



Performance of Care Homes for the Elderly in Chile against Covid-19

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November 2020

1 Introduction

The health crisis produced by the Covid-19 in 2020 has been one of the most important in the history of Chile and the world. Its magnitude forced multiple prevention and treatment efforts. One of the most relevant was to design and implement a plan to protect and treat the elderly living in Long-Stay Homes (in short, "care homes"). This, through a combination of (i) training and design of strict hygiene and safety protocols, (ii) preventive and reactive testing of residents and caregivers, and (iii) isolation, all of the above (iv) monitored by a technological platform aimed at controlling and detecting early outbreaks of the disease in order to act quickly.

The need for this project arose from the impact that the Covid-19 had had on the care homes (CH) of those countries where the pandemic was a few months ahead of Chile (Fallon et al., 2020). Unfortunately, at the same time, Chile was suffering the deepest social crisis in the last 40 years, triggered by the violence that erupted on October 18, 2019. The underlying cause was the lack of cohesion in Chilean society. This crisis partly explains why, surprisingly, Chile is one of the countries with the worst performance in the pandemic (Lincoln, 2020).

Until then, various actors had tried to address this situation through social dialogue. Although this had contributed to a greater understanding and rapprochement, it was necessary to move more decisively towards the materialization of concrete actions. For these to be effective, a set of capacities was required. No institution in the business world, the state or civil society had all these

¹ My thanks to the people who led the implementation of the project and who provided me with the information required for this document: Juan Sutil (CPC); Jacqueline Plass (First Lady's Cabinet, Country Commitment program); Octavio Vergara, Pablo Pizarro, Bernardita Bulnes and Andrea Escobar (SENAMA); Cristóbal Prado, Ángel Vargas and Juan Luis Moreno (ACHS); Pablo Leon (McKinsey & Co.). Finally, appreciate the help of Anushka Baloian.

capacities; they could only be achieved in a combined manner. For this reason, a team was formed that brought together organizations from these three estates.

From the private world, the Chilean Security Association (ACHS), the Confederation of Production and Commerce (CPC) and the strategic consulting firm McKinsey & Company participated. From the State, the cabinet of the First Lady (Country Commitment program) and the National Service for the Elderly (SENAMA). From civil society, the Simon de Cyrene Foundation, the Society of Geriatrics and Gerontology, and a number of foundations that operate various care homes.

The project included a set of prevention and mitigation actions that meant, by September 2020, saving 411 lives of older adults, according to an econometric model with 74 countries and regions of the developed world. This estimate also concluded that 1,468 infections of care home residents and 857 hospital admissions in critical hospital beds were avoided.

Given the magnitude and speed with which this project was conceived and initiated, at the end of April, and its auspicious results in comparison to what happened in Chile, this document aims to leave a record of the main events, evaluate the objective and subjective impact, and derive lessons for future contingencies, or to address various challenges facing our country now or in the future. The most important of these is the need to translate social dialogue into joint action among the different levels of society. Only in this way will it be possible to recover Chile's social cohesion and address the multiple challenges associated with demands for quality public goods.

2 An Alarm from Europe

In early 2020 the news of the impact of the Covid-19 was alarming. In countries such as Italy, Belgium and Spain, there was an explosion of infections and a consequent collapse of the health system (Hardy et al., 2020).

The most affected segments of the population were the elderly living in care home (Fallon et al., 2020). First, they suffered from various basic illnesses that made them especially vulnerable to Covid-19. The overcrowded condition of many homes made contact between them almost inevitable, so any outbreak would quickly become widespread. The overcrowded condition of many residences made contact between them almost inevitable, so any outbreak quickly became widespread. The lack of strict security protocols with care staff led to the entry of the virus into many residences, which meant that many staff members became infected and had to enter quarantine, and many who did not get sick, deserted their jobs for fear of the disease.

All of the above led to a widespread situation of abandonment, which in some countries had tragic results. In Canada, a care home was discovered with 31 deaths, whose survivors had not been fed or cleaned in days (Hsu et al., 2020). Something similar was reported in Spain, where residents lived for weeks with the bodies of their companions. This generalized situation was denounced by Doctors Without Borders (2020), demanding the implementation of contingency plans in accordance with the magnitude of the crisis. In May 2020, 81% of the dead in Slovenia were residents of care home, and 85.1% in Canada. In September, 91.4% were in Castile and Leon.

The expectation for Chile was alarming, comparing the standard of the European care homes and the Chilean ones (Villalobos Dintrans, Browne Salas & Madero-Cabib, 2020). In our country the situation was very heterogeneous, given the great social inequality that prevailed, reflected in a Gini

Index of 0.55. There are about 1,000 residences with a health resolution issued by the Ministry of Health (MINSAL), an agency that oversees compliance with minimum standards of health, hygiene and welfare. They house 26,300 residents in total, with mild, moderate or severe degrees of dependency. Of these, at least 330 care homes are non-profit and the rest are for-profit. It is estimated that 85% of the total charges US\$800,000 or less per month per resident, which is equivalent to the cost of operation.

Additionally, there are informal care homes for which there is not yet a complete record. Based on the information collected in the National Census, in all cases where five or more elderly people live in one house, it is presumed that a de facto care home operates there (Marín, Guzmán & Araya, 2004). According to the 2017 Census, the number of homes with these characteristics was 905, with a total number of 4,958 elderly people interned. As in the case of formal care homes, the great majority barely covers their operating costs, considering a minimum of staff in charge.

In summary, the vast majority of care homes, both formal and informal, are very precarious, both in their health and administrative management.

3 Social Crisis in Chile

The arrival of the pandemic in Chile found the country in the deepest social crisis of the last 40 years (Pons et al., 2020). Starting on October 18, 2019, several acts of violence and demonstrations broke out that surprised a large part of the population. Until then, Chile was generally perceived as an economic and democratic miracle; it went from being the eighth richest country in Latin America in 1975, to disputing first place as of 2015, being an almost unique example in the world of a relatively peaceful transition from a dictatorship to a democracy, and leading almost all Latin American indicators of social welfare, including longevity, education, health, and citizen security, among others.

Notwithstanding this apparent success of the development model, its neoliberal basis is essentially individualistic, and it can undermine social cohesion. In very broad terms, this cohesion has been weakened during the last decade by six major causes below. The last three would also have a very negative impact on Chile's ability to deal with the pandemic.

- 1) Unfulfilled expectations: The neoliberal model promises that personal effort is rewarded. This was fulfilled in the past, but there have been limitations in the present.
- 2) Perception of extreme inequality: The idea that Chile is a country of abusers and abused, both economically and legally, became widespread.
- 3) Sense of impunity of the elites: There were several cases of collusion and other bad business practices, most of which ended in exculpations.
- 4) Low quality public goods: The political class was not capable of confronting a modernization of the State that would allow for the provision of public goods adequate to the expectations of the population. Specifically, the health system was stretched to the limit during the pandemic.
- 5) Detachment from institutions: Many of the institutions that once generated national identification, such as the Carabineros (Police force) and the Catholic Church, fell into deep disrepute. Therefore, many of the instructions regarding prevention and containment of the disease were ignored by the population.

- 6) Massive immigration and destabilization of the labor market: Chile had to absorb a large number of immigrants, which put downward pressure on wages and produced unemployment. This population is in many ways marginal: they live in overcrowded conditions with little access to health and education, so it became a vector for the spread of the pandemic.

With the excuse of an increase in the Santiago Metro (underground train) fare, three simultaneous phenomena occurred:

- a) Massive protests: There were very massive marches and demonstrations, the one on Friday, October 25, with approximately 1.2 million people, being the most important.
- b) Vandalism and looting: A large number of supermarkets and stores were looted by unbridled mobs
- c) Incendiary attacks on the Metro, pharmacies, supermarkets and public buildings: Organized groups destroyed various facilities, producing chaos and shortages

Although (a), (b), and (c) have very different intentions, the fact that they occurred simultaneously made them mutually reinforcing. The result was an acute political and economic crisis, the likes of which had not occurred in Chile since the 1973 coup d'état. As noted by Bosancianu et al. (2020), this conflict situation led to a high mortality rate due to the pandemic, which eventually materialized.

4 Social Dialogue between Estates

Before and during the outbreak of violence, various institutions promoted dialogue between the different strata of society as a way to rebuild the cohesion of the country. By way of simplification, we will consider the following three strata:

- A) Traditional companies: They have been the engine of development of the Chilean economy. Their success has been transferred to the region, with several Chilean companies leading their respective industries in Latin America. Globally, in 2018 Chile was the leading exporter of 29 product categories.
- B) State, with its ministries, departments and uniformed institutions, and municipalities: These are the bodies that comply with the political will expressed in the country's laws. Their performance is above the Latin American standard, but below that of developed countries that are members of the Organization for Economic Cooperation and Development (OECD, 2019).
- C) Civil society or third sector: Includes non-profit corporations, universities, non-governmental organizations and foundations. They have specialized in social issues, including poverty, social security, education and the environment

There were many outstanding examples of social dialogue promoted by unions, universities and other institutions. The general conclusion of these activities was the high level of discrimination in Chilean society due to the lack of physical and social meeting spaces. In Chile, neighborhoods, schools, universities and sports clubs are segregated, and therefore just sitting down to talk produces opportunities for greater understanding.

The main criticism of these activities was the lack of consistent action. Discovering points of agreement is valuable, as long as they trigger concrete changes. However, the country was immobile; many reforms (good for some, bad for others), such as the reform of the Constitution,

had been bogged down for years. Dialogue was a necessary but not sufficient condition to resolve the deep crisis that would be exacerbated by the pandemic.

5 An Impossible Mission for Any Estate

Fighting Covid-19 required a set of state capabilities similar to those needed to deal with a national security crisis or war (Bosancianu et al., 2020). Cingolani (2013) classifies these capabilities into the seven explained below. Although the literature applies them to evaluate the strength of the state, in this context we understand them as national capacities, which can manifest themselves in the state but also in other strata.

1. Coercive: Allows citizens to be forced to do something, even against their will. Only the State has it in a legitimate way.
2. Fiscal: It makes possible the financing of complex actions. The State has it, but only in terms of volume of resources, not flexibility. Companies do have flexibility, but much less volume.
3. Administrative: It allows for the execution of complete actions in an efficient and effective manner. Chilean companies have a high execution capacity, as shown by their high competitiveness at the Latin American level. The State and civil society foundations are rather limited in this aspect.
4. Innovation: It enables the creation and implementation of new technologies and ways of working. Chilean companies have certain capacities of this type, but the State and civil society do not.
5. Territorial: It consists of the possibility of accessing any corner of the country in a timely manner. Businesses are rather local; however, the State and several foundations have wide national coverage.
6. Legal: It is the ability to guarantee the rights of citizens, especially in terms of social security. It is not the domain of the company, but of the State. Civil society also participates in this by implementing a support network for the most vulnerable citizens.
7. Policy and legitimacy. It consists of the credibility that the actions have from the point of view of society. Given Chile's unstable environment in 2020, only civil society had this credibility.

Table 1 shows the summary of these capacities and their presence in the three estates.

Table 1: Strategic Capabilities of the Stakeholders to Fight the Covid-19

	Capacity	Companies	State	Civil Society
1	Coercive (compelling citizens)	No	Yes	No
2	Fiscal (availability of resources)	Yes /No	Yes /No	No
3	Administrative (sophisticated execution)	Yes	No	No
4	Innovation (change)	Yes /No	No	No
5	Territorial (logistical coverage)	No	Yes	Yes /No
6	Legal (guarantee of rights)	No	Yes	Yes /No
7	Policy (social legitimacy)	No	No	Yes

From the table it is confirmed that no single estate could have all the required capacities on its own. Nor could two; companies and the State as a whole lacked social legitimacy. The state and civil society did not have sophisticated project management capacities. Business and civil society lacked the capacity to discipline the population. Only the three together covered the entire spectrum.

6 Gestation of the Alliance

Strategic orchestration is the combination of capabilities of two or more organizations, all of which are necessary (Chadwick, Super & Kwon, 2015). It is an alternative hypothesis to the more traditional idea that strategic capabilities should be internal (Grossman & Hart, 1986). In this case, the actors were coordinated in Table 2.

Table 2: Members of the Three Estates Alliance

Companies	State	Civil Society (selected)
CPC	SENAMA	Simón de Cirene Foundation
ACHS	Chilean President Cabinet	Society of Geriatrics and Gerontology
McKinsey & Co.		ACRUX Foundation
		Community of Solidarity Organizations
		Las Rosas Foundation (care home manager)
		Hogar de Cristo Foundation (care home manager)
		San Vicente de Paul Foundation (care home manager)
		CONAPRAN Foundation (care home manager)
		Villa Padre Hurtado Foundation (care home manager)

The gestation of this alliance had a very relevant personal component, which meant the advantage of mutual trust (Jenssen & Koenig, 2002). This contrasts with the vertical way in which the State

usually relates to companies: from client to contractor (Lindhols & Bogetoft, 2011). In turn, companies that contribute to civil society foundations often interact in a very limited way: the former deliver money and the latter are accountable (Burchell & Cook, 2008). This time, however, the interaction between the three tiers was horizontal and very intense.

The weakness of this spontaneous gestation is that it might not have happened if the right people had not been in the right place at the right time. This is the ambivalent role of strong personal ties in an organization: while they facilitate coordination, they do not guarantee that the structure can function regardless of which people are in which position (Grabher, 1993). This being the case, there is a risk that, in an upcoming crisis situation, the necessary teams will not be formed again.

7 Implemented Actions

The actions implemented can be classified as prevention and mitigation (Browne et al.). In terms of prevention, as of August 2020, the following has been done.

- Monitoring of 1,099 care homes, with a total of 22,200 residents and 21,600 employees.
- Implementation of a computer system for monitoring and early detection of outbreaks.
- Distribution of personal protective equipment (PPE) for the most vulnerable care home staff. With correct use, the probability of personnel infection is close to zero. 1.68 million masks, 2.24 million pairs of gloves, 1.3 million breast pads, and 13,000 goggles had been distributed among the 250 care homes
- Training in disease prevention and control measures. Knowledge transfer in the experience achieved, and development of protocols and good practices.
- Preventive PCR testing of workers and residents in a total of 11,979, identifying 628 positive cases.
- For the for-profit care homes, which were organized as an association for better coordination, the SENAMA provider teacher was made available, and training and PPE were provided to those with more vulnerable residents.

The following mitigation was carried out.

- Fitting out of isolation areas within care home.
- Fitting out of 19 "Mirror Transitory Residences" (MTR) in the event of not having effective insulation in the original care home.
- Hiring of 3,372 replacement employees for the personnel that had to be quarantined.
- For-profit care homes were provided with advice on implementing isolation, and those with more vulnerable residents were provided with MTR isolation and replacement personnel in the event of outbreaks.

The funding was public and private, with the following contributors:

- Besides the current budget of 10,696 (MUS\$), in July 2020 an additional 4,801 (MUS\$) was added to the intervention of the care homes.
- CPC donated 6,740 (MUS\$).

With 62% of the budget executed as of September 2020, Table 3 shows the classification of the main expenditures:

Table 3: Budget and Use of Resources

	Expenditure (MUS\$)	Percentage
Isolation (MTR and others)	8.727	39%
Staff Replacement	1.735	8%
Prevention (training, PPE)	8.256	38%
PCR and Rapid Test	1.470	7%
Operational Management	1.636	7%
Computer Platform	413	2%
	22.238	100,0%

8 Statistical Model

During September 2020 the results of the project were evaluated. For this purpose, a sample of 78 areas was considered for which the following relatively reliable information is available (Comas-Herrera et al., 2020)²:

- Number of deaths of care home residents by Covid-19.
- Number of residents in care home: in some cases, information on residents is available, in others on beds. We are considering the data indistinctly.
- Number of deaths by Covid-19 in the country-region.
- Total population of the country-region.

The areas are reported with the month of observation. Of the total, 18 are countries. We replaced the United Kingdom with three of its regions: England and Wales, Scotland and Northern Ireland; Spain by: The Community of Madrid, Catalonia and Castilla y León; and the USA by its states. In all cases, we check through a dummy variable if they behave in an idiosyncratic way or if we can consider them as independent observations.

In several aspects, the sample is similar to Chile:

- a) All countries and regions are large, except for Guam.
- b) The governments are democratic.
- c) Their culture is Western, except for South Korea, Honk Kong, and Jordan.

The main difference is that Chile is the lowest income country. Corrected by purchase parity power (PPP), its income is US\$25.15, versus US\$48.353 of the sample average. We discarded a comparison with similar and closer countries, for example, in Latin America, given the very low reliability of their statistics (Alvis-Zakzuk, Corral & Alvis-Guzmán, 2020).

With this data we calculate two variables:

$$\text{Mortality in care home} = \frac{\text{Number of Covid19 deaths of care home residents}}{\text{Number of residents at care home}}$$

² Complementary data sources are listed at the end of the document.

$$\text{Mortality outside care home} = \frac{\text{Number of Covid19 deaths in the country/region} - \text{Number of Covid19 deaths of care home residents}}{\text{Country/region population} - \text{Number of residents at care home}}$$

We evaluate two alternative regression equations:

1. Quadratic model:

$$CH\ mortality_i = \beta_0 + \beta_1 \times Non - CH\ mortality_i + \beta_3 Non - CH\ mortality_i^2 + \theta_i + \varepsilon_i \quad (1)$$

2. Exponential model:

$$\ln(CH\ mortality_i) = \beta_0 + \beta_1 \times \ln(Non - CH\ mortality_i) + \theta_i + \varepsilon_i \quad (2)$$

$CH\ mortality_i$ is the COVID-related mortality in care homes in country/region i , $Non - CH\ mortality_i$ is the COVID-related mortality outside of care homes, θ_i is a vector of control at the country/region level that includes Per capita GDP (PPP), Epidemiological week, Measurement approach³, and a dummy variable (Region) to allow for possible idiosyncratic behavior across states/regions within a country, and ε_i is a random error. Finally, we denote the natural logarithm of any variable " x " as $\ln(x)$.

The logic of these regressions is that the situation of the care homes should be strongly influenced by the situation outside of them. On the one hand, each care home "inherits" the viral load of their community through their staff and the visits that relatives make to the inmates. Additionally, their health management is determined by the level of education, professional capacity and material resources available in the sociodemographic environment. Given the relative size, causality essentially goes from the community to the care home.

8.1 Quadratic regression results

Table 1 exhibits the estimation results of equation (1). Overall, Non-CH mortality is positive and statistically significant at the 1% level across all specifications.⁴

The negative coefficient of its squared term suggests a concave relationship between the latter and CH mortality. Intuitively, an increase in mortality outside care home from, for example, 0.00% to 0.02% should have a much greater impact on mortality in care home than an increase in mortality outside care home from 0.10% to 0.12%. The first increase is critical for care homes; the second one is marginal.

³ Equal to 1 if the approach to measure Covid-related deaths is to include confirmed and probable cases, and equal to 0 in case it includes confirmed only.

⁴ The best available data were used in all areas considered. In the case of Chile, although the number of residents in the care homes is 23,600, we have official figures of 1,258 deaths for only 19,114 of them. Therefore, the observation in the regression is made with these official data.

Table 4: Quadratic regression results (CH mortality on Non-CH mortality)

	(1)	(2)	(3)	(4)	(5)
Non-CH mortality	161.722*** (18.570)	161.503*** (18.627)	157.002*** (18.966)	151.423*** (22.616)	151.424*** (22.764)
Squared non-CH mortality	-72,327.1*** (15,123.7)	-71,345.1*** (15,225.0)	-68,811.3*** (15,336.4)	-65,352.9*** (17,163.3)	-65,362.9*** (17,275.7)
Constant	-0.000 (0.004)	0.004 (0.007)	-0.023 (0.024)	-0.024 (0.024)	-0.028 (0.028)
Per capita GDP (PPP)		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Epidemiological week			0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Measurement approach				0.003 (0.007)	0.005 (0.010)
Region					-0.002 (0.009)
Obs.	78	78	78	78	78
R-squared	0.660	0.663	0.669	0.670	0.671

Standard errors are in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

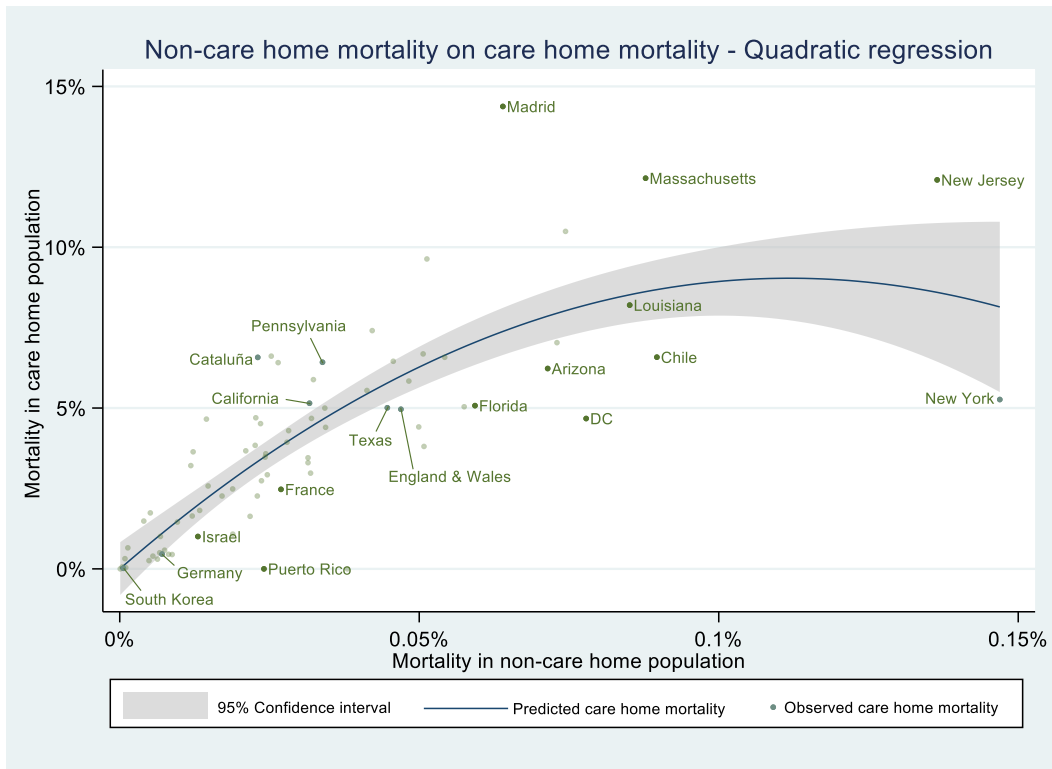
Across all specifications, the null hypothesis associated with the constant term ($\beta_0 = 0$) cannot be rejected, as it is not statistically significant. This result makes sense: if in a country/region the Covid-19 has not impacted, it is most likely that it will not impact its care homes either.

An additional candidate variable to explain the mortality in care homes is the country/region income, corrected for purchasing power (PPP). However, it is not significant in the regression equation (columns 2 through 5 of Table 4). Another potential explanatory variable that is discarded is the epidemiological week, which counts the time that has passed since the first death by Covid-19 in a country/region. However, this variable lacks statistical significance, possibly because of its collinearity with the variable of mortality outside care homes.

Finally, in some countries/regions, only confirmed deaths are accounted, while in other cases probable deaths are also included in the statistics. The quadratic regressions exhibited in columns 4 and 5 of Table 4 show that the Boolean variable that identifies both measurement approaches is not statistically significant. These results support the idea that it is the relationship between deaths within and outside the care homes what matters, which does not change significantly with one or another way of measuring the deaths.

Overall, Table 4 suggests that, in the quadratic specification, none of the control variables considered are relevant to explain care home mortality once Non-care home mortality is considered. That being said, we proceed to analyze the regression results of Model 1 (column 1 of Table 4). Figure 1 shows the predicted care home-mortality by country/region according to Model 1 (Table 4) with the corresponding 95% confidence interval and the observed care home-mortality.

Figure 1: Quadratic regression predictions



The expected value of our estimate for Chile is 8.68%, while the observed care home-mortality is 6.58%. This gap implies an improvement in mortality in care homes of -2.1%, which translates into a reduction in fatalities of 402 people.⁵ Since Chile's observed care home-mortality is located below the 95% confidence interval, we discard with 95% confidence the null hypothesis that, although our prediction has an expected value equal to 8.68%, it could be equal to the observed value of 6.58%. Table 5 displays the top-20 ranking of countries/regions according to the percentage of lives saved, which is equal to the gap between the predicted care home-mortality and the observed care home-mortality. According to these results, Chile is the fourth best-performing country/region.

⁵ $-2.1\% \times 19.114 = -402$. If, instead, we consider the total home care population of 23,600, avoided fatalities rises to 496.

Table 5: Ranking of countries/regions by care home's saved lives (%) – Quadratic model

Ranking (% saved lives)	Country/region	% saved lives	Saved lives (total amount)
1	DC	3.53%	70***
2	New York	2.88%	2536**
3	Nevada	2.54%	130***
4	Chile	2.10%	401***
5	Florida	1.97%	1267***
6	Michigan	1.86%	588***
7	Aragon	1.85%	407***
8	Montana	1.71%	63***
9	Arizona	1.63%	165***
10	Wisconsin	1.54%	306***
11	Tennessee	1.44%	358***
12	France	1.35%	8194***
13	South Dakota	1.07%	56***
14	Sweden	1.06%	875***
15	England & Wales (UK)	1.03%	4639***
16	Israel	0.98%	684***
17	Mississippi	0.91%	131***
18	North Dakota	0.91%	44***
19	Alaska	0.91%	6***
20	Wyoming	0.81%	17***

Notes: *** p<0.01, ** p<0.05, * p<0.1.

8.2 Exponential regression results

Table 6 exhibits the estimation results of equation (2). In contrast with the estimated coefficients of the quadratic regression (Table 4), controlling for the epidemiological week and the measurement approach is relevant in this model, as both coefficients are statistically significant (columns 3, 4, and 5).

Table 6: Exponential regression results (CH-mortality mortality on Non-CH mortality)

	(1)	(2)	(3)	(4)	(5)
Non-CH mortality (ln)	0.980*** (0.055)	0.977*** (0.055)	0.948*** (0.055)	0.799*** (0.073)	0.801*** (0.073)
Constant	4.642*** (0.475)	4.855*** (0.497)	3.031*** (0.966)	1.118 (1.128)	0.679 (1.196)
Per capita GDP (PPP)		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Epidemiological week			0.039** (0.018)	0.038** (0.017)	0.049** (0.020)
Measurement approach				0.741*** (0.254)	0.958*** (0.322)
Region					-0.270 (0.248)
Obs.	75	75	75	75	75
R-squared	0.811	0.816	0.828	0.846	0.849

Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Taking these results into account, we proceed to analyze the exponential regression's results considering the epidemiological week and the measurement approach as control variables. Figure 2 shows the predicted care home-mortality by country/region with the corresponding 95% confidence interval and the observed care home-mortality. The expected value of our estimate for

Chile is 8.70%. Again, as the observed care home-mortality is 6.58%, these results imply an improvement in mortality in care homes of -2.12%, which translates into a reduction in fatalities of 405 people.⁶

Analogously to the quadratic regression's results, Chile's observed care home-mortality is located below the 95% confidence interval, which allows us to discard with 95% confidence the null hypothesis. Table 7 displays the top-20 ranking of countries/regions according to the percentage of lives saved. Again, Chile is the fourth best-performing country/region.

Figure 2: Exponential regression predictions

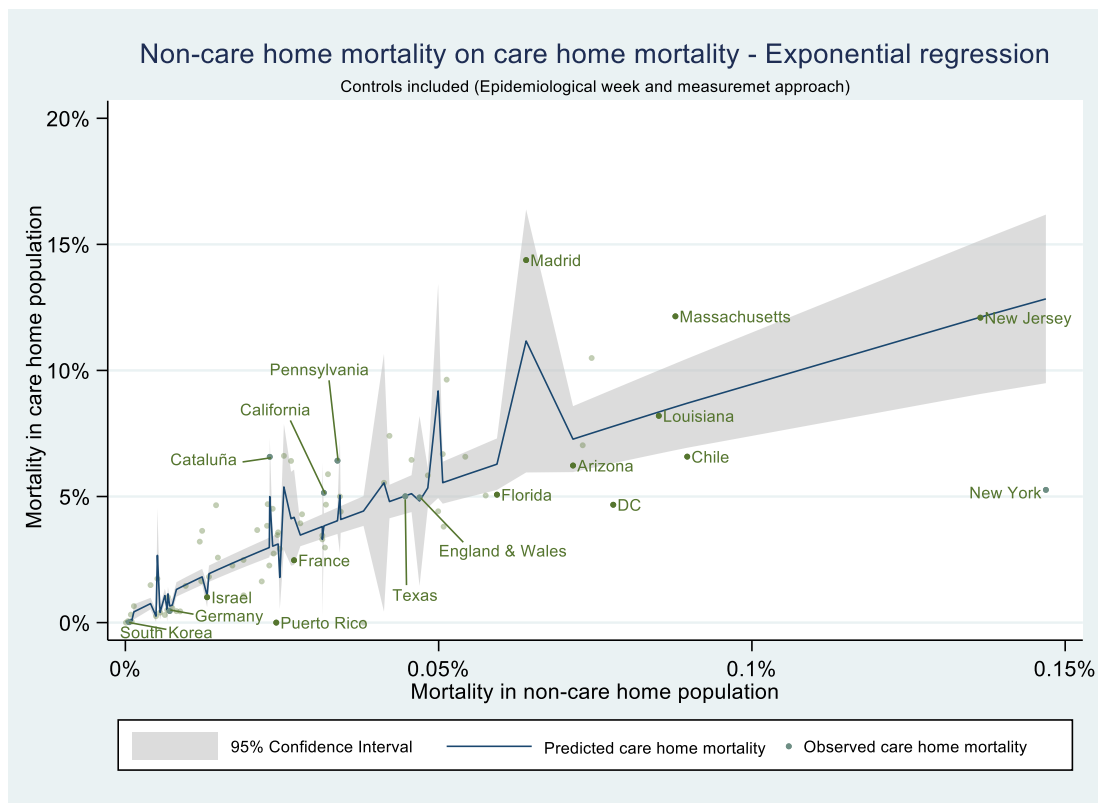


Table 7: Ranking of countries/regions by care home's saved lives (%) – Exponential model

Ranking (% saved lives)	Country/region	% saved lives	Saved lives (total amounts)
1	New York	7.572%	6669***
2	Aragon	4.775%	1050**
3	DC	3.112%	61***
4	Chile	2.120%	405**
5	Nevada	1.755%	89***
6	France	1.705%	10318*
7	Montana	1.469%	54***
8	Wisconsin	1.219%	242***
9	Florida	1.208%	777**
10	Michigan	1.091%	344**
11	Arizona	1.047%	106
12	Alaska	0.946%	6***

⁶ $-2.12\% \times 19114 = -405$.

13	Canada	0.927%	3946
14	Tennessee	0.875%	217***
15	Wyoming	0.862%	19***
16	Indiana	0.772%	270***
17	South Dakota	0.712%	38***
18	Mississippi	0.366%	52
19	North Dakota	0.356%	17
20	Idaho	0.307%	12

Notes: *** p<0.01, ** p<0.05, * p<0.1.

Overall, both the quadratic and the exponential specification suggest that Chile is among the four best-performing countries/regions regarding its ability to isolate care homes from the Covid spread and, therefore, prevent Covid-related deaths among them.

9 Project Impact

In addition to the number of lives saved among the residents of the care homes, the project had other relevant effects. In Chile, a policy was imposed that all elderly people who needed it should be placed in an Intensive Care Unit (ICU), which contrasts with the situation in other countries, such as France or Belgium. In the latter country, its geriatric society recommended that the elderly be allowed to die in the same ICUs, to avoid further collapse of the hospitals.

In order to calculate the liberation of hospital capacity, we considered that until September 9th 2,691 Covid-19 patients older than 70 years passed through the UCI of Chile, of which 1,299 died. This means a lethality of 48.2%. The deaths avoided do not pass through an ICU, that is, the effect of the project manifests before, not at the ICU itself. Therefore, the saved people avoided the ICU, which means that a total of $405/48.2\% = 840$ critical beds were freed⁷. The approximate stay of an elderly person in the ICU is 15 days if he dies and 30 days if he does not. They also stay 30 days in the Intermediate Treatment Unit (ITU). In summary, there was a saving of 19.132 ICU bed days and 13.057 ITU bed days. All of the above had the effect that the rest of the country did not face the last bed dilemma, although it was close. By June 2020, there were more than 2000 people connected to mechanical ventilators, which meant an occupancy rate of 95% in the metropolitan area and 91% nationwide (Villalobos Dintrans, Browne Salas & Madero-Cabib, 2020).

Another effect of avoiding fatalities is that a significant the spread of the disease was prevented. The lethality in Chile's care homes is 26.1%, which implies that the contagion of $405 \cdot (1/26.1\% - 26.1\%) = 1.446$ people was avoided.

Finally, there is a more challenging effect to quantify on the care homes' employees; the project reduced their objective risk of contagion as well as their fear of contagion.

10 Conclusions and Recommendations

The social and health crises of 2019 and 2020 have reminded us that Chile is a segregated society. We could speculate that it was the mistrust that arose from such segregation that produced in Chile one of the worst consequences of the Covid-19 in the world. Only social cohesion coordinates the

⁷ According to the exponential estimation.

capacities needed to face the great challenges, since it aligns wills, generates confidence and, in short, allows the country to act as a coherent whole.

Long before the social explosion, Chile advanced in the culture of dialogue, which produced valuable spaces of understanding. However, dialogue is not enough; there has been a lack of joint action to address society's major problems. Both in relatively limited aspects, such as the law of the notary's office, and in broad issues, such as the Constitution of the Republic, Chile has remained immobile, without being able to even discuss the issues. It is possible that after the discussion we can conclude that, following the example of the notary's offices and the Constitution, things are fine as they are; that cannot be known a priori. However, immobility generates greater distrust and segregation, which ultimately harms us and exposes us to future catastrophes as destructive as this pandemic.

The battle against Covid-19, in defense of Chile's care homes, has been a great counter-example of the above. In this case, due to more spontaneous than systematic causes, a wide range of private, state and civil society organizations were able to act together. The result is that in this specific aspect of the fight against Covid-19, Chile shows exceptional performance. In addition to having saved some 401-405 people by September 2020, it has saved infections and hospital admissions that have contributed significantly to alleviating the human and economic cost suffered by the country.

Other challenges remain, and we cannot bet that spontaneous networks of acquaintances will be re-organized. The three-estate partnership is unusual but feasible, and could serve as a model for addressing other problems, especially those related to social security. To this end, we must work on the formation of new consortiums, with a specific mission, command and means. If more time is left for better planning, even better results may be achieved.

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Appendix

Table 8: Data by Country/Region

Country/Region	Week	CH population	Measure approach	CH mortality	Non-CH mortality	Total COVID deaths	CH-COVID deaths	Population	GDPPC (PPP)
Alabama	42	20546	1	0.059	0.0003	2788	1209	4,903,185	\$37,261
Alaska	42	672	1	0.004	0.0001	67	3	731,545	\$63,971
Aragon	44	22000	1	0.044	0.0005	1613	971	1,307,984	\$33,351
Arizona	42	10179	1	0.062	0.0007	5827	634	7,278,717	\$38,590
Arkansas	42	15880	1	0.047	0.0003	1704	743	3,017,804	\$36,368
Australia	41	213397	0	0.003	0.0000	898	677	25,499,884	\$53,320
Austria	38	69730	0	0.004	0.0001	771	276	9,006,398	\$50,078
Belgium	41	125000	1	0.050	0.0003	10175	6249	11,589,623	\$54,545
California	42	86453	1	0.051	0.0003	16943	4452	39,512,223	\$58,619
Canada	40	425755	1	0.017	0.0001	9319	7411	37,742,154	\$51,342
Castilla y Leon	44	44300	1	0.066	0.0003	3528	2930	2,407,650	\$28,470
Cataluña	44	64093	1	0.066	0.0002	5968	4214	7,675,217	\$36,047
Chile	42	19114	1	0.066	0.0009	18690	1258	19,458,310	\$25,155
Colorado	42	14527	1	0.039	0.0003	2176	572	5,758,736	\$52,795
Connecticut	42	18127	1	0.105	0.0007	4542	1902	3,565,287	\$64,511
DC	42	1990	1	0.047	0.0008	641	93	705,749	\$174,140
Delaware	42	3469	1	0.074	0.0004	666	257	973,764	\$63,664
Denmark	41	40000	0	0.006	0.0001	663	232	5,792,202	\$59,830
England & Wales	38	449174	1	0.050	0.0005	49982	22287	59,439,840	\$36,138
Florida	42	64380	1	0.051	0.0006	15967	3267	21,477,737	\$39,543
France	41	605061	1	0.025	0.0003	32365	14955	65,273,511	\$49,435
Georgia	42	28779	1	0.066	0.0005	7638	1893	10,617,423	\$44,723
Germany	41	818000	0	0.005	0.0001	9615	3752	83,783,942	\$56,052
Guam	42	10	1	0.000	0.0004	63	0	165,768	\$35,600
Hawaii	42	3503	1	0.015	0.0001	187	51	1,415,872	\$51,277
Hong Kong	39	74500	0	0.000	0.0000	105	30	7,496,981	\$62,375
Hungary	35	55170	0	0.003	0.0000	612	142	9,660,351	\$33,979
Idaho	42	3869	1	0.027	0.0002	528	106	1,787,065	\$35,466
Illinois	42	57976	1	0.058	0.0005	9474	3385	12,671,821	\$54,091
Indiana	42	35053	1	0.003	0.0001	528	106	6,732,219	\$45,317
Iowa	42	21348	1	0.036	0.0002	1528	764	3,155,070	\$50,315
Israel	41	70000	0	0.010	0.0001	1824	704	8,655,535	\$42,194
Jordan	39	850	0	0.000	0.0000	9	0	10,203,134	\$10,316
Kansas	42	16072	1	0.023	0.0002	859	364	2,913,314	\$46,982
Kentucky	42	21209	1	0.036	0.0001	1317	772	4,467,673	\$38,985
Louisiana	42	22085	1	0.082	0.0009	5750	1811	4,648,794	\$43,917
Madrid	44	42000	1	0.144	0.0006	10327	6038	6,747,425	\$41,514
Maine	42	5462	1	0.010	0.0001	146	55	1,344,212	\$38,921
Maryland	42	19973	1	0.065	0.0005	4041	1289	6,045,680	\$55,404
Massachusetts	42	30472	1	0.121	0.0009	9725	3701	6,892,503	\$65,545
Michigan	42	31583	1	0.050	0.0006	7317	1592	9,986,857	\$43,372
Minnesota	42	21504	1	0.045	0.0002	2292	971	5,639,632	\$53,704

Mississippi	42	14346	1	0.070	0.0007	3171	1009	2,976,149	\$31,881
Missouri	42	35366	1	0.037	0.0002	2582	1298	6,137,428	\$43,317
Montana	42	3703	1	0.011	0.0002	241	40	1,068,778	\$39,356
Nebraska	42	10243	1	0.026	0.0001	548	264	1,934,408	\$53,114
Nevada	42	5123	1	0.038	0.0005	1757	195	3,080,156	\$43,820
New Hampshire	42	5821	1	0.047	0.0001	467	271	1,359,711	\$51,794
New Jersey	42	34209	1	0.121	0.0014	16211	4137	8,882,190	\$57,084
New Mexico	42	4886	1	0.044	0.0003	934	215	2,096,829	\$41,348
New York	42	88074	1	0.053	0.0015	33089	4637	19,453,561	\$64,579
North Carolina	42	33187	1	0.047	0.0002	3934	1559	10,488,084	\$44,325
North Dakota	42	4921	1	0.035	0.0003	408	170	762,062	\$62,837
Northern Ireland	39	14935	1	0.029	0.0002	900	437	1,893,667	\$27,893
Ohio	42	64650	1	0.035	0.0002	5067	2245	11,689,100	\$47,567
Oklahoma	42	16821	1	0.025	0.0002	1161	418	3,956,971	\$44,623
Oregon	42	6692	1	0.016	0.0001	620	110	4,217,737	\$50,582
Pennsylvania	42	65077	1	0.064	0.0003	8492	4180	12,801,989	\$50,997
Portugal	18	89666	1	0.005	0.0001	1125	450	10,196,709	\$36,471
Puerto Rico	42	96	1	0.000	0.0002	769	0	3,193,694	\$31,651
Rhode Island	42	6352	1	0.096	0.0005	1152	612	1,059,361	\$47,639
Scotland (UK)	37	35989	1	0.055	0.0004	4236	1996	5,463,300	\$38,603
Singapore	41	5112	0	0.001	0.0000	27	3	5,639,000	\$101,376
Slovenia	40	18500	0	0.007	0.0000	149	121	2,078,938	\$40,657
South Carolina	42	15711	1	0.067	0.0005	3650	1050	5,148,714	\$37,063
South Dakota	42	5343	1	0.023	0.0002	323	121	884,659	\$48,076
South Korea	36	156862	0	0.000	0.0000	336	27	51,269,185	\$43,029
Spain	41	322000	1	0.064	0.0003	32929	20649	46,754,778	\$42,214
Sweden	24	82217	1	0.033	0.0003	5863	2714	10,099,265	\$55,815
Tennessee	42	24895	1	0.030	0.0003	2909	741	6,829,174	\$43,267
Texas	42	81770	1	0.050	0.0004	17014	4096	28,995,881	\$53,795
Utah	42	5076	1	0.032	0.0001	543	163	3,205,958	\$44,636
Vermont	42	2220	1	0.015	0.0000	58	33	623,989	\$43,946
Virginia	42	24596	1	0.043	0.0003	3457	1057	8,535,519	\$51,736
Washington	42	13542	1	0.038	0.0002	2239	520	7,614,893	\$56,831
West Virginia	42	8856	1	0.018	0.0001	399	161	1,792,147	\$36,315
Wisconsin	42	19893	1	0.016	0.0002	1588	325	5,822,434	\$47,266
Wyoming	42	2203	1	0.005	0.0001	57	10	578,759	\$58,821

Notes: "Week" indicates the Epidemiological week of each country/region (weeks since the first confirmed case of COVID-19). "CH" is an acronym for Care Home. Measurement approach is equal to 1 if confirmed and probable COVID-19 deaths are included and 0 in any other case. "GDPPC (PPP)" displays the Gross Domestic Product Per Capita, adjusted for Purchasing Power Parity.

Table 9: Quadratic and Exponential model predictions by Country/Region

Country/Region	Quadratic prediction: CH mortality	Quadratic prediction: Saved lives	Quadratic prediction: Ranking	Exponential prediction: CH mortality	Exponential prediction: Saved lives	Exponential prediction: Ranking
Alabama	0.045	-291	63	0.039	-408	67
Alaska	0.014	6***	19	0.014	6***	12
Aragon	0.063	408***	7	0.092	1050**	2
Arizona	0.079	166***	9	0.073	107	11
Arkansas	0.044	-39	48	0.039	-129	54
Australia	0.001	-384	47	0.001	-405	43
Austria	0.009	331	29	0.004	8	36
Belgium	0.047	-391	49	0.050	62	30
California	0.044	-653	57	0.038	-1137	60
Canada	0.008	-3987	59	0.027	3946	13
Castilla y Leon	0.036	-1324	70	0.054	-547	59
Cataluña	0.033	-2074	71	0.050	-1011	64
Chile	0.087	402***	4	0.087	405**	4
Colorado	0.039	2	43	0.035	-68	48
Connecticut	0.080	-447	67	0.075	-540	72
DC	0.082	70***	1	0.078	62***	3
Delaware	0.055	-65	66	0.048	-90	71
Denmark	0.012	235*	26	0.007	45	26
England & Wales	0.060	4640***	15	0.048	-618	42
Florida	0.070	1268***	5	0.063	778**	9
France	0.038	8195***	12	0.042	10318*	6
Georgia	0.066	18	39	0.059	-207	51
Germany	0.011	5271**	24	0.007	1661	21
Guam	0.051	1***	-	0.044	0***	-
Hawaii	0.015	1	41	0.015	2	31
Hong Kong	0.002	88	37	0.001	19	32
Hungary	0.008	283	28	0.003	0	38
Idaho	0.034	26***	23	0.030	12	20
Illinois	0.061	162	34	0.053	-288	50
Indiana	0.010	240**	22	0.011	271***	16
Iowa	0.035	-15	45	0.031	-98	47
Israel	0.020	684***	16	0.011	47	28
Jordan	0.000	0	-	0.000	0**	-
Kansas	0.025	46	33	0.024	15	27
Kentucky	0.019	-375	64	0.018	-387	66
Louisiana	0.085	71	30	0.084	34	23
Madrid	0.074	-2938	75	0.112	-1347	73
Maine	0.011	3	40	0.011	7	24
Maryland	0.059	-116	55	0.051	-268	61
Massachusetts	0.086	-1074	74	0.086	-1094	74
Michigan	0.069	589***	6	0.061	345**	10
Minnesota	0.034	-240	60	0.030	-319	63
Mississippi	0.079	131**	17	0.074	52	18
Missouri	0.031	-209	56	0.028	-316	55

Montana	0.028	63***	8	0.025	54***	7
Nebraska	0.022	-36	52	0.021	-49	49
Nevada	0.063	130***	3	0.056	90***	5
New Hampshire	0.022	-144	68	0.021	-151	70
New Jersey	0.086	-1196	73	0.121	6	33
New Mexico	0.047	15	32	0.041	-15	45
New York	0.081	2536**	2	0.128	6669***	1
North Carolina	0.033	-465	62	0.030	-580	65
North Dakota	0.044	45***	18	0.038	18	19
Northern Ireland	0.035	92***	25	0.018	-169	57
Ohio	0.035	15	42	0.031	-235	46
Oklahoma	0.028	51	31	0.025	11	29
Oregon	0.018	14	36	0.018	10	22
Pennsylvania	0.046	-1159	65	0.040	-1551	69
Portugal	0.010	486*	27	0.005	0	40
Puerto Rico	0.035	3***	-	0.031	3***	-
Rhode Island	0.064	-206	72	0.056	-256	75
Scotland (UK)	0.054	-39	46	0.055	0	37
Singapore	0.001	0	44	0.001	1	35
Slovenia	0.002	-81	53	0.004	-42	44
South Carolina	0.063	-55	51	0.055	-178	58
South Dakota	0.033	57***	13	0.030	38***	17
South Korea	0.001	120	38	0.000	0	39
Spain	0.038	-8518	69	0.041	-7387	68
Sweden	0.044	875***	14	0.033	0	41
Tennessee	0.044	358***	11	0.039	218***	14
Texas	0.058	629***	21	0.050	14	34
Utah	0.018	-71	61	0.018	-73	62
Vermont	0.006	-19	58	0.008	-16	52
Virginia	0.040	-78	50	0.035	-197	53
Washington	0.033	-75	54	0.029	-122	56
West Virginia	0.020	18	35	0.019	11	25
Wisconsin	0.032	306***	10	0.029	242***	8
Wyoming	0.013	18***	20	0.013	19***	15

Notes: "CH" is an acronym for Care Home. Countries/regions with no Covid19 deaths among care home residents were not considered for the ranking (Guam, Jordan, and Puerto Rico). *** p<0.01, ** p<0.05, * p<0.1.