

Article

Dependency and Elderly Care: The Cost of the Long-Term Care System in the Context of the SDGs

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Abstract: The rapid ageing of populations around the world is creating complex challenges for national governments. The establishment of sustainable and equitable long-term care systems for old and dependent people is one of the main issues of social policy in developed countries. The aim of this work is to define a cost model for residential and day care centres for dependent persons in Cantabria (Spain). The cost model will make it possible to establish the theoretical cost of attending to the needs of the different types of dependent persons in the different types of care centres, and the methodology used could be extrapolated to other regions. The daily cost per user for elderly residential care is €53.72. The cost per user in elderly day centres (5 days) is 32.56 euros. In residential centres for people with disabilities, the values range between €47.41 and €75.25, depending on the category of the centre. In three categories of centres, the public price is not enough to cover the cost (physical disability, intellectual disability, mental illness—low care); therefore, the administration should reconsider their public prices for these kinds of centres if they want to really contribute to the sustainability of residential care centres. This research will have important implications for policy makers in the context of the fulfillment of the SDGs and where better support for old and disabled people and their carers, as well as fair and efficient financing of social care services, are essential to address the current and future challenges of dependency.

Keywords: dependency; elderly; long-term care; costs; Sustainable Development Goals; public policies; human rights



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1. Introduction

The 17 Sustainable Development Goals (SDGs) developed by the United Nations in 2015 provide 169 targets that the world must meet by 2030 in order to ensure well-being and prosperity for each person living with dignity and security in society. By committing to erasing inequalities, these SDGs are closely linked to human rights. Around the globe, older people are among the most vulnerable to marginalisation, poor health, poverty, and income insecurity [1].

For decades, Europe, in general, and Spain, in particular, have been undergoing a major demographic change, characterised by an ageing population, a reduction in the birth rate, and the internationalisation of the population through migratory processes.

The rapid ageing of populations around the world is creating complex challenges for national governments. Although people are living longer, it is not clear if these extra years are experienced in good health [2]. Addressing the needs of these older populations in a sustainable and equitable way will be a fundamental pillar of socioeconomic development in the 21st century.

In this context, the establishment of sustainable and equitable long-term care systems for old and dependent people and the promotion of their personal autonomy is one of the main issues of social policy in developed countries.

The World Health Organization (WHO) defines long-term care as “the activities undertaken by others to ensure that people with, or at risk of, a significant ongoing loss of intrinsic capacity can maintain a level of functional ability consistent with their basic rights, fundamental freedoms and human dignity”. The share of the population aged 80 years and over is expected to rise in OECD countries from 4% in 2010 to 10% in 2050. Expenditure on long-term care for the elderly is expected to increase from, on average, 1.5% of GDP in 2010 to more than 3% of GDP in 2050 [3].

In most OECD countries, the government has to manage tension between growth in the need for long-term care (LTC) services for older people and significant public budget constraints.

Ageing populations have forced national governments to control growing long-term care (LTC) public expenditure. This has resulted in an increasing centrality of cost-containment policies [4].

Cost-containment policies cluster in two areas according to their focus: demand-side policies, which reduce the actual chances of receiving LTC services and/or make them more expensive for users; and supply-side policies, which modify the provision of services. A comparison of the costs of residential care and home care shows that the former is more expensive for society. However, elderly people seem to be happier in residential care [5].

In this context of an ageing population and an increase in expenditure on long-term care, it becomes extremely relevant to have specific knowledge of all the costs of dependency care. This knowledge will help to determine policies for the control of public budgets.

2. Background in the Analysis of Costs of Dependency and Elderly Care

Three main gaps can be identified in the analysis of costs of dependency and elderly care.

Firstly, previous research studies about costs in care centres for elderly and disabled persons [6–17] have shown different results in relation to the quantification of costs, depending on the variables included in the quantification, the type of service analysed (mostly residential), and even the geographical area where the study was carried out.

This lack of consensus in previous literature is one of the most relevant gaps we want to cover by identifying the most relevant variables to measure the costs and how to measure them. Also, our study will cover not only elderly residential care (as most literature has done) but also day care and disabled people care.

Secondly, despite the important role played by cost considerations in policy decisions regarding services for the elderly and dependency, there has been relatively little reliable research on this topic, and this research will contribute to increasing knowledge about this topic. We must highlight that one of the main contributions of our paper is to empirically address the analysis of costs of dependency care, which has been seldom analysed in previous literature because of the difficulty of obtaining the data.

Thirdly, although social investment has recently received much attention among policy makers and welfare state scholars, the existing literature remains focused on policy making on the macro level [18]. However, more research focus on the micro level is needed. This study is focused on a micro-level analysis of 68 dependency centres located in the region of Cantabria (Spain). Without knowledge of all the costs involved in long-term care activities, it will not be possible to establish policies that guarantee the sustainability of the system.

In Spain, the number of dependent people in June 2023 was 1,547,544, an increase of 18.6% over 2018 [19]. This rise presents major challenges to families, formal care services, and public and private budgets. Understanding the economic consequences of such a prevalent condition is essential to engaging the public and encouraging policy makers to invest in appropriate treatment, care, and support.

In Spain, the Act 39/2006 of 14th December was passed to create a new System for Promotion of Personal Autonomy and Assistance for Persons in Situation of Dependency. This Dependency Act granted universal entitlement to social services with eligibility set on the basis of degree of dependency [20].

The Spanish care system was developed during the economic boom in 2006 but implemented during the bust years. According to [21], this fact may have consolidated informal care through the economic compensation of mainly family carers. However, the increase in combined formal and informal care could be because of the preferences of potential family caregivers or due to a lack of alternatives because of the cost of formal care.

In 2021, two major milestones took place in the field of the dependency care sector in Cantabria (a region in the north of Spain), which, up to that time, questioned whether public prices could cover the costs of the service. On the one hand, the publication of Order EPS/6/2021 of 26 March regulating the material and functional requirements of the specialised social services centres and the accreditation requirements of the dependency care centres in the Autonomous Community of Cantabria, which, among other issues, regulates the ratios of professionals that the centres must have. On the other hand, the publication of Order EPS/16/2021 of 27 May, which sets the public prices of the services of the Cantabrian Institute of Social Services for the care of dependent people.

In this context, there is a need to analyse the real costs of residential and day care centres for dependent persons in Cantabria in order to define policies for the sustainability of long-term care, taking into account all the costs necessary for the exercise of the activity.

Therefore, this paper will answer the following questions:

- What are the main costs that should be taken into account when considering residential and day care for elderly and disabled people?
- What is the cost per user in residential and day care centres for elderly and disabled people?

The answer to the above questions will let us contrast the following hypotheses:

Hypothesis 1. *Are there differences in the cost per user when we distinguish different types of dependent persons (elderly or disabled) in the different types of care centres?*

Hypothesis 2. *Do public prices paid by the regional government cover the costs of attending dependent persons in each kind of centre?*

This research will have important implications for policy makers in the context of the fulfillment of the SDGs and where better support for old and disabled people and their carers, as well as fair and efficient financing of social care services, are essential to address the current and future challenges of dependency. It will also have important implications for academics because it contributes to closing the gaps found in previous literature, and although the empirical research is done in a specific region, the methodology could be extrapolated to other regions.

3. Materials and Methods

3.1. Sample

The sample under study is made up of the universe of care centres for dependent persons in the region of Cantabria (including both care for the elderly and care for disabled persons). Specifically, the sample under study is made up of 167 centres with 9618 authorised places, of which 60.7% are in homes for the elderly and 13.3% in day centres for the elderly, so that almost 74% of the places are linked to elderly people.

3.2. Methodology

In order to estimate the cost of long-term care, quantitative information was collected through a questionnaire sent to those responsible for the centres. This questionnaire allows us to collect information at a micro level and to establish a real primary source of information for the estimation of the cost per user in residential and day care centres for elderly and disabled people.

The questionnaire had five groups of questions: general characteristics of the centre (such as name, starting date, category of centre (the regulation about centres for elderly and

disabled people in Cantabria recognises 16 types of centres with different kinds of users and different staff requirements; this study will analyse the cost per user in each type of centre), number of users, size, etc.); initial investments (in land, buildings, furniture, etc.); staff costs; other operational costs (such as feeding, supplies, cleaning, etc.); and financial information (such as financial sources and financial costs).

A first draft of the questionnaire was shared with those responsible for the centres on the 28th of June 2021 in a virtual meeting to check that the questions were in line with the reality of the sector. The final questionnaire was designed with the suggestions of the 26 participants in the meeting.

Data collection was carried out during the third quarter of 2021 (although the collection of information was done in 2021, the questionnaire asked for information from December 2019, the last complete year before the pandemic, because data from 2020 could be biased by the pandemic. Then, we considered the inflation rate to convert the information into 2021 data), with a total of 68 responses and a response rate of 40.7%. The sampling error for a confidence level of 95% is 9.18%, taking into account the number of centres and 1.17% if the number of authorised places is considered. Since the study sample includes the largest dependency care centres in the region, the results obtained are broadly representative.

To estimate the cost of dependency and elderly care, the following steps have been followed:

- Analysis of the answers given in the questionnaire by the person responsible for each centre about the costs they support for each person attended.
- Considering the 5 groups of questions established in the questionnaire, we identified 13 cost variables for each kind of centre. Sixteen categories of residential and day care centres were considered according to the classification established in Cantabria's regulations.
- Definition of hypotheses to calculate the value of each variable and verification of the coherence of the hypotheses using previous literature and different sources of information.
- Calculation of the cost per user for each kind of centre and comparison with the public price offered by the regional government to these centres.

3.3. Variables

Table 1 summarises the 13 cost variables that have been considered to estimate the cost per user in residences and day care centres for the elderly and disabled. The details about the estimation of each cost variable are explained in the Section 4.

Table 1. Summary of variables included in the cost model.

Cost	Variables	Source Used
Depreciation of buildings and equipment	Residential centres:	
	• Initial investment in buildings and equipment = 69,761.62 €/user • Size = 47.35 m²/user	
	Day centres	
	• Size = 7 m²/user • Initial investment in building and equipment = 14.8% × initial investment in residential centres	• Questionnaire to the people responsible for the centres • Interviews with operators in the sector • Review of previous literature • Order EPS/6/2021
	Amortisation period	
	35 years—Buildings	
	5 years—IT equipment	
	10 years—other equipment	

Table 1. Cont.

Cost	Variables	Source Used
Staff cost	Staff costs = Annual basic salary stipulated in the collective agreement according to professional category + possible night, Sunday and public holiday bonuses + 32.5% of social security + additional staff costs of 11.04%.	• Questionnaire to the people responsible for the centres • Review of previous literature • Order EPS/6/2021 • Collective agreements and salary tables applicable to the sector (the 15th General Collective Agreement for Centres and Services for the Care of Persons with Disabilities and the 7th State Framework Collective Agreement for Services for the Care of Dependent Persons and Development of the Promotion of Personal Autonomy).
Other operating costs	Feeding Supplies (electricity, gas, water, telecommunications) Materials (office supplies, sanitary consumables, textiles ...) Insurance Maintenance and repairs Cleaning Security Administration and management Other costs (banking services, data protection, etc.)	• Questionnaire to the people responsible for the centres
Safety margin	% of total operational cost	• Questionnaire to the people responsible for the centres • Review of previous literature
Financing costs	$(\% \text{ of long-term external financing} \times \text{Cost of long-term external financing} \times \text{Start-up Investment} + \% \text{ of other sources of funding} \times \text{Cost of other sources of funding} \times \text{Start-up Investment}) / 365$	• Questionnaire to the people responsible for the centres • Review of previous literature

4. Results

4.1. Initial Investment: Land and Building Costs per User

The investment required for the start-up of a long-term care centre is high, mainly because of the building costs (new construction or refurbishment of an existing one). This cost must be taken into account when calculating the cost per place in the centre, as this initial investment will deteriorate and be amortised over time.

The information on the investment for the start-up of long-term care centres (including construction and equipment) in Cantabria varies from one centre to another. In fact, on a national level, the existing information on the volume of such investment also differs from one study to another, varying between 36,000 euros/place, excluding land and 75,000 euros/place. Thus, the following references are available:

- [10]: 36,000–60,000 euros/user (excluding land)
- [22]: 48,000–75,000 euros/user
- [9]: 56,199 euros/user (excluding land)
- [15]: 40,000 euros/user
- [23]: 65,000 euros/user (excluding land)
- Experts in the sector in Cantabria through personal interviews in 2021: 50,000–60,000 euros/user

In Cantabria, the analysis of the 68 centres that provided information allows us to draw a series of conclusions in relation to residential centres (Table 2), without there being significant differences when distinguishing between centres for the elderly and centres for the disabled:

- The average investment per user, both in land and building and all the equipment necessary for start-up, amounts to 69,761.62 euros/place in residential centres (48,373.33 euros/place, excluding land). This value is in the range of values of the average investment per place in previous studies.
- Investment in buildings, land and infrastructure represents 78.2% of the total (68.6% if the investment in land is not considered because it is not depreciable).
- Investment in other equipment (furniture, vehicles, IT equipment, etc.) represents 21.8% of the total (31.4% if land investment is not considered).

Table 2. Structure of the initial investment of Cantabria’s long-term care centres. Average investment per place at the start of the activity according to the answers provided in the questionnaires.

	Residential Centres		
	Considering Investment in Land	Excluding Investment in Land	
	Mean Value	%	%
Land	21,388.29	30.7%	
Buildings (acquisition or refurbishment)	24,564.74	35.2%	50.8%
Infrastructure	8614.86	12.3%	17.8%
Furniture	6550.28	9.4%	13.5%
Transport vehicles	1616.28	2.3%	3.3%
Computer equipment	1638.75	2.3%	3.4%
Physical rehabilitation equipment	215.84	0.3%	0.4%
Cognitive rehabilitation equipment	139.1	0.2%	0.3%
Other	5033.48	7.2%	10.4%
Total	69,761.62	100.0%	100.0%

In relation to the investment in day centres, the great variability in the responses to the questionnaire made it necessary to establish a theoretical cost based on the following hypotheses:

- The average value of floor area per residential care user in Cantabria is 47.35 m², according to the responses to the questionnaire. This value corresponds to that observed on average in previous studies, in which the size of residential centres per user ranges between 40 m² and 73 m² [9,11,13,16].
- The minimum useful surface area per authorised place in day centres, according to Order EPS/6/2021, is 7 m².
- Therefore, the size per user in day care centres represents 14.8% of the residential place, which can be extrapolated to the investment. If the investment per user in a residential centre, on average, turned out to be 69,761.62 euros, the investment in a day centre should be 10,324.7 euros.

The initial investment is attributable to the cost per user in the centre through depreciation. The depreciation period considered for buildings is 35 years, for computer equipment 5 years, and for other equipment 10 years (in accordance with the usual practice in the sector, as indicated in the answers to the questionnaire).

In summary, the average cost linked to the amortisation of buildings and equipment in residential centres is 6.59 euros/place and in day centres 1.27 euros/place.

4.2. Fixed and Variable Costs

The annual costs of the activity include the expenditure necessary to carry out the activity even if there are no customers. This concept includes both variable costs (those that depend on the volume of occupancy) and fixed costs (those that are independent of occupancy). The occupancy rate of the 68 centres analysed in Cantabria is 90.24%.

4.2.1. Staff Costs

The centres surveyed in Cantabria provided information on the cost of staff per user, with a high degree of variability. Therefore, the theoretical personnel cost that the centres should have is calculated, taking into account the human resources and personnel organisation requirements established by Order EPS/6/2021 and the collective agreements and salary tables applicable to the sector (the 15th General Collective Agreement for Centres and Services for the Care of Persons with Disabilities and the 7th State Framework Collective Agreement for Services for the Care of Dependent Persons and Development of the Promotion of Personal Autonomy).

For the calculation of staff costs, the following formula was used:

Staff costs = Annual basic salary stipulated in the collective agreement according to professional category + possible night, Sunday and public holiday bonuses + 32.5% of social security + additional personnel costs bonus of 11.04%.

The questionnaire asked for information about additional staff costs that care centres have annually, and in particular about:

- Night bonus
- Public holiday bonus
- Experience/Seniority
- Specific training
- Prevention of occupational hazards
- Equality plans, improvement actions, etc.
- Replacements, departures, etc.
- Other

The percentage that the amount for all these items represents of the wage costs in the centres surveyed is, on average, 13.13%. If we exclude the amount for night work and public holidays (which is regulated in the collective agreement), the percentage drops to 11.04%.

Therefore, an increase of 11.04% in staff costs is hypothesised for additional costs derived from substitutions, seniority, or risk prevention, among others.

The theoretical personnel cost according to Order EPS/6/2021 and the applicable collective agreement, as well as its comparison with the personnel cost revealed in the replies to the questionnaire, are shown in Table 3.

Table 3. Theoretical staff cost according to Order EPS/6/2021 and applicable collective agreement.

		Staff per User Ratio	Order EPS/6/2021 Staff Costs per User and Day (Collective Agreement)	Staff Costs per User and Day (+11.04%)	Staff Cost in the Questionnaire	Variation Questionnaire vs. Order EPS/6/2021
Residential care	Elderly	0.46	26.36	29.27	34.57	18.1%
	Physical disability	0.60	39.3	43.64	37.83	−13.3%
	Intellectual disability	0.55	35.58	39.51	37.83	−4.2%
	Mental illness—Closed regime	0.69	45.06	50.03	37.83	−24.4%
	Mental illness—High care	0.67	43.6	48.41	37.83	−21.9%
	Mental illness—Low care	0.64	40.5	44.97	37.83	−15.9%
	Mental illness—Psychogeriatrics	0.66	44.5	49.41	37.83	−23.4%
	Basic attention—Physical disability	0.42	26.64	29.58	44.68	51.0%
	Basic attention—Intellectual disability	0.33	20.91	23.22	44.68	92.4%
	Basic attention—Mental illness	0.33	20.91	23.22	44.68	92.4%
Day care	Elderly 7 days/week	0.32	19.11	21.22	33.78	59.2%
	Elderly 5 days/week	0.23	18.63	20.69	33.78	63.3%
	Physical disability	0.39	35.73	39.67	44.4	11.9%
	Intellectual disability	0.35	32.76	36.38	44.4	22.1%
	Occupational	0.19	19.27	21.40	22.38	4.6%
	Psychosocial rehabilitation center	0.19	20.97	23.29	21.31	−8.5%

On average, staff costs are structured as follows: direct care 73.7%, administration 11.4%, and general services (maintenance, cleaning, kitchen, etc.) 14.9%.

Staff costs per user and per day (Table 3) in elderly residential care centres amount to €34.57 (according to the answers to the questionnaire), which is 18.1% above the €29.27

that would result from the application of the Order. In elderly day centres, it is €33.78 (63.3% above the €20.69 that would result from the application of the Order in 5 days/week centres). These differences between what the people responsible for the centres answer in the questionnaire and what the regulation says it should be led us to consider the results obtained when applying the regulation. These differences are also observed in care centers for disabled people, and the same criteria as for the elderly were used.

4.2.2. Other Operating Costs

This section quantifies other operating costs of the centres, which are derived either from services provided directly by the centre or from outsourced services. All the values in Table 4 are obtained from the answers to the questionnaire given to the people responsible for the centres and are contrasted with the evidence observed in previous studies that analyse the costs in dependency care centres. In all cases, the values obtained for the region of Cantabria are in line with those observed in other studies carried out in other regions.

Table 4. Other operating costs in residential and day care centres for old and disabled people.

	Residential Centres €/User/Day	Day Centres €/User/Day	Evidence from Other Studies
Feeding (the feeding cost includes the cost of food, but not staff costs, which would be part of the staff cost variable)	4.12	3.07	Similar to that observed in the [24,25] studies
Supplies (electricity, gas, water, telecommunications)	1.95	1.29	Between €0.71 [7,8] and €2.33 [13]
Materials (office supplies, sanitary consumables, textiles, etc.)	0.42	0.22	
Insurance	0.24	0.24	Between €0.19 [17] and €0.30 [24]
Maintenance and repairs	1.66	0.71	Between 0.66 € [7,8] and €1.09 [13]
Cleaning	1.89	0.61	Between €0.28 [24] and €0.80 [17]
Security	0.15	0.09	
Administration and management	1.42	1.42	Below the cost observed in [13] of €3.5 or in [16] of €3.9
Other costs (banking services, data protection, etc.)	1.43	0.88	

4.3. Profit Margin

According to the centres surveyed in Cantabria, the average profit margin is 4.19%, with wide variability in the results, mainly in day centres (Table 5); 22.06% of the centres report losses and 33.82% of the centres present profit margins of less than 5% (Table 6).

Losses are mainly concentrated in the smaller centres with less than 50 users; 13 out of the 15 centres reporting losses have fewer than 50 users (Table 7).

According to previous studies, profit margins are around 8–12% [6] or 10–15% [7], depending on the type of centre.

Table 5. Profit margin (in %) per user according to the type of centre and the type of user.

Type of Centre	No. of Centres	Mean	Standard Deviation	Minimum	Maximum
Residences	28	2.18	6.26	−14.36	13.26
Day centres	36	5.75	13.03	−38	35
Total	64	4.19	10.69	−38	35
Type of User	No. of Centres	Mean	Standard Deviation	Minimum	Maximum
Elderly	31	6.49	7.15	−38	21.34
Disabled	33	2.04	12.94	−1.15	35
Total	64	4.19	10.69	−38	35

Table 6. Profit margin (percentage and number of centres).

	Percentage	No. of Centres
Losses	22.06%	15
Less than 5%	33.82%	23
Between 5 and 15%	26.47%	18
More than 15%	11.76%	8
Ns/Nc	5.88%	4
Total	100.0%	68

Table 7. Profit margin by size of centre.

Size of the Centre	No. of Centres	Mean	Standard Deviation	Minimum	Maximum
Less than 50 users	43	3.29	12.32	−35	38
Between 50 and 100	12	6.55	7.50	−1.37	20
More than 100	9	5.36	3.42	0	11
Total	64	4.19	10.69	−38	35

References [9,10,24] establish a commercial margin in residential care centres of 7%. The particularity of these studies is that they only consider in their analysis centres for elderly residential care, thus leaving out of the study centres for the disabled or day care centres, which will be taken into account in this research. Also referring to residential care centres, the studies done by [15,17] observe higher profit margin values of 7.5% and 8.4%, respectively.

In contrast to previous studies, the authors in [13] consider that the profit margin should not be part of the cost in any type of centre. However, they recognise that centres need to have a safety margin that allows them to face unexpected needs in their financial and cash management, and although there is no consensus about the size of this safety margin, a recent study has set it at around 5% [26].

According to the above information, a safety margin of 4.17% of the total cost, which is the average value of the profit margin observed in Cantabria, will be considered as a safety margin for the care centres when calculating the cost model.

4.4. Financing

As shown in Table 8, on average, 60% of financing comes from self-financing, 20% from long-term external financing (loans from banks or similar institutions), and 19% from other sources of financing (mainly credit accounts and factoring).

Table 8. Sources of financing of the dependent care centres in Cantabria.

	Financing Structure	Average Cost (%)	Standard Deviation (%)	Minimum (%)	Maximum (%)
Self-financing	60.5%				
Long-term external financing	20.1%	2.42	2.12	0.18	8
Other sources of funding	19.4%	0.74	1.08	0	2.78

The average cost of long-term borrowing is 2.42%, while the cost of other sources of financing is 0.74%.

This cost of financing is in line with the evolution of interest rates published by the Bank of Spain in relation to mortgage loans (which in the period 2014–2019 presented an average value of 2.23%).

Evidence shows that financial costs represent a small percentage of the total cost in previous studies. The authors in [13] consider a daily cost per user of €0.14 (representing 0.3% of total costs). Reference [8] considers a financial cost of €0.93/user/day in mini-residences with 50 places and €0.58 in residences with 100 places.

In any case, it seems necessary to consider the explicit costs of financing the investment necessary for the start-up of the centre (already defined above), taking into account the structure of such financing.

In particular, the following financing costs are established:

– Residential centres:

$$(20.1\% \times 2.42\% \times €69,761.62 + 19.4\% \times 0.74\% \times €69,761.62)/365 = 1.2 \text{ euros/user/day}$$

– Day centres:

$$(20.1\% \times 2.42\% \times €10,324.7 + 19.4\% \times 0.74\% \times €10,324.7)/365 = 0.18 \text{ euros/user/day}$$

4.5. Results of the Estimation of the Total Cost per User in Each Type of Centre

Having defined the 13 variables that will be used to estimate the cost per user and the information on which they are based, we summarise their values in Table 9.

Table 9. Summary of variables and assumptions for calculating the cost model (values expressed in €/user/day unless otherwise stated).

Staff Cost (Residential/Day Care) Agreement in 2021 + Other Staff Costs (11.04% × Staff Cost (Residential/Day Care) Agreement)			
A	=Total Staff Costs		
	Other Operating Costs (Value in 2019)		
		Residential Centre	Day Centre
	Depreciation on buildings and equipment	6.59	1.27
	Feeding	4.12	3.07
	Supplies	1.95	1.29
	Materials	0.42	0.22
	Insurance	0.24	0.24
	Maintenance	1.66	0.71
	Cleaning	1.89	0.61
	Security	0.15	0.09
	Administration and management	1.42	1.42
	Other costs	1.43	0.88
B	Total other operating costs	19.87	9.8
	Cost of financing	1.20	0.18
C	Total other operating and financial costs	21.07	9.98
	Value converter from 2019 to 2021 (6% increase (This increase considers the evolution of inflation in Spain between 2019 and 2021))		
D	6% × Total other operating and financial costs		
	Margin (4.19% on total operating cost to 2021)		
E	4.19% × (Total staff costs + Other operating costs)		
	Total costs		
	A + C + D + E		

The results of the application of the above assumptions to the calculation of costs in elderly and disabled people care centres are shown in Table 10.

The cost analysis has been carried out considering the staff cost that the centres should assume in accordance with the staffing requirements established in Order EPS 6/2021 for each type of centre, which makes it possible to distinguish between 16 categories of centres. Once the personnel cost has been calculated, the rest of the operating costs are added, as well as the financing costs and the safety margin, to calculate the total cost per user and day.

In the case of day centres for people with disabilities, the cost of feeding is not included in the cost of the centres, as the current regulations do not require feeding services in these centres, so this concept cannot be included in the calculation of the cost. If any centre provides this service, the user pays the cost in full.

Table 10. Cost per user and day (with staff costs based on EPS Order 6/2021).

		Staff Ratio	Staff Costs per User and Day (Collective Agreement)	Staff Costs per User and Day (+11.04%)	Other Costs 2019	Other Costs 2021	Safety Margin 4.19%	Total Costs 2021	Public Price	Deficit or Surplus (Public Price-Total Costs)	Staff Costs/ Total Costs
Residential care	Elderly	0.46	26.36	29.27	21.07	22.33	2.11	53.72	57.46	3.75	54.5%
	Physical disability	0.6	39.3	43.64	21.07	22.33	2.71	68.69	68.44	−0.24	63.5%
	Intellectual disability	0.55	35.58	39.51	21.07	22.33	2.54	64.38	62.51	−1.87	61.4%
	Mental illness—Closed regime	0.69	45.06	50.03	21.07	22.33	2.98	75.35	132.17	56.82	66.4%
	Mental illness—High care	0.67	43.6	48.41	21.07	22.33	2.91	73.66	75.96	2.30	65.7%
	Mental illness—Low care	0.64	40.5	44.97	21.07	22.33	2.77	70.08	66.07	−4.01	64.2%
	Mental illness—Psychogeriatrics	0.66	44.5	49.41	21.07	22.33	2.96	74.70	77.17	2.47	66.1%
	Basic attention—Physical disability	0.42	26.64	29.58	21.07	22.33	2.12	54.04	62.63	8.58	54.7%
	Basic attention—Intellectual disability	0.33	20.91	23.22	21.07	22.33	1.86	47.41	50.67	3.26	49.0%
	Basic attention—Mental illness	0.33	20.91	23.22	21.07	22.33	1.86	47.41	50.67	3.26	49.0%
Day care	Elderly 7 days/week	0.32	19.11	21.22	9.98	10.58	1.32	33.11	37.97	4.86	64.1%
	Elderly 5 days/week	0.23	18.63	20.69	9.98	10.58	1.29	32.56	37.97	5.41	63.5%
	Physical disability	0.39	35.73	39.67	6.91	7.32	1.95	48.95	65.76	16.81	81.0%
	Intellectual disability	0.35	32.76	36.38	6.91	7.32	1.81	45.52	52.70	7.19	79.9%
	Occupational	0.19	19.27	21.40	6.91	7.32	1.19	29.91	32.45	2.54	71.5%
	Psychosocial rehabilitation center	0.19	20.97	23.29	6.91	7.32	1.27	31.88	32.45	0.58	73.0%

5. Discussion and Conclusions

This paper has established the main costs that should be taken into account when considering residential and day care for elderly and disabled people. In fact, 13 different costs have been considered for each type of centre.

We have also found differences in the cost per user when we distinguish different types of dependent persons (elderly or disabled) in the different types of care centres, considering the 16 types of centres recognised in the regulation.

Also, we have observed that in most types of centres, public prices paid by the regional government cover the costs of attending dependent persons, but there are specific centres where the public price is not enough to cover the costs.

In particular, the results show that the daily cost per user for elderly residential care is €53.72 (€3.75 below the price paid by the administration—public price).

The result obtained for Cantabria is in the range observed in previous studies, between 28.02 and 70.89 euros per user and per day. Reference [12] estimates an average cost of 53 euros per day, similar to the results obtained in [13], which estimated a daily cost of €54.75, and [16], which calculated a cost of €56.39. Reference [11], which analysed eight residences, establishes costs ranging from 28.02 euros/user/day for one centre to 61.63 euros/user/day for another, establishing an average value of around 46.66 euros. Reference [27] obtained a cost of 62.34 euros per day, and the highest cost is obtained by [17], achieving 70.89 euros.

The cost per user in elderly day centres (5 days) is 32.56 euros, which is lower than the value obtained by [13] of 41.86 euros (excluding transport) and is €5.41 below the public price.

In residential centres for people with disabilities, the values range between €47.41 and €75.25, depending on the category of the centre. It should be highlighted that in three categories of centres, the public price is not enough to cover the cost (physical disability, intellectual disability, mental illness—low care); therefore, the administration should reconsider their public prices for these kinds of centres if they want to really contribute to the sustainability of residential care centres. However, the costs obtained for Cantabria (Spain) are lower than the average costs of mild, moderate, and severe dementia found for the UK, which are £66.85, £75.06, and £126.16, respectively, per person per day [28].

In day care centres for people with disabilities, the values range from €29.91 to €48.95, and in all the categories of centres, the public price is enough to cover the costs.

In addition, it has become clear that staff costs are the most important cost for care centres, representing between 49% and 81% of total costs, depending on the category of the centre.

In conclusion, the complexity and diversity within the long-term care sector highlight the need to collect information directly from the centres so that the analysis of costs can be adjusted to the reality of the sector. However, each company has its own particularities that lead to having different values of costs for the same item. This paper has contributed by offering a single cost model for each type of centre, establishing standards for quantifying the human and material resources used in the development of the activity. Otherwise, it would not be possible to establish policies about public prices for each type of centre.

The results have revealed a deficit between the public price and the costs assumed in some types of centres (in 3 out of the 16 types of centres analysed), such as residential care for physical disability, for intellectual disability, and for mental illness—low care.

The price that the Government pays to residential and day care centres for elderly and disabled people will be key for the sustainability of long-term care and to cover the number of dependent people expected in Spain and, in particular, in Cantabria.

In any case, the results of the estimation of costs proposed in this study should not be considered static and unique, as their values will depend, among other factors, on the evolution of inflation and the staffing ratios required in the sector at any given time, which would lead to recalculation of the values.

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