cost of service	
	Mild care dependence	Severe care dependence
Residential care settings	\$800	\$1,750
Personal home care	\$200	\$600
Day centers	\$200	\$583
Telecare	\$35	\$70
Respite services	\$50	\$150

← these values depend on the number of hours of service per month

control panel | comparisons | future constant rate | future changing rate | macro data | sources

Source: Screenshot of the cost simulation tool.

Step 3. Determine the coverage for each service

In this step, users design the service packages that a long-term care system could offer. They set the coverage level for each type of long-term care service according to the beneficiary population's level of care dependence. In other words, this step is for defining who can receive services and what type of services the system's potential beneficiaries can receive.

Figure 4. Beneficiaries of the long-term care system

3 Long-term care system users

Determine the eligible age groups
Enter 1 for eligible age groups and 0 for groups that do not qualify for the system's benefits

		Level of care dependence	
		Mild and moderate	Severe
Children and youth	ages 0 to 17	0	0
Younger adults	ages 18 to 59	0	0
Older adults	ages 60 to 69	1	1
	ages 70 to 79	1	1
	age 80 and older	1	1

Create two packages of services by selecting the coverage for each service and population group

	Example		Services 1		Services 2	
	Care dependence: mild and moderate	severe	Care dependence: mild and moderate	severe	Care dependence: mild and moderate	severe
Residential care settings		40%				
Personal home care	40%	50%				
Day centers	20%					
Telecare	30%					
Respite	10%	10%				
Coverage by level of care dependence	100%	100%	0%	0%	0%	0%
Total coverage	100%		0%		0%	

A coverage level of over 100% is the result of users receiving more than one service

Source: Screenshot of the cost simulation tool.

In the first table in Figure 4, users specify whether a given age group and care-dependence level will receive services. A 1 in this table means a group will receive services, and a 0 means they will not. The default option is for all age groups to receive services, provided information is available for those groups.¹¹ In the case of Chile, the CASEN survey has information on all age groups,¹² but this example will focus exclusively

¹¹ The age groups available for each country can be found in the "sources" tab of the Excel file, and in Appendix 1 to this note.

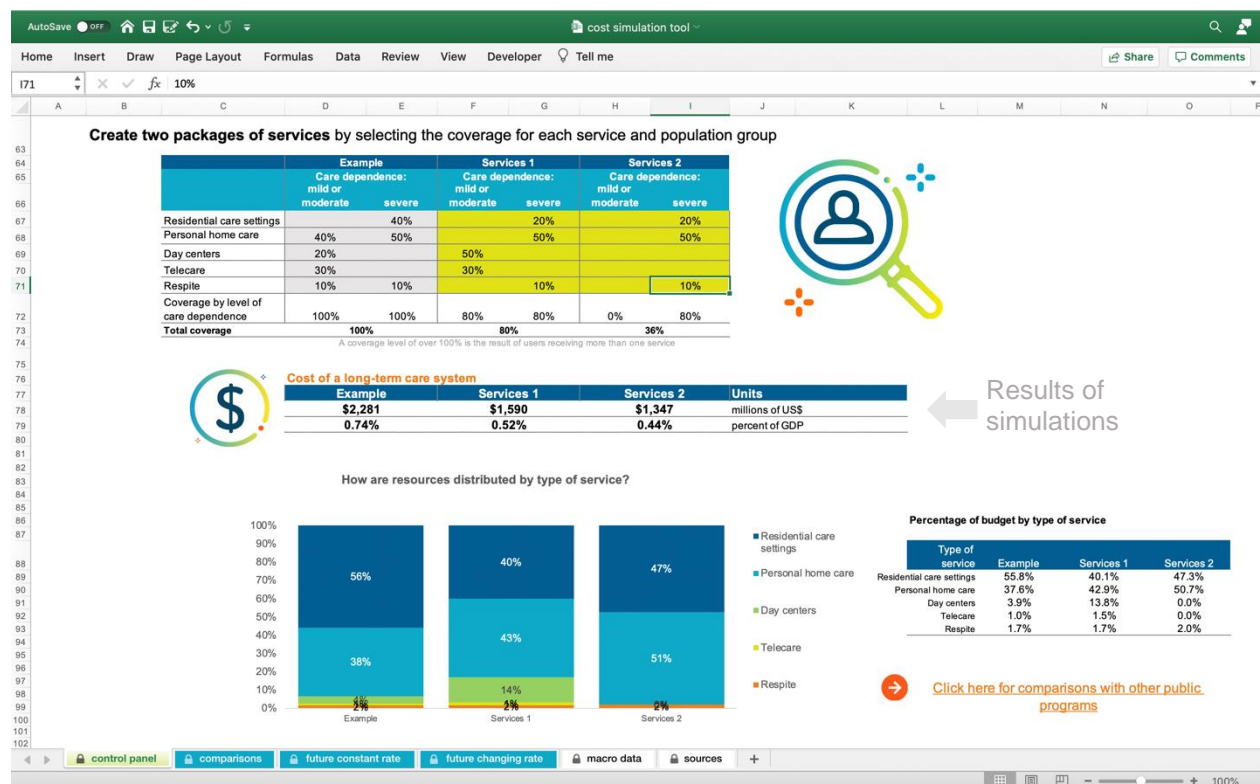
¹² As explained in Section 4, the care-dependence rate for children under age 6 is assumed to be the same as the one for children ages 6 to 17.

on people over age 60.¹³ Therefore, a zero is entered for the 0 to 17 age group and the 18 to 59 age group for both levels of care dependence (see rows 57 and 58 in Figure 4, marked with a gray arrow).

The second table in Figure 4 on this sheet is the core of the simulation tool. Here the user can assemble up to two packages of services that a long-term care system could offer and enter them in the yellow cells marked “Services 1” and “Services 2” (rows 67-71).

The gray cells contain an “Example” package that covers all care-dependent people (here it is assumed that everyone receives just one type of service). In the case of mildly or moderately care-dependent people, 40% receive personal home care, 20% receive care at day centers, 30% receive telecare services, and 10% receive respite services. For severely care-dependent people, 40% receive services in a residential care setting, 50% receive personal home care, and 10% receive respite services.

Figure 5. Results of estimating the cost estimates for the service packages



Source: Screenshot of the cost simulation tool.

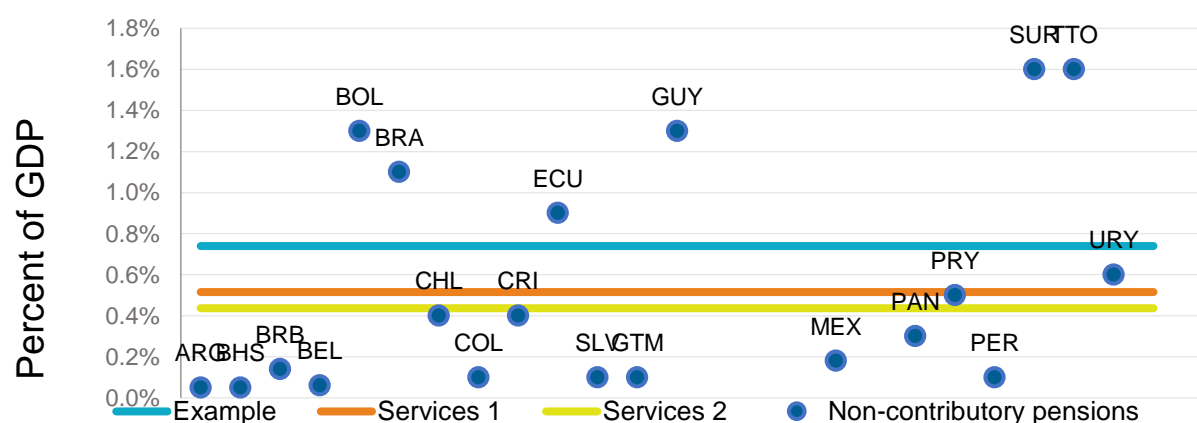
¹³ Here the age of people who can receive benefits is limited to make it easier to apply the same example to the other six countries and present the results of this analysis in Section 4.

The yellow cells in Figure 5 contain the design of two service packages with partial coverage.¹⁴ The results of applying these two packages and the example package to Chile are shown in the results table marked with the “\$” sign. For Chile, the packages cost between US\$1.347 billion (0.44% of GDP) for the “Services 2” package and US\$2.281 billion (0.74% of GDP) for the example package. The bar graph at the bottom of Figure 5 shows how resources are distributed by type of service. In the example package, nearly 56% of resources are allocated to services in residential care settings, while only 40% of the budget goes to this item in the “Services 1” package.

The simulation tool expresses results in United States dollars (US\$) and as a percentage of GDP. If users want to do their own calculations to convert the values into local currency, they can consult the exchange rate used in the “macro data” spreadsheet in the Excel file.

This simulation tool lets users compare the estimated costs of a long-term care system to the amount spent by governments in Latin America and the Caribbean on other social programs or assistance—including noncontributory pension programs, public expenditure on health, and fuel subsidies—as a percentage of gross domestic product. To see these comparisons in graphic form, click on the orange link at the bottom right of Figure 5 (cell L98). Figure 6 shows comparisons using the packages created for Chile.

Figure 6. Comparison between the cost of a long-term care system and public spending on non-contributory pensions in 2018



Source: Economic Commission for Latin America and the Caribbean (2020).

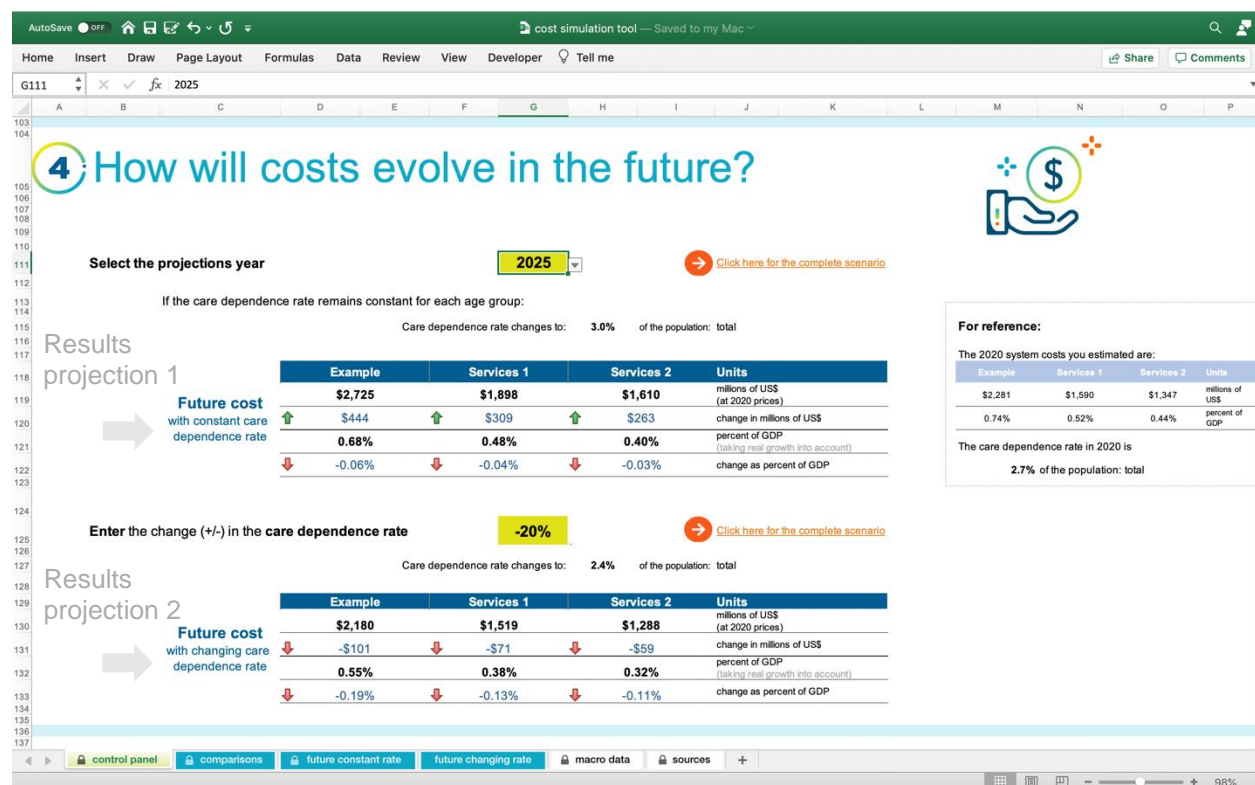
¹⁴ Details on these service packages are provided in Section 4, which applies this general case to seven Latin American countries (see Table 3).

Step 4. Estimate future cost scenarios

The fourth step of the cost simulation tool allows users to make estimates for a few future scenarios. The first scenario provides an estimate of how the cost of a long-term care system will change in the future as a result of population aging. The second projects how future costs would change if, in addition to the predicted aging, the care dependence rate goes up or down. The cost of the services is assumed to remain constant over time for both projections. However, this pair of assumptions can be modified, as described in the section [Simulation tool extensions](#).

To make the projections, select the year for the projection in the first yellow cell (cell G111 in Figure 7). The options are 2025 and 2030. To calculate the second projection, which takes into account changes in the care dependence rate, enter the percent change in the future care dependence rate in the second yellow cell (cell G125 in Figure 7).

Figure 7. What will happen to the cost of the system in the future?



Source: Screenshot of the cost simulation tool.

Figure 7 also displays the results of the 2025 projections for the packages created for Chile. The cost of the long-term care packages would increase by between US\$263 million (for the “Services 2” package) and US\$444 million (for the example package).¹⁵ The results are shown in the table labeled “Future cost with constant care dependence rate” and are marked with a gray arrow.

In a second scenario, for example assuming that a public policy for healthy aging manages to lower the care dependence rate by 20% (as shown in cell G125), the costs of the long-term care system could decrease. This result is shown in the second panel of results (in the table “Future cost with changing care dependence rate”) and are marked with a gray arrow. Details on the calculations for future scenarios—for example, those estimating the future care-dependent population—can be found in the “future constant rate” and “future changing rate” tabs.

Step 5. Calculate how much could be collected through a copayment scheme

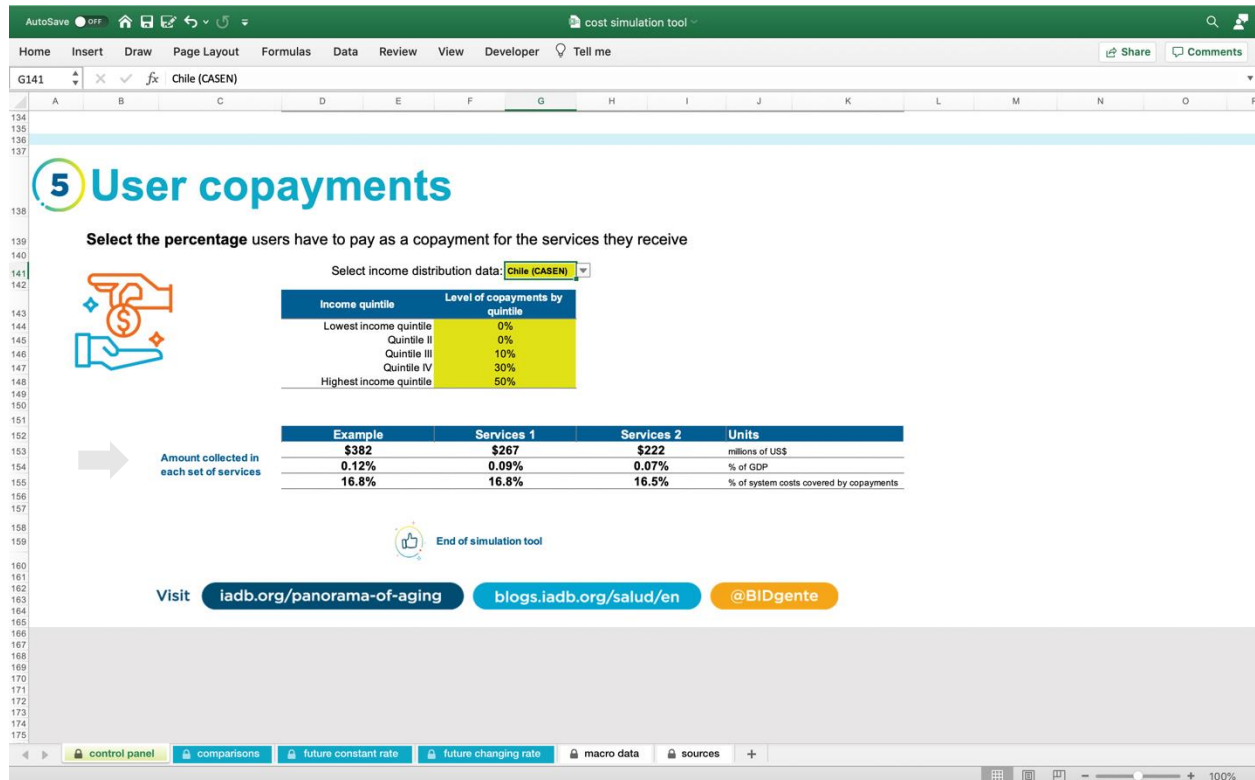
Step five of the cost simulation tool is for calculating how much money can be collected from system users’ out-of-pocket spending by implementing a copayment scheme. The data needed for this step is only available for a few countries.¹⁶ The simulation tool suggests a scheme where the bottom 40% of the population in terms of income have no copayment for services.

The copayment percentage gradually increases from 10%, paid by people in the third quintile, to 50%, paid by those in the highest quintile. The percentage that each group of beneficiaries has to pay according to their income level can be changed by entering different values in the yellow cells (see Figure 8, rows 144 to 148). For the packages designed for Chile, a copayment scheme like the one shown in Figure 8 could collect around 17% of the total cost of the care system for the three packages of services (see the table at the bottom of Figure 8).

¹⁵ At the time of publication of this note, there was great uncertainty regarding the magnitude of the economic consequences of the COVID-19 pandemic. The statistics for gross domestic product (GDP) are the International Monetary Fund estimates in the *World Economic Outlook* (October 2019 version) and are included for reference purposes only. Further on, the [Simulation tool extensions](#) section explains how users can adjust GDP projections and enter external values.

¹⁶ In the future, data from other countries could be included whenever statistics on income or a proxy for income can be processed.

Figure 8. Copayments of system beneficiaries



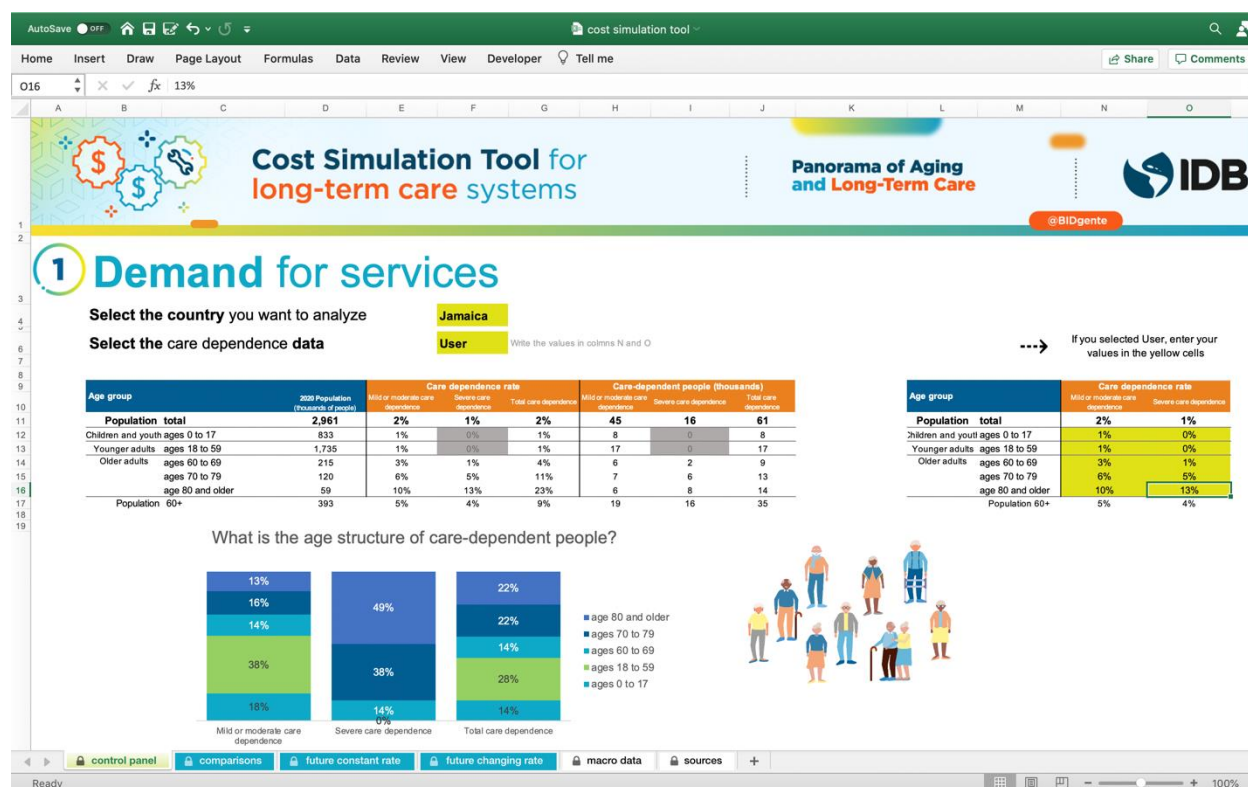
Source: Screenshot of the cost simulation tool.

Simulation tool extensions

Having shown how the simulation tool applies to the general case of Chile, this section offers some strategies for making the tool even more flexible using **extensions**. In particular, it explains how to use external data on care dependence levels, and how to adjust the costs of services and the countries' GDP reference values.

Extension 1. How to use external data for care dependence levels. If the cost simulation tool does not have information for the country to be analyzed, or if users prefer to use external estimates for care dependence levels, they can select the “user projections” option in cell F6 and add care dependence estimates in the cells highlighted yellow in columns N and O of Figure 9. These cells contain an example with hypothetical data on care dependence in Jamaica.

Figure 9. Using external data on care dependence levels in 2020 in the cost simulation tool



Source: Screenshot of the cost simulation tool.

Extension 2. How to modify the costs of services in future projections. The general case applied to Chile assumes that the costs of services will remain constant over time. However, these costs can be modified for future scenarios to reflect service price increases. To change the costs, go to the “future constant rate” tab and modify the cells with yellow highlighting in step 2, “Cost of the services.” For example, in cell H30 of Figure 10, the hourly wage of caregivers with specialized training is changed from US\$7.5 to US\$10. Any changes entered in these cells will automatically modify the costs of the future scenario with a changing care dependence rate. The results of the projections are summarized in “control panel” in step 4 on future costs scenarios.

Figure 10. Changing the future cost of the services

2 Cost of the services 2025

Enter the system's administrative cost as a percentage of its total cost:
(include the costs of quality monitoring and assurance) **5%**

Adjust the cost of the services

a. Review the hourly wages of caregivers

Caregiver with basic qualifications	\$5.0	per hour
Caregiver with specialist qualifications	\$10.0	per hour

b. Define the number of hours per month of personal care and respite services

Type of service	Hours per month	
	Mild care dependence	Severe care dependence
Personal home care	40	100
Respite services	10	20

c. Adjust the monthly costs of the services (in US\$)

Type of service	Monthly cost of service	
	Mild care dependence	Severe care dependence
Residential care settings	\$800	\$1,750
Personal home care	\$200	\$1,000
Day centers	\$200	\$583
Telecare	\$35	\$70
Respite services	\$50	\$200

← these values depend on the number of hours of service per month

← these values depend on the number of hours of service per month

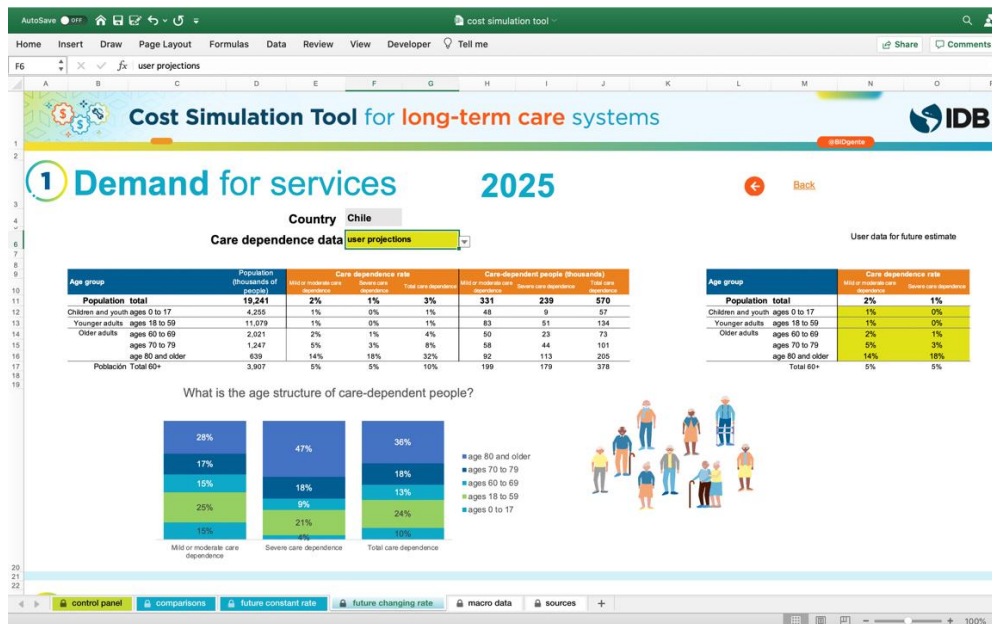
control panel | comparisons | future constant rate | **future changing rate** | macro data | sources

Source: Screenshot of the cost simulation tool.

Extension 3. How to change the care dependence rate for future projections in a way that is differentiated by age and care dependence level. It is also possible to modify the assumption that the care dependence rate will change proportionally for all age groups in the future. To use external data on care dependence levels in future scenarios, go to the “future changing rate” sheet (see Figure 11). Select the “user projections” option in cell F6¹⁷ and enter the values in cells N and O, which are highlighted yellow. These changes will only affect the projection with a changing care dependence rate. The results of the projections are shown in the “control panel” tab.

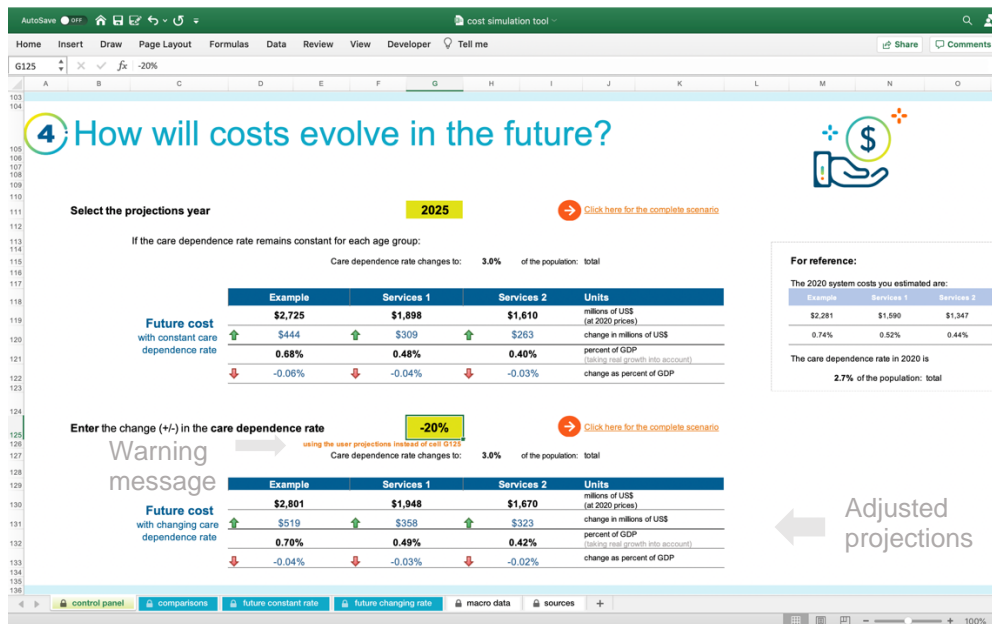
¹⁷ When the “user projection” option is selected in cell F6 of the “future changing rate” tab, the data on future care dependence rates used to estimate costs is no longer taken from the change in care dependence rate entered in cell G125 in the “control panel” tab. To return to this scenario with a proportional increase in the care dependence rate for all age groups and levels of care dependence, select the “2020 baseline projections” option in cell F6 of the “future changing rate” tab.

Figure 11. Changing care dependence rate projections



Source: Screenshot of the cost simulation tool.

Figure 12. Changing care dependence rate projections



Source: Screenshot of the cost simulation tool.

In the example shown in Figure 11, a hypothetical projection where the care dependence rate in Chile changes to a different degree for each age group is entered manually using the “user projections” option. In this example, the rate drops by 25% for people aged

60 to 69 and by 10% for people ages 70 to 79. Meanwhile, care dependence increases by 20% for people over age 80.¹⁸ Figure 12 displays the adjusted results of the projection with changing rates in the “control panel” tab.¹⁹ The cost of the three service packages is higher than in the general example in Figure 7, where the care dependence rate falls by 20% for all age groups (see Figure 7). For example, the cost of the Services 2 package increases from US\$1.288 billion to US\$1.670 billion.

Extension 4. How to adjust GDP projections. Users can enter GDP projections that are different from those included in the cost simulation tool. This is especially relevant given that the International Monetary Fund projections used in the simulation tool are from before the economic crisis caused by COVID-19. To make the changes, adjust the values in the columns highlighted in yellow in the “macro data” tab (Figure 13).

Figure 13. Changing GDP projections

Country	num	code	Year	GDP millions of US\$	exchange rate
Argentina	213	ARG	2020	443,249	72.924
Argentina	213	ARG	2025	592,893	146.376
Argentina	213	ARG	2030	663,940	146.376
Bahamas	313	BHS	2020	12,815	1.000
Bahamas	313	BHS	2025	14,848	1.000
Bahamas	313	BHS	2030	15,236	1.000
Barbados	316	BRB	2020	5,322	2.000
Barbados	316	BRB	2025	6,263	2.000
Barbados	316	BRB	2030	6,291	2.000
Belize	339	BLZ	2020	2,076	2.000
Belize	339	BLZ	2025	2,409	2.000
Belize	339	BLZ	2030	2,681	2.000
Bolivia	218	BOL	2020	45,253	6.860
Bolivia	218	BOL	2025	65,054	6.860
Bolivia	218	BOL	2030	83,040	6.860
Brazil	223	BRA	2020	1,893,010	4.041
Brazil	223	BRA	2025	2,328,071	4.300
Brazil	223	BRA	2030	2,495,110	4.300
Chile	228	CHL	2020	308,505	685.567
Chile	228	CHL	2025	398,759	704.610

Source: Screenshot of the cost simulation tool.

¹⁸ The values for this hypothetical projection are found by multiplying the estimated care dependence rate values listed on the “future constant rate” tab (cells E12:F16) by the percent change in each age group. To help users replicate the exercise, the values of the hypothetical projection are included in the yellow cells on the “future changing rate” sheet (cells N12:O16).

¹⁹ When the “user projections” option is used, the simulation tool shows a message warning that the user’s values are being used instead of the change in care dependence rate in cell G125 of the “control panel” sheet (see Figure 12). To deactivate the user’s projection, the “2020 baseline projections” in cell F6 on the sheet “future changing rate” has to be selected.

4. Application: Simulating the cost of a long-term care system in seven countries

In this section, a specific configuration of the cost simulation tool is applied to seven Latin American countries that have care dependence data: Argentina, Chile, Costa Rica, El Salvador, Mexico, Paraguay, and Uruguay. The parameters used are the same as the ones in the example application for Chile in [Section 3](#) of this document.

The potential beneficiaries of a system focused on older people make up a very small percentage of the population. In Chile, Costa Rica, Mexico, and Uruguay, they represent about 2% of the countries' population, and even less in the other countries analyzed (Table 2).²⁰ The number of potential beneficiaries depends on the size of the country's population, the care dependence rate of older people, and the extent of population aging. The care dependence rate of older people varies widely between the seven countries:²¹ it stands at 19% in Mexico and 4% in El Salvador and Paraguay (Figure 14).²² There is also a significant difference between the countries' degree of aging. For example, older people make up 20% of Uruguay's population, while only constituting 10% of the population in Paraguay.

Table 2. Care-dependent people over age 60

	People by level of care dependence			Population	
	Mild or moderate	Severe	Total	Total population	% of population in the system
Argentina	209,991	189,563	399,554	45,195,776	0.9%
Chile	174,425	144,437	318,862	19,116,209	1.7%
Costa Rica	88,627	22,110	110,737	5,094,114	2.2%
El Salvador	19,904	12,187	32,091	6,486,201	0.5%
Mexico	1,991,835	730,447	2,722,282	128,932,751	2.1%
Paraguay	15,032	13,161	28,192	7,132,530	0.4%
Uruguay	52,096	20,188	72,284	3,473,727	2.1%

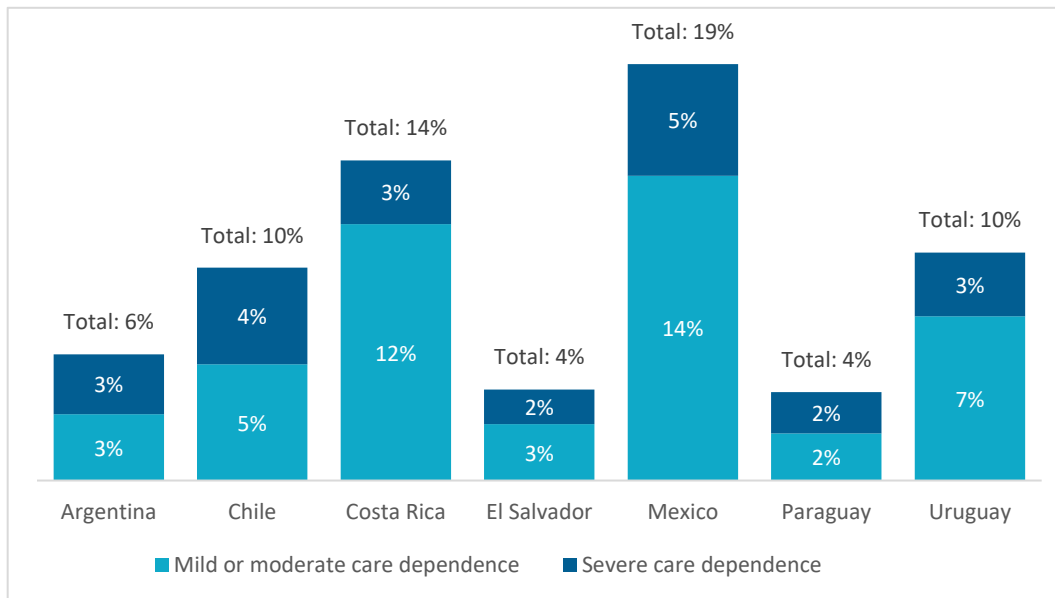
Source: Prepared by the author based on data from the Panorama of Aging and Long-Term Care and case studies.

²⁰ The care dependence data presented here could differ from the data reported in the case studies. This note uses United Nations population projections, while the case studies use the countries' own projections. Additionally, the projections in the case studies for Argentina and Uruguay use the official definitions of care dependence instead of the comparable ones.

²¹ For countries with more than one estimate, the one most compatible with the others is used. For Argentina, the "Argentina" measurement of care dependence is used. For Chile, the "Chile (CASEN)" was chosen, and "Uruguay (ELPS 2015)" was used for Uruguay.

²² Much of these differences could be attributable to methodological variations. See the section "Dependence on long-term care" in Appendix 1.

Figure 14. Care dependence rate in people over age 60, by country



Source: Prepared by the author based on data from the Panorama of Aging and Long-Term Care and case studies.

Note: The sum of the bars may not match the total due to rounding.

The two service packages used to estimate the costs of systems in the countries in the region are shown in the yellow cells of Table 3, which also contains the example package. The two packages designed in order to apply the tool to the countries offer partial coverage and follow the recommendations of Cafagna et al. (2019), which are summarized in this [video](#).

More specifically, Services 1 and Services 2 prioritize care for severely care-dependent people. In the package Services 1, most of the budget (85%) is allocated to services for severely care-dependent people, although 80% of mildly or moderately care-dependent people also receive some support. In the package Services 2, only severely care-dependent people receive support.

On the other hand, the packages Services 1 and Services 2 only provide care in residential care settings for a limited number of severely care-dependent people. Personal home care is given priority as a solution to the needs of those severely dependent on long-term care; 50% receive this type of care, and an additional 10% receive in-home respite services. Mildly or moderately-care dependent people receive services at day centers or via telecare.

Table 3. Service packages used in the simulation tool configuration applied to seven countries

	Example		Services 1		Services 2	
	Care dependence		Care dependence		Care dependence	
	mild or moderate	severe	mild or moderate	severe	mild or moderate	severe
Residential care setting		40%		20%		20%
Personal home care	40%	50%		50%		50%
Day centers	20%		50%			
Telecare	30%		30%			
Respite	10%	10%		10%		10%
Coverage by level of care dependence	100%	100%	80%	80%	0%	80%
Total coverage	100%		80%		36%	

Source: Prepared by the author.

The simulation tool estimates that implementing those packages in seven Latin American countries would cost between 0.3% and 1.0% of each country's GDP.²³ This is less expensive than the long-term care systems of countries outside of the region. For the sake of comparison, expenditure in OECD countries ranges from 0.2% (in Estonia and Hungary) to 3.7% in the Netherlands. The average for these countries is 1.7% of GDP (Cafagna et al., 2019: 35).

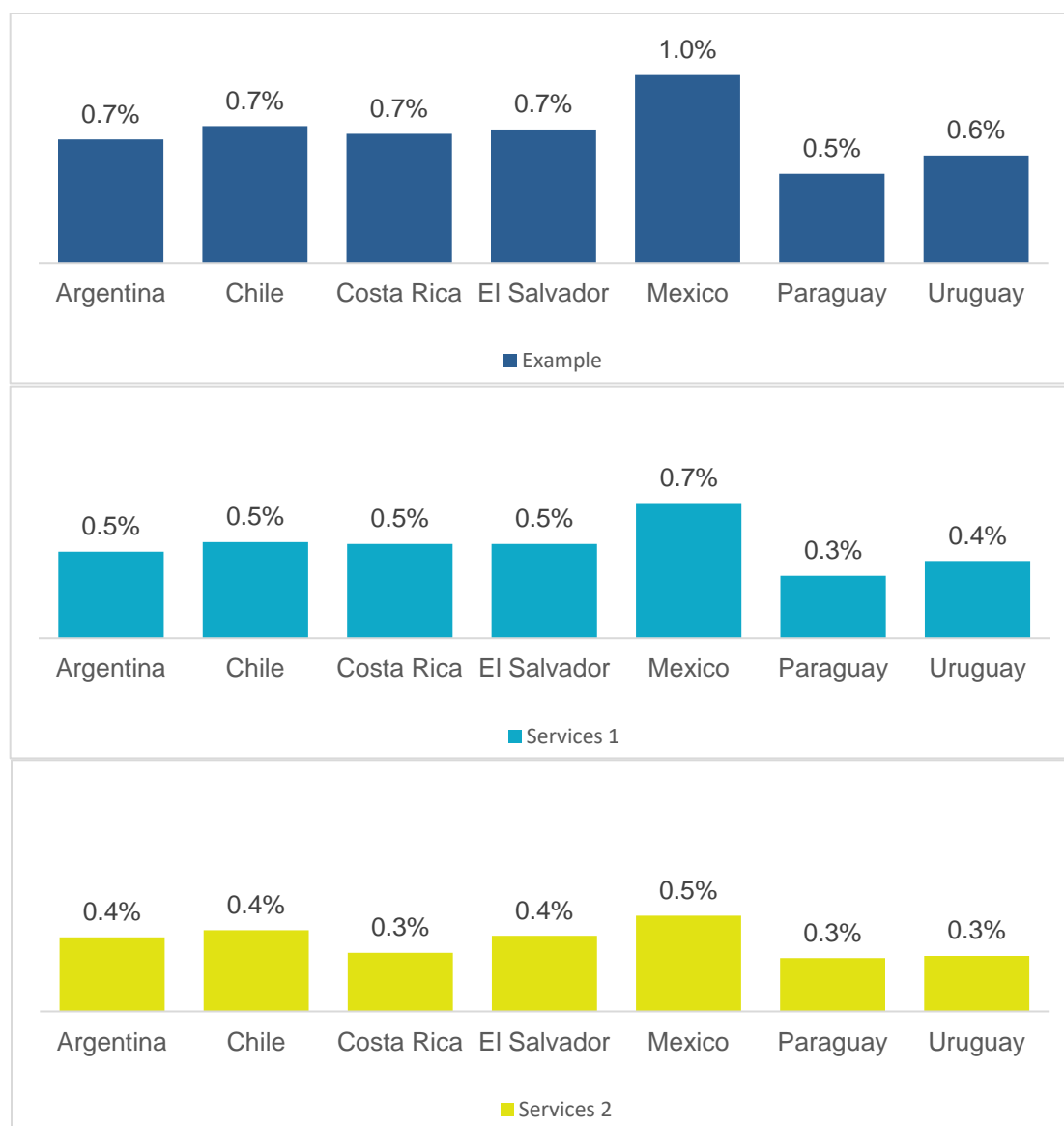
As shown in Figure 15, the example package is the most expensive for the seven Latin American countries analyzed, at 0.5% of GDP in Paraguay to up to 1% in Mexico. The package Services 2 is the least expensive, ranging from 0.3% of GDP for Paraguay, Uruguay, and Costa Rica to 0.5% for Mexico. Taking population size into account, the cost of the most generous package ranges from US\$29 per resident in Paraguay to US\$119 in Chile. The Services 2 package would cost between US\$17 (Paraguay) and US\$70 (Chile).

These results show that demand for services is more pronounced in countries with an older population. It is important to remember that differences in care dependence rates can be partially attributed to variations in methods for measuring that rate. Even so, it is noteworthy that systems cost considerably more in countries with an older population,

²³ The International Monetary Fund estimates that the GDP of Latin America and the Caribbean could fall by 5.6% to 7.5% in 2020 (<https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020>). The baseline data used is the projections published in the *World Economic Outlook* (WEO) in October 2019. At the time of writing, the WEO only offered projections until 2021. Though out of date, these projections help put the relative size of a long-term care system into perspective.

such as Chile, where 17% of the population is over age 60, and Uruguay, where the same group makes up 20% of the population.

Figure 15. Comparative cost of the systems applying the simulation tool example configuration



Source: Prepared by the author.

Table 4 complements the analysis by showing the results of future estimates. The scenario with a constant care dependence rate shows an increase in costs for all countries. A 20% drop in the care dependence rate is enough to lower the costs of the

care systems in all countries, with the exception of Costa Rica, where costs remain virtually the same and even increase for the Services 2 package. The complete results of the projections can be consulted in Appendix 2.

Table 4. Simulating the cost of a long-term care system in 2020 for seven Latin American countries

	Millions of US\$			US\$ per inhabitant		
	Example	Services 1	Services 2	Example	Services 1	Services 2
Argentina	2,962	2,060	1,767	66	46	39
Chile	2,281	1,590	1,347	119	83	70
Costa Rica	455	330	206	89	65	40
El Salvador	201	141	114	31	22	18
Mexico	13,433	9,584	6,811	104	74	53
Paraguay	206	144	123	29	20	17
Uruguay	366	261	188	105	75	54

Source: Prepared by the author.

Table 5. Estimations of resources collected through a copayment scheme in three countries in Latin America

	Millions of USD			Percent of GDP			Percent of total cost of system		
	Example	Services 1	Services 2	Example	Services 1	Services 2	Example	Services 1	Services 2
Argentina	536	371	326	0.12%	0.08%	0.07%	18.09%	18.02%	18.45%
Chile	382	267	222	0.12%	0.09%	0.07%	16.76%	16.81%	16.52%
Costa Rica	47	35	19	0.07%	0.05%	0.03%	10.43%	10.56%	9.41%

Source: Prepared by the author.

A progressive copayment scheme under which the 40% of the population that earns the least pays nothing could cover 10% of the system's cost in Costa Rica and nearly 18% in Argentina.

5. Conclusion

This technical note explains what the cost simulation tool is and how it can be used to estimate how much it would cost to implement long-term care systems in Latin America and the Caribbean.

The simulation tool's cost model is in line with the research on costs and projected costs of long-term care systems, although it does not include certain elements like countries' expenditure, the funding scheme, and the distributional effects of care policies. However, as a bottom-up model for estimating costs, it is more appropriate than a top-down approach because there are no formal long-term care systems in the region (with the exception of Uruguay).

The results of applying the model to seven countries show that the potential beneficiaries of the long-term care systems for older adults are a small percentage of the different countries' populations: around 2% for countries with higher care dependence rates and more advanced population aging. The cost of a long-term care system focused on older people (age 60 or over) could range from 0.5% to 1.0% of GDP for a generous package of services and universal coverage. The cost could drop to between 0.3% and 0.5% of GDP for a package of services covering 80% of severely care-dependent older people (Services 2). These figures are significantly lower than the expenditure of OECD countries, which on average is 1.7% of GDP (Cafagna et al., 2019: 35). Estimates show that aging will drive up the future costs of long-term care systems, and that only a considerable drop in care dependence rate (20% was used in this case) could lower (or contain, in the case of Costa Rica) the systems' costs.

In order to improve the accuracy of the simulations of the costs of long-term care systems in the region, we suggest the following lines of action:

- 1) Make efforts to standardize the way care dependence is measured in the region. One key step is to develop and apply a brief set of questions for assessing care dependence in household surveys and censuses. This would allow the inclusion of a short question in more than one survey per country—and even in population censuses—to ensure that care-dependent people living in residential care settings are taken into account, providing a better overview of the national and regional situation.
- 2) Develop a systematic way to gather information on long-term care service providers and on the costs of these services to get a better understanding of the supply side.
- 3) Prepare administrative records to make it easier to monitor government spending on long-term care.

As explained at the beginning of this note, the initial purpose of the simulation tool exercise presented here is to allow users to quickly see how the cost of the system changes as a function of the coverage of different long-term care services. However, the ultimate and long-term goal is to create a space for informed discussion about the need to implement long-term care systems in the region, and about the possibility of starting off at a smaller scale to then expand the system according to the growing needs of the population.

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Appendix 1. Description and discussion of the data used in the cost simulation tool

This section describes the sources of information used in this cost simulation tool, as well as how the data was handled.

Dependence on long-term care

The data on care dependence used in the cost simulation tool is generally taken from Aranco et al. (2018) and can be downloaded from the Panorama of Aging and Long-Term Care website (<https://www.iadb.org/en/panorama/indicators>). In some cases, more recent data from case studies on Argentina (Oliveri, forthcoming), Chile (Molina et al., forthcoming) and Costa Rica (Medellín, Jara Maleš y Matus-López, 2019) was used.²⁴ Currently, seven Latin American countries have household surveys that can be used to estimate their population's care dependence level.

Data from household surveys is limited in that they exclude people living in institutions, especially those living in residential care settings for older people, most of whom depend on long-term care. However, the percentage of older people who live in residential care settings in the region is considerably lower than in other parts of the world, such as the United States and Europe. Based on estimates from population censuses, around 0.4% of people over age 60 in Latin America live in a residential care setting, although the figure is considerably higher in Chile and Uruguay (1.9%),²⁵ and in Costa Rica (0.89%) (Sanders, 2019).

There are significant methodological differences in the way each survey identifies and measures care dependence. Three of these differences are very relevant to the cost simulation tool. First, the activities of daily living assessed to determine whether a person is care dependent differ between the surveys. Second, some surveys choose to identify whether people have difficulty performing activities of daily living, while others seek to establish whether the care-dependent person needs assistance. Third, the level of difficulty or need for assistance is measured differently in each of these surveys. These differences could partly explain the considerable disparities in level of care dependence recorded in the countries in the region. For example, the percentage of the population that is dependent on long-term care is 4% in Paraguay and El Salvador, but 19% in Mexico.

In terms of activities of daily living, the basic activities included in the different surveys overlap more than the instrumental ones. For that reason, it was decided to focus on

²⁴ These studies are available in the Case Studies section of the Panorama of Aging and Long-term Care (<https://www.iadb.org/en/panorama/case-studies>).

²⁵ Government data that is more recent than Uruguay's population census put the figure at 3% of the population of older people (Aranco & Sorio, 2018).

difficulties in performing basic activities of daily living only (Aranco et al., 2018²⁶) to achieve as much comparability as possible. This means the number of care-dependent people is underestimated, as people who have no trouble performing basic activities but do have difficulty performing instrumental ones are not included. As seen in Table A1.1., all surveys used in the tool cover difficulties with or need for assistance for eating or drinking and getting in and out of bed. However, getting dressed, bathing, and using the toilet are only included in some surveys.

The surveys identify care dependence in two ways: by inquiring about difficulties in performing activities (as is the case of CASEN of Chile and ENADIS of Costa Rica) or by inquiring about needs for assistance (in the case of ENCaViAM of Argentina). A binary variable (yes or no) is generally used to measure degree of difficulty or need for assistance. However, the surveys from Chile and Costa Rica use a scale of 1 to 5, where 1 represents no difficulty and 5 extreme difficulty. Table A1.1 contains the wording of the question on care dependence and the method for measuring difficulty in each country.

In most cases, the questions about care dependence only apply to older people (generally age 60 or older). The Chile and Costa Rica surveys are exceptions, as they collect information on care dependence starting at ages 6 and 18, respectively.

The cost simulation tool uses care dependence rates that are broken down by age group in order to reflect the effects of population aging on the national care dependence rate. To this end, five age groups were established (ages 0 to 17, ages 18 to 59, ages 60 to 69, ages 70 to 79, and age 80 or older), and the percentage of care-dependent people was estimated for each one.²⁷ This approach is similar to that taken by Wittenberg, Hu, and Hancock (2018), who in their projects assume that the disability rates for each age group remain constant over time.²⁸

²⁶ One exception is Uruguay; there is a more recent survey that was not used in the case study or in the Panorama.

²⁷ For Chile, the care dependence rate for the 6 to 17 age group is assumed to be the same as that of the 0 to 17 age group.

²⁸ The authors use five-year age groups for people ages 65 to 85, and two age groups for younger people: ages 18 to 30 and 31 to 64.

Table A1.1. Description of the surveys used to measure care dependence

Name of estimate	Survey	Year	Survey question	Type of response	Age	Basic activities					Notes
						Bathing	Eating or drinking	Using the toilet	Getting in or out of bed	Getting dressed	
Argentina	ENCaViAM	2012	Need for help from someone else to...?	Yes or No	60 and older	x	x	x	x		1
Argentina (expanded)						x	x	x	x	x	1 and 2
Chile(CASEN)	CASEN	2017	Given your health status, how difficult is it for you to perform activities?	Level of difficulty from 1 (no difficulty) to 5 (extremely difficult or impossible)	Over age 6	x	x	x	x	x	
Chile (ELPS)	ELPS	2015	In performing the following activities, do you usually need help from other people or have difficulties?	Yes or No	60 and older	x	x		x	x	
Costa Rica	ENADIS	2018	Difficulties performing activities due to the state of your health, without taking into account support products, services, service animals, or medications	Level of difficulty from 1 (no difficulty) to 5 (extremely difficult or impossible)	18 and older	x	x		x		
El Salvador	ELPS	2013	In performing the following activities, do you usually need help from other people or have difficulties?	Yes or No	60 and older	x	x		x	x	
Mexico	ENASEM	2015	Please state whether it is difficult for you to perform each of the activities I'm going to mention. If you don't perform any of the following activities, just tell me so. Do not include difficulties you think will last less than three months.	Yes, No, I can't, I don't, No response, I don't know	50 and older	x	x	x	x	x	3

Name of estimate	Survey	Year	Survey question	Type of response	Age	Basic activities					Notes
						Bathing	Eating or drinking	Using the toilet	Getting in or out of bed	Getting dressed	
Paraguay	ELPS	2015	In performing the following activities, do you usually need help from other people or have difficulties?	Yes or No	60 and older	x	x		x	x	
Uruguay (Official)	ELPS	2013	Is it usually difficult for you to perform the following activities?	Three levels of difficulty: Yes, always. Yes, moderately, and No	60 and older		x	x	x	x	
Uruguay (ELPS 2015)	ELPS	2015	Is it usually difficult for you to perform the following activities?	Three levels of difficulty: Yes, always. Yes, moderately, and No	60 and older		x	x	x	x	

Source: Adapted from the Excel file with the cost simulation tool.

Nota1. Argentina: The ENCAVIAM survey does not give the question about care dependence to people with severe cognitive or physical problems that make it impossible for them to respond to the survey.

Note 2. Argentina: The expanded definition of care dependence also includes combing hair, walking from one side of the house to the other, and going up and down stairs.

Note 3. Mexico: Though there is information on people 50 and older, only information for people 60 and older is used for the cost estimation tool. The survey may be filled out by an informed third party due to health or cognitive reasons or temporary absence. The question on identifying the difficulties performing activities does not apply to people, who in response to a previous question, said they had no difficulty performing each and every one of a series of activities. The question says: "Please tell me if you have any difficulty performing any of the daily activities I'm going to mention. Do not include difficulties you think will last less than three months." The list of activities includes difficulties specifically related to a health problem: walking several blocks, walking one block, remaining seated for two hours, getting up out of a chair after sitting in it for a long time, going up one flight of stairs without resting, leaning over, kneeling; bending over or squatting down, lifting or raising arms above the shoulders, pulling or pushing a large object like an armchair, lifting or moving objects heavier than 5 kilograms, picking up a 1-peso coin, and getting dressed (including putting on socks and shoes). This last question about getting dressed is used to align how care dependence is measured with other surveys.

Using the same definitions as other IDB publications (Aranco et al., 2018; González-González et al., 2019; Cafagna et al., 2019), the cost simulation tool considers people mildly or moderately care-dependent when they have difficulty performing one or two basic activities of daily living, and severely care-dependent when they have difficulty performing three or more activities.

The information on care dependence from household surveys that include sections on income make it possible to analyze the financial situation of care-dependent people. This information is used to model a copayment scheme that varies based on families' income level and estimate the amount that a national long-term care system could collect if the scheme is implemented. This information is only available for Argentina, Chile, and Costa Rica.

United Nations 2019 population projections

The cost simulation tool uses the most up-to-date version of the population projections from the population division of the United Nations (United Nations Population Division, 2019). More specifically, it uses the medium-fertility variant projection of population by age and gender based on annual historic data and estimates from 1950 to 2100.

Cost of the services

The supply of long-term care services is very limited in most Latin American countries. These countries usually have a small number of services offered by governments or nonprofits that focus on low income people with no family support. There is also a growing number of services offered by the private sector targeting the higher income segment, which includes both company employees and people who are self-employed.

There is no systematized information on the costs of long-term care services in the region. However, efforts have been made to compile illustrative information on costs based on surveys done in case studies and as part of the Panorama²⁹ and analysis from labor observatories³⁰ and other local sources such as González-González et al. (2019). The European Commission model's approach to the unit cost of services (2018: p.109) consists of using standardized information on government expenditure in the system of health accounts.

Job conditions in the long-term care industry are generally precarious, since informal employment, part-time jobs, little training, limited career options, and low pay are the norm, as are high levels of physical and mental stress. This is the characterization of the situation in European countries given by the Organisation for Economic Co-operation and Development in a working paper that discusses policies for attracting more workers to the

²⁹ Available at <https://www.iadb.org/en/panorama/case-studies>

³⁰ Labor Observatory of the National Employment Service in Mexico: <https://www.observatoriolaboral.gob.mx>.

sector, retaining them, and increasing their productivity (OECD, 2020). In the case of Uruguay, Aranco and Sorio (2018) also documented a high degree of informal employment (44%) among people who care for the elderly or disabled.

In an attempt to reflect better pay and higher-quality services, the costs suggested by the simulation tool are relatively high. However, its users can adjust these costs, as well as the number of hours of care per month, so they better match specific countries' actual costs. Table A1.2 lists the suggested monthly cost of each long-term care service.

In the general application of the model described in the body of this document, costs are assumed to remain constant in the future. This stands in contrast to the model developed by Maisonneuve and Oliveira Martins (2014, 2015), who incorporate changes in the relative prices of long-term care services, as well as a Baumol effect, into their projections. The section on simulation tool extensions explains how to modify costs in future projections.

Table A1.2. Summary of the cost of the services

Type of service	Monthly cost of the service (US\$)	
	Mild care dependence	Severe care dependence
Residential care setting	\$800	\$1,750
Personal home care	\$200	\$750
Day center	\$200	\$583
Telecare	\$35	\$70
Respite services	\$50	\$150

Source: Excel file with the cost simulation tool.

Other reference data

In the cost simulation tool, values are expressed in United States dollars (USD), and data on the gross domestic product (GDP) is used as a point of reference for describing the size of the systems relative to the size of the economy. The data used in the simulation tool are from the complete database of projections of the *World Economic Outlook* (WEO), published in October 2019 by the International Monetary Fund (IMF, 2019).

International Monetary Fund also estimates that the GDP of Latin America and the Caribbean will fall by 5.6% to 7.5% in 2020 (IMF, 2020) as a result of the economic crisis triggered by the measures to contain the COVID-19 pandemic. As of the publication of this note, more updated versions of the WEO only offer growth projections up to 2021.

Despite the out-of-date projections and the uncertainty about the effects of the crisis and the trajectory of recovery, expressing the values in relative terms is useful when it comes

to putting the size of the long-term care systems into perspective. Also, users have the option to enter external data in the simulation tool to adjust the projections.

Exchange rate data used by the IMF is provided to make it easier for users to convert costs to local currency.

Table A1.3. Additional reference data for the cost simulation tool

Data	Year	Source
Gross domestic product, exchange rate	2020, 2025, and 2030	<i>World Economic Outlook</i> (IMF, 2019)
Expenditure on non-contributory pensions	Around 2018	Database on non-contributory social protection programs in Latin America and the Caribbean (ECLAC, 2020)
Health expenditure	2017	<i>Global Health Observatory Data Repository</i> (WHO, 2020)
Public expenditure on fuel subsidies	2017	(Coady et al., 2019)

Source: Prepared by the author.

Another exercise used to put the size of long-term care systems into perspective is comparing it with public expenditure in other areas, such as non-contributory pensions, public health expenditure, and fuel subsidies. The sources for each are listed in Table A1.3

Appendix 2. Cost simulations for 2020 and projections for 2025

Table A2.1. Estimates of the cost of a long-term care system, 2020

	Millions of US\$			Percent of GDP		
	Example	Services 1	Services 2	Example	Services 1	Services 2
Argentina	2,962	2,060	1,767	0.67%	0.46%	0.40%
Chile	2,281	1,590	1,347	0.74%	0.52%	0.44%
Costa Rica	455	330	206	0.70%	0.51%	0.32%
El Salvador	201	141	114	0.72%	0.51%	0.41%
Mexico	13,433	9,584	6,811	1.02%	0.72%	0.51%
Paraguay	206	144	123	0.48%	0.34%	0.29%
Uruguay	366	261	188	0.58%	0.41%	0.30%

Table A2.2. Estimating the cost of a long-term care system in 2025 with a constant care dependence rate

Cost of the system in 2025 with a constant care dependence rate						
	Millions of US\$			Percent of GDP		
	Example	Services 1	Services 2	Example	Services 1	Services 2
Argentina	3,287	2,286	1,961	0.55%	0.39%	0.33%
Chile	2,725	1,898	1,610	0.68%	0.48%	0.40%
Costa Rica	568	412	258	0.68%	0.49%	0.31%
El Salvador	232	163	131	0.69%	0.48%	0.39%
Mexico	16,063	11,463	8,132	0.99%	0.70%	0.50%
Paraguay	250	174	149	0.43%	0.30%	0.25%
Uruguay	391	278	201	0.50%	0.35%	0.26%

Table A2.3. Estimating the cost of a long-term care system in 2025 with a 20% drop in the care dependence rate

Cost of the system in 2025 with a 20% drop in the care dependence rate						
	Millions of US\$			Percent of GDP		
	Example	Services 1	Services 2	Example	Services 1	Services 2
Argentina	2,630	1,829	1,568	0.44%	0.31%	0.26%
Chile	2,180	1,519	1,288	0.55%	0.38%	0.32%
Costa Rica	455	329	206	0.55%	0.39%	0.25%
El Salvador	185	130	105	0.55%	0.39%	0.31%
Mexico	12,850	9,170	6,506	0.79%	0.56%	0.40%
Paraguay	200	139	119	0.34%	0.24%	0.20%
Uruguay	312	222	161	0.40%	0.28%	0.20%

Source: Cost simulation tool example application.