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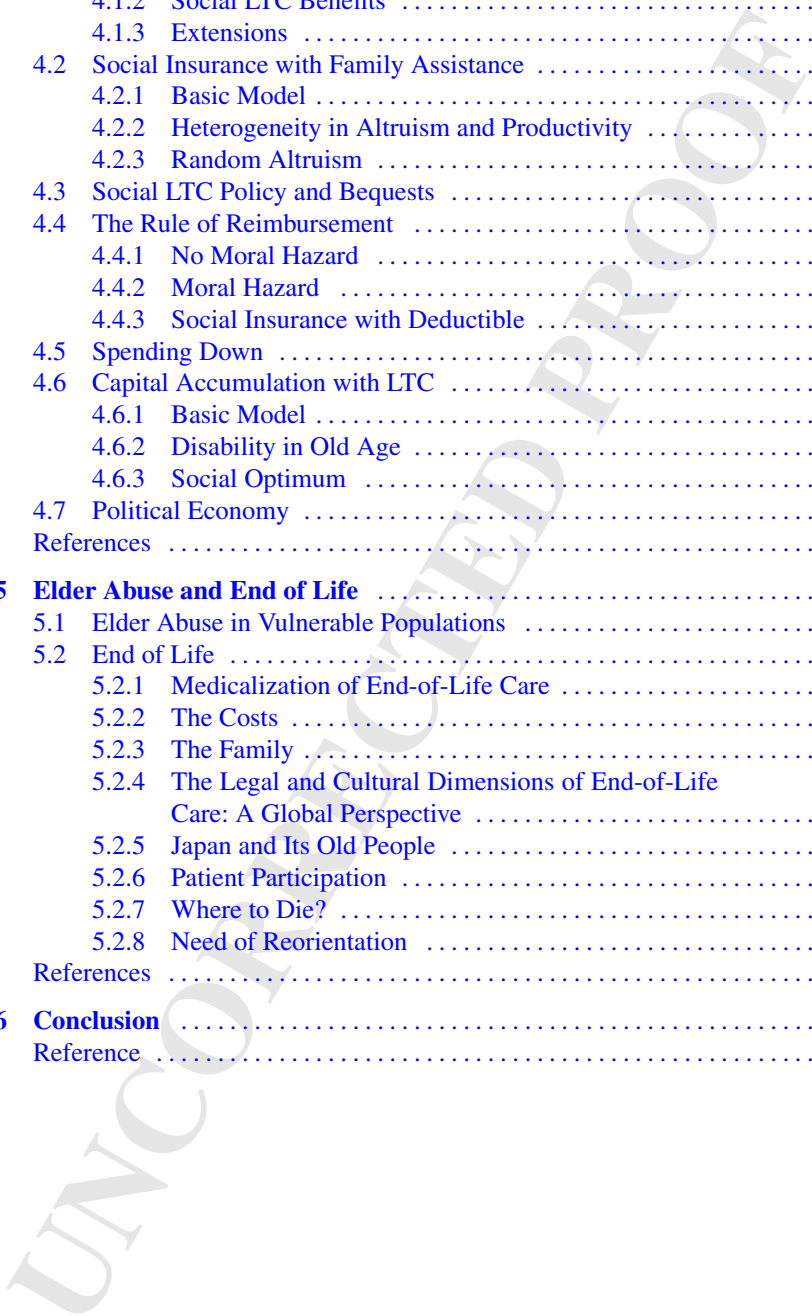
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Abstract	<p>The aging of populations worldwide has significant implications for the provision of old-age long-term care (LTC). As the proportion of elderly individuals increases, several key areas are particularly affected. First of all, there is an increased demand for LTC services. An aging population leads to a higher prevalence of age-related health conditions such as dementia, arthritis, and mobility issues, which in turn increases the demand for long-term care services. This includes both in-home care services and residential care facilities.</p>	

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# Chapter 1

## Introduction



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0 The aging of populations worldwide has significant implications for the provision of  
1 old-age long-term care (LTC).<sup>1</sup> As the proportion of elderly individuals increases,  
2 several key areas are particularly affected. First of all, there is an increased demand for  
3 LTC services. An aging population leads to a higher prevalence of age-related health  
4 conditions such as dementia, arthritis, and mobility issues, which in turn increases  
5 the demand for long-term care services. This includes both in-home care services  
6 and residential care facilities.

7 Secondly, the demand for healthcare professionals, including nurses, caregivers,  
8 and support staff specializing in geriatric care, is expected to rise. There might be  
9 shortages in the workforce if fewer younger people are available to replace retir-  
10 ing workers or to meet increasing demands. A solution may rest on technological  
11 innovations. There may be a push toward more technological solutions to help man-  
12 age the care of older adults more efficiently. Innovations like telemedicine, remote  
13 monitoring, and assistive technologies could play significant roles in addressing the  
14 growing need while also potentially reducing costs.

15 Thirdly, with more people requiring long-term care, there will likely be increased  
16 financial pressure on both public and private healthcare systems. Funding these  
17 services through insurance, out-of-pocket payments, or tax-funded systems could  
18 require new financial strategies or reforms. Governments and organizations may  
19 need to develop and adapt policies that support the aging population. This could  
20 involve changes in housing policies, the development of age-friendly communities,  
21 and increased support for family caregivers.

22 Fourthly, the family that has been the main provider of LTC services may have to  
23 adapt in this new setting where the ratio of those demanding needs to those able to  
24 fulfill them is increasing. The social fabric of communities may also change. There

---

<sup>1</sup> This book focuses specifically on long-term care services for older adults. It does not address the substantial population of children and adults who require long-term care for mental and physical health reasons.

25 could be a greater need for community-based programs and services that support not  
26 only the physical health of older adults but also their mental and social well-being.

27 Addressing the implications of an aging population on long-term care will require  
28 comprehensive strategies that integrate the market, the state and the family to ensure  
29 that the needs of older adults are met effectively and compassionately. Each plays a  
30 distinct and crucial role, often complementing each other to ensure that the needs of  
31 elderly individuals are met effectively.<sup>2</sup>

32 The state<sup>3</sup> plays a foundational role in the provision of long-term care through  
33 regulation, funding, and direct service provision. The state provides financial support  
34 for care through programs such as Medicaid in the U.S., or national health services  
35 in most countries. This can help cover costs of nursing homes, home health care,  
36 and other necessary services. In some cases, the government may also provide care  
37 services directly through public nursing home or implement policies that support  
38 family caregivers, such as tax benefits or paid leave policies. Another important  
39 mission of the state is to establish standards and regulations to ensure the quality  
40 and safety of care. Avoiding abuse both in institutions or at home is increasingly  
41 necessary.

42 Families often provide a significant portion, indeed the most important, of long-  
43 term care, either directly or by arranging and supervising care. Their role includes  
44 direct caregiving and emotional support. Many families take on the role of caregivers,  
45 providing daily assistance with activities such as bathing, feeding, and medication  
46 management. Beyond physical care, families contribute to the emotional well-being  
47 of their elderly members by maintaining close relationships and social connections.

48 Private sector involvement is crucial, especially where state and family provisions  
49 are inadequate. The market's role includes private insurance, offering long-term  
50 care package that helps cover the costs of care that state programs might not fully  
51 cover. It also provides private care through nursing homes, assisted living facilities,  
52 and home health care services. One also has to rely on the market for innovation  
53 and development. The private sector drives innovation in eldercare, including the  
54 development of new technologies and care models that can improve the quality and  
55 efficiency of care.

56 The interaction between the state, the family, and the market can vary greatly  
57 depending on the country's social policies, cultural norms, and economic condi-  
58 tions. Challenges in this system can include significant disparities in the availability  
59 and quality of care based on geographic, economic, and social factors. Financial  
60 resources, family altruism, and severity of the disability vary quite a lot from one  
61 elderly to another. In sum, a balanced approach that leverages the strengths of the  
62 state, the family, and the market, while addressing their limitations, is crucial for  
63 providing comprehensive and humane care to the elderly. This balance is dynamic  
64 and requires ongoing adjustments to respond to demographic changes and advances  
65 in healthcare.

---

<sup>2</sup> For earlier and shorter surveys, see Norton (2016) and Klimaviciute and Pestieau (2020, 2021).

<sup>3</sup> State here refers to the government.

66 In this work, we challenge certain commonly held beliefs, particularly the notion  
67 that family support is always altruistic and benevolent. We will indicate that much of  
68 the care provided by family members, including children and spouses, is rooted not  
69 in altruism but in familial and cultural norms. More critically, we will address the  
70 issue of mistreatment, which can be institutional but also familial. Such behaviors are  
71 especially harmful because the victims are often in a state of extreme vulnerability.

72 This book focuses specifically on OECD member countries, with particular  
73 emphasis on European societies. The evidence presented draws primarily from  
74 SHARE (Survey of Health, Ageing and Retirement in Europe), which provides  
75 comprehensive data on aging populations across the continent. It is structured as  
76 follows. After an introductory chapter, Chapter 2 examines aging and disability in  
77 old age, both across countries and over time. Chapter 3 focuses on the key institutions  
78 responsible for long-term care: the state, the market, and the family. It explores why  
79 the insurance market remains almost invisible and why care provided by children  
80 and spouses is becoming increasingly unreliable. While the book is largely non-  
81 technical, Chapter 4 introduces several analytical models that illustrate how the State  
82 could address long-term care needs in conjunction with the market, when available,  
83 and the family. Chapter 5 tackles two particularly sensitive topics: elder abuse and  
84 end-of-life care. The book concludes with a final chapter summarizing key insights.

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Abstract	The demand for long-term care in advanced countries is rising, driven by demographic shifts, including aging populations, increasing life expectancy, and changes in family structures. We now present evidence supporting this trend.	

---

# Chapter 2

## Some Evidence



### 2.1 Increasing Demand for LTC

The demand for long-term care in advanced countries is rising, driven by demographic shifts, including aging populations, increasing life expectancy, and changes in family structures. We now present evidence supporting this trend.

#### 2.1.1 Aging Population

The old-age dependency<sup>1</sup> ratio in OECD countries has risen significantly over the past 70 years and is expected to continue increasing in the coming decades. As a reminder, old-age dependency ratio is the number of individuals aged 65 or older per 100 people of working age, defined as those aged between 20 and 64 years old. Projections are drawn from the United Nations, *World Population Prospects 2022*. Table 2.1 presents some evidence for a sample of countries, the European Union (EU) and the OECD.

Currently, there are 31 individuals aged 65 and over for every 100 people of working age (20–64) on average across these OECD countries, compared to only 20 thirty years ago and 14 seventy years ago. The trend of population aging is accelerating, as this ratio—calculated with constant age thresholds—is projected to reach 66 within the next 70 years. However, the progression of old-age dependency ratios varies substantially across countries. Japan, the demographically oldest OECD country, currently has an old-age dependency ratio of 55.4%. Finland and Italy also have elevated ratios, both exceeding 40%. By 2052, Greece (70.7%), Italy (78.1%),

<sup>1</sup> Old age dependency has two different meanings. Either it refers to the ratio of elderly people (typically those aged 65 and over) to the working-age population (usually defined as ages 15–64) or, in the context of disability, it refers to the loss of functional independence that can occur as people age, resulting in the need for assistance with daily activities and self-care.

**Table 2.1** Old age dependency ratios

	1952	1992	2022	2082
France	19.7	24.9	39.3	68.4
Germany	16.9	23.7	36.0	64.8
Italy	14.8	25.4	41.0	83.4
Spain	13.0	24.3	33.4	84.7
Japan	9.9	21.6	55.4	85.7
UK	18.3	26.9	33.2	63.6
USA	14.9	21.0	29.4	58.7
OECD	13.8	20.4	31.3	66.1
EU27*	14.8	22.3	34.6	66.7

OECD (2023a)

\*EU27 refers to the 27 European Union member states after the UK left the EU.

**Table 2.2** Fertility rates

	1962	1982	2022	2062
France	2.77	1.92	1.70	1.76
Germany	2.50	1.49	1.59	1.59
Italy	2.40	1.56	1.29	1.47
Spain	2.70	1.93	1.29	1.47
Japan	1.99	1.70	1.31	1.50
UK	2.89	1.77	1.57	1.66
USA	3.34	1.82	1.66	1.70
OECD	3.30	2.15	1.59	1.63
EU27	2.50	1.93	1.53	1.62

OECD (2023a)

20 Japan (80.0%), Korea (82.3%), and Spain (77.2%) are expected to see their ratios  
 21 surpass 70%. In fact, by 2082, Korea's ratio could reach an extraordinary 117%.

22 While the rise in the population aged 65 and over has been notable across OECD  
 23 countries, the growth has been particularly sharp among the oldest cohort—those  
 24 aged 80 and above. By 2050, the share of people aged 80 and older is projected  
 25 to more than double on average in OECD countries. In nearly half (17) of OECD  
 26 countries, at least 1 in 10 people will be 80 or older by 2050. In six countries—  
 27 Lithuania, Portugal, Italy, Greece, Korea, and Japan—more than one in eight will  
 28 be 80 or older. This demographic shift is particularly significant as long-term care  
 29 needs are most pronounced among those aged 80 and above.

30 Declining fertility and increased longevity explain these trends. As it appears on  
 31 Table 2.2, fertility rates currently average 1.59 across OECD countries, well below  
 32 the level that ensures population replacement. The trend to fewer children started  
 33 in the late 1950s. The average fertility rate across OECD countries has stabilized  
 34 close to 1.6 over the last two decades and is projected to remain at this level in the

**Table 2.3** Life expectancy at age 65 in 2022 and 2065

	Women		Men		Difference*	
	2022	2065	2022	2065	2022	2065
France	88.7	92.6	85.0	89.0	3.7	3.6
Germany	86.2	90.9	82.9	88.4	3.4	2.5
Italy	88.0	92.2	85.0	99.2	3.0	3.0
Spain	88.6	92.7	84.7	88.8	3.8	3.9
Japan	89.9	94.1	85.1	89.1	4.8	5.0
UK	86.7	90.2	84.5	87.4	2.2	2.8
USA	88.9	90.1	83.1	88.4	2.8	1.7
OECD	86.2	90.6	83.0	87.9	3.2	2.7
EU27	85.6	90.2	82.2	87.4	3.4	2.8

OECD (2023a)

\*Difference between life expectancy of women and men

35 future. In the EU, the fertility rate is even lower with 1.53 in 2022. Here also there  
 36 is a large variety of situations with 1.80 in France and 1.30 in Spain and Italy. The  
 37 lowest fertility is in Korea with a rate of 0.87.

38 The remarkable increase in life expectancy is one of the greatest achievements of  
 39 the last century. Lives continue to get longer, and this trend is predicted to continue  
 40 although the pace of improvement in old age has slowed recently, and particularly  
 41 given COVID-19. As shown in Table 2.3, in 2022, life expectancy at age 65 averaged  
 42 83 years for men and 86.2 years for women. The figure was highest for women in  
 43 Japan (89.9 years) and men in Australia, New Zealand, and Switzerland (at 85.3  
 44 years or more) and lowest for women in Hungary and the Slovak Republic (below  
 45 83 years) and men in Lithuania (78.1 years). On average across OECD countries,  
 46 remaining life expectancy at age 65 is projected to increase by 4.4 years among  
 47 women and 4.9 years among men by 2065. The gender gap in life expectancy at age  
 48 65 is predicted to be between almost two and four years in favor of women in nearly  
 49 all OECD countries in 2065.

50 Note that we here use period life expectancy figures and not cohort life expectancy.  
 51 Those two concepts provide different perspectives on how long people live. Period  
 52 life expectancy reflects mortality rates of a specific time period, while cohort life  
 53 expectancy considers projected mortality improvements for a specific birth cohort  
 54 over their lifetime. In essence, period life expectancy is a snapshot of a moment, while  
 55 cohort life expectancy is a projection of a group's lifespan. Period life expectancies  
 56 tend to be lower than cohort life expectancies.

57 Aging populations are more prone to chronic conditions leading to a more or  
 58 less high loss of autonomy. In 2021, the greatest burden of disability among older  
 59 people in the EU stemmed primarily from dementias—including Alzheimer's dis-  
 60 ease, Parkinson's disease, and falls. Other significant causes of healthy life years  
 61 lost due to disability included diabetes, arthritis, depression and anxiety, as well as  
 62 cerebrovascular and ischemic heart diseases. As the population ages, Alzheimer's

disease and other dementias stand out as one of the most pressing challenges in EU countries. Despite extensive research and substantial financial investments, there is still no cure for these conditions, and existing treatments can at best slow their progression while potentially causing side effects that negatively impact quality of life. This underscores the urgent need to prioritize preventive measures.

In 2021, it was estimated that nearly 8 million people across EU countries were living with Alzheimer’s disease or another form of dementia. Among individuals aged 70 and over, more than 9% were affected, with prevalence rising sharply with age—from 3% among those aged 70-74 to 18% for individuals over 80. These figures highlight the growing burden of dementia as Europe’s population continues to age. Falls also pose a significant risk for older adults, often resulting in emergency department visits, hospital admissions, and long-lasting effects on mobility and quality of life. Several factors contribute to this increased risk, including a decline in muscle strength and balance, reduced physical activity, impaired vision, multiple medications, and malnutrition. Poor living conditions and inadequate home lighting further increase the likelihood of falls. According to data from the Survey of Health, Aging and Retirement in Europe (SHARE), the proportion of older people affected by falls rises markedly with age, and the gender gap becomes more apparent among the elderly. In 2021–2022, nearly one in six (16%) individuals aged 75 and older reported experiencing a fall within the previous 6 months across EU countries, with the rate being notably higher among women (18%).

**2.1.2 Changing Family Structures**

Declining birth rates across Europe have resulted in smaller family units. As a result, there are fewer family members available to provide informal care for the elderly. This shift is placing more pressure on formal long-term care systems. Increased urbanization and migration patterns have led to family members living further apart, making it difficult for families to care for their elderly relatives. This trend has further fueled the demand for formal LTC services. The evolution of family structures is increasingly shaped by the growing uncertainty faced by disabled parents regarding the care and support they can expect from their relatives. Various life events—such as the loss of a family member, serious illness, migration, economic struggles, or interpersonal conflicts—can unexpectedly disrupt these support systems. As a result, the reliability of family-based assistance becomes less predictable, reinforcing the need for alternative mechanisms to ensure adequate care and stability.

Death of caregivers creates an immediate and often permanent gap in support. When an adult child or spouse who provides daily assistance passes away, the disabled parent may be left without their primary caregiver and emotional support. Illness can affect both the caregiver and the disabled parent. A previously healthy family member might develop their own health issues, limiting their ability to provide care. Alternatively, the disabled parent’s condition might worsen, requiring more specialized care than family members can provide. Migration for employment, education,

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104 or personal reasons can physically separate caregivers from those who need care.  
105 When adult children move to different cities or countries for better opportunities, the  
106 geographic distance makes daily assistance impossible.

107 Economic hardship can force family caregivers to work longer hours or take mul-  
108 tiple jobs, reducing their availability. Financial stress might also mean families can  
109 no longer afford to subsidize the disabled parent's care needs or living arrangements.  
110 Family disputes and relationship breakdowns can sever caregiving arrangements.  
111 Disagreements about care responsibilities, inheritance issues, or longstanding fam-  
112 ily tensions might lead to the withdrawal of support from previously reliable family  
113 members. These disruptions often create cascading effects, where disabled parents  
114 must quickly find alternative care arrangements, potentially face institutional care, or  
115 struggle with unmet needs. The emotional impact can be significant as well, adding  
116 psychological stress to physical challenges.

### 117 **2.1.3 Forecasting Future Demand**

118 A recent European Commission study by Belmonte et al. (2023) presents a prototype  
119 microsimulation demographic model<sup>2</sup> projecting the risk of developing long-term  
120 care demand for the over-50 population in 19 selected European countries from 2011  
121 to 2070. Using data from SHARE, the study indicates a persistent trend of increasing  
122 long-term care demand and chronic diseases, primarily due to demographic aging.  
123 According to the baseline scenario, the prevalence of LTC demand is expected to rise  
124 from 11.6% in 2020 to 14.1% in 2070, representing a 21% increase from 2020 levels.  
125 In absolute terms, the number of people with LTC needs in the 19 EU countries is  
126 projected to grow from 19.7 million in 2020 to 20.9 million in 2025, 27.1 million in  
127 2050, and 28.7 million in 2070. In a scenario in which improving education levels do  
128 not translate into increased autonomy, the prevalence of LTC demand in 2070 would  
129 increase by 43% compared to 21% in the baseline scenario.

### 130 **2.1.4 Increased Public LTC**

131 Governments are recognizing the growing need for long-term care and are increasing  
132 their spending on LTC services. For example, the European Commission's Ageing  
133 Report (EC, 2024) projects that public spending on long-term care in the EU will  
134 increase from 1.7% of GDP in 2022 to 2.6% by 2070, reflecting the growing demand.  
135 This projection applies to the baseline scenario. This is equivalent to an increase of  
136 expenditure by 48%. The variation in the projected expenditures in % of GDP ranges  
137 from a stable overall pattern in Greece to increases above 100% in Spain and Denmark  
138 as it appears on Table 2.4. One also observes a variation in the generosity of public

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<sup>2</sup> See also Marois and Aktas (2021).

**Table 2.4** Public expenditures on LTC (% of GDP 2022–2070)

	2022	2070	% change
France	1.9	2.6	38
Germany	1.9	2.3	25
Italy	1.6	2.1	31
Spain	0.8	1.7	108
Denmark	3.0	6.2	109
Netherlands	3.8	5.7	48
EU27	1.7	2.6	47

EC (2024)

139 programs. The Netherlands devote 3.8 % of their GDP to LTC whereas Spain devotes  
140 only 0.8%.

141 In an interesting paper, Costa-font et al. (2015) examine the financing of LTC,  
142 distinguishing between ex ante (before the need arises) and ex post (after the need  
143 arises) mechanisms. The study suggests that ex ante and ex post mechanisms are  
144 largely substitutes, meaning that the extent to which one is used can influence the  
145 need for the other. Additionally, it appears that public LTC spending is significantly  
146 affected by a country's income, the proportion of elderly citizens, and the extent of  
147 informal care.

### 148 2.1.5 LTC Workforce Shortage

149 The increasing demand for long-term care services is also leading to workforce short-  
150 age in the LTC sector. This subsection focuses on paid caretakers, not unpaid care-  
151 givers such as family members, who may also be unavailable for reasons discussed  
152 above. The shortage of caretakers in nursing homes is a complex issue stemming  
153 from several interrelated factors. Understanding these causes and exploring poten-  
154 tial solutions can help address the problem effectively. There are several factors  
155 explaining this shortage. the main ones are low wages and benefits, high physical  
156 and emotional demands, lack of training and advancement opportunities, and public  
157 perception. Caretaker roles are often low-paying, with limited benefits. This discour-  
158 ages individuals from pursuing or staying in these positions. The work is physically  
159 taxing, emotionally challenging, and sometimes involves irregular hours. These fac-  
160 tors lead to burnout and high turnover rates. Limited access to training programs  
161 and career progression makes the role less attractive to potential employees. Finally,  
162 caretaking is often undervalued in society, which can deter people from entering the  
163 field. To address the shortage of caregivers, several comprehensive solutions can be  
164 implemented. Offering competitive salaries and comprehensive benefits packages is  
165 a critical step toward attracting and retaining workers in the caregiving sector.

166 In addition, providing hazard pay or bonuses for roles involving significant chal-  
167 lenges can serve as an effective incentive. Improving working conditions is equally  
168 essential, which can be achieved by establishing manageable caregiver-to-patient  
169 ratios to alleviate excessive workloads and by investing in supportive technologies  
170 designed to streamline caregiving tasks. Furthermore, ensuring the accessibility and  
171 affordability of training programs, including certifications and on-the-job learning  
172 opportunities, is crucial for equipping caregivers with the necessary skills. Clear path-  
173 ways for professional growth, such as progression into nursing or management roles,  
174 should also be developed to enhance career prospects within the field. In many coun-  
175 tries, caregiving is predominantly undertaken by immigrants, a trend that is expected  
176 to persist due to declining fertility rates. This demographic reality underscores the  
177 need for policies that support and integrate immigrant caregivers into the workforce  
178 effectively. Finally, public awareness initiatives play a vital role in addressing the  
179 caregiver shortage.

180 Promoting the importance of caregiving through targeted campaigns and commu-  
181 nity programs can help elevate the profession's reputation and encourage broader par-  
182 ticipation. Collectively, these strategies form a multifaceted approach to resolving the  
183 challenges associated with the caregiving workforce shortage. As it is clear, address-  
184 ing the caretaker shortage requires a multifaceted approach involving increased  
185 investment, societal change, and policy reform. By improving conditions, offering  
186 incentives, and leveraging technology, we can make caregiving a sustainable and  
187 rewarding career. In Europe, the shortage of carers in the long-term care sector has  
188 become a pressing issue due to the decline in the workforce available for such roles.  
189 One clearly would need a real political will to face those problems.

190 Migrant care workers are increasingly seen as a potential solution to this chal-  
191 lenge. Their involvement in the sector addresses a critical gap, as many European  
192 countries struggle to meet the rising demand for long-term care services. Migrant  
193 workers bring a unique value to the care industry, as they often possess the skills  
194 and willingness to take on roles that are sometimes viewed as less desirable by  
195 local workers. These jobs are often characterized by long hours, demanding physical  
196 and emotional responsibilities, and comparatively low wages. For many migrants,  
197 however, such roles offer an entry point into the labor market, providing financial  
198 stability and opportunities to integrate into their host societies. While the potential for  
199 migrant workers to mitigate the care crisis is evident, their integration into the work-  
200 force is not without challenges. Legal and administrative barriers, such as restrictive  
201 immigration policies and lengthy work visa processes, can hinder the recruitment of  
202 qualified caregivers from abroad. Cultural and language barriers also may also play a  
203 significant role. At the same time, these differences can sometimes be an advantage.

204 Migrant workers from southern regions bring distinctive cultural strengths to elder  
205 care, particularly their deep-rooted traditions of patience and empathy toward older  
206 adults. These values stem from societies where reverence for elders remains central  
207 to social fabric—a stark contrast to many Western contexts where aging populations  
208 face increasing marginalization amid youth-oriented cultural priorities. This cultural  
209 alignment positions migrant care workers as a vital resource for addressing Europe's  
210 mounting long-term care crisis. However, realizing this potential demands com-

211 prehensive integration strategies that harmonize the needs of care workers, elderly  
212 recipients, and the communities they serve. Success will require policies that rec-  
213 ognize both the unique contributions these workers bring and the structural support  
214 necessary for sustainable, dignified care systems. With the right measures in place,  
215 they can play a crucial role in alleviating the care shortage while enriching the cultural  
216 and social fabric of their host communities.

## 217 2.2 Disability-Free Life Expectancy

218 To assess the growth of LTC needs, a natural measure is the disability-free life  
219 expectancy (or “healthy life-years”), which is defined as the number of years spent  
220 free of activity limitation. In Europe, this indicator is calculated annually by Euro-  
221 stat for European countries.<sup>3</sup> The disability measure is based on the global activity  
222 limitation indicator (GALI) question in the EU-SILC survey: “For at least the past  
223 6 months, have you been hampered because of a health problem in activities people  
224 usually do? Yes, strongly limited / yes, limited / no, not limited.” In the EU, the num-  
225 ber of healthy life years at birth in 2022 was 62.8 years for women and 62.4 years for  
226 men, a gender gap of 0.4 years. Life expectancy in 2022 was 83.3 years for women  
227 and 77.9 years for men, a gap of 5.4 years. As the gender gap was considerably  
228 smaller in terms of healthy life years than it was for overall life expectancy, most of  
229 the additional years of life expectancy for women tend to be lived with activity lim-  
230 itations. Therefore, men tended to spend a greater share (80.1%) of their somewhat  
231 shorter lives free from activity limitations than women (75.4%).

232 Across the EU countries, life expectancy at birth for women in 2022 ranged  
233 between 77.9 years in Bulgaria and 85.9 years in Spain; a difference of 8.0 years.  
234 A similar comparison for men shows that the lowest life expectancy in 2022 was  
235 recorded in Latvia at 69.4 years and the highest in Sweden 81.4 years; a range of  
236 12.0 years.

237 As such, there were considerably wider differences between EU countries in terms  
238 of healthy years, when compared with the overall differences in life expectancy. In  
239 2022, a woman born in Denmark could expect to live 54.4 years free from any activity  
240 limitation, compared with 70.3 for a woman in Malta; a range of 15.7 years. In 2022,  
241 a man born in Latvia could expect to live 53 years free from any activity limitation,  
242 compared with 70.1 for a man in Malta; a gap of 17.1.

243 The expected number of healthy life years at birth was higher for women than  
244 for men in 19 of the EU countries. The difference between genders was generally  
245 relatively small: there were 4 EU countries where the gap rose to more than 3.0 years  
246 in favor of women (Bulgaria, Lithuania, Slovenia, and Poland) and one where the  
247 gap rose to more than 3.0 years in favor of men (the Netherlands). Over the period  
248 2015–2022, the number of healthy years has hardly increased, much less than life  
249 expectancy.

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<sup>3</sup> EC (2025)

**Table 2.5** Life expectancy (LE) and alternative measures of healthy life expectancy (HLE)

Countries	Men				Women			
	LE	HLE GALI	HLE ADL	HLE CASP	LE	HLE GALI	HLE ADL	HLE CASP
Sweden	81.9	77.9	80.7	80	85	79.2	83.3	82.3
Germany	80.1	74.	78.1	77.2	84.4	76.3	81.2	80.8
France	81.3	76	79.5	77.7	86.7	79.9	83.8	81.1
Spain	81.4	79.2	79.2	73.9	86.5	82.9	81.9	76.6
Italy	81.9	77.1	79.9	69.4	86	78.6	82	73.1
Poland	76.5	70.5	74.3	71.1	82.7	74.6	78.9	73.7

Flawinne et al. (2024)

250 To assess future needs of LTC, it would be interesting to forecast the evolution  
 251 of disability free life expectancy. A recent study<sup>4</sup> covering 202 countries shows that  
 252 in industrialized/developed countries such as the USA, Canada, Japan, Germany,  
 253 France, United Kingdom, and Australia, the increase in HLE is not as substantial,  
 254 mostly falling in the intermediate or lower range, for both genders.

255 Flawinne et al. (2024) compare healthy life expectancy using three dependency  
 256 indicators. In addition to the previously mentioned GALI, they rely on a functional  
 257 indicator measuring the number of limitations in activities of daily living (ADL) and  
 258 a more subjective indicator focusing on quality of life (CASP for Control, Auton-  
 259 omy, Self-Realization and Pleasure). These measures come from the European sur-  
 260 vey SHARE (Survey of Health, Aging and Retirement in Europe). A disability is  
 261 determined when a person has at least two ADL limitations. Since the prevalence is  
 262 significantly higher for GALI than for ADL, healthy life expectancy calculated with  
 263 GALI is systematically lower, regardless of the country or age, than those based on  
 264 ADL, with the exception of Italian women. The results obtained with CASP vary  
 265 considerably, and in Italy and Spain, the estimated life expectancy is even lower than  
 266 with GALI (Table 2.5).

267 The most striking finding of this study is the weak correlation between the three  
 268 methods of defining disability. For example, individuals with high scores in Activities  
 269 of Daily Living (ADL) may score poorly on the CASP or GALI scales. In other  
 270 words, a person may experience multiple activity limitations and yet feel relatively  
 271 content, while an autonomous individual might report significant unhappiness. This  
 272 highlights the complex challenge of defining needs related to states of dependence.

273 These alternative HLE measures highlight a compelling tension in our approach.  
 274 Policy makers require standardized metrics like GALI that can effectively guide pub-  
 275 lic policy design and resource allocation. However, if our ultimate goal is maximizing  
 276 well-being among disabled elderly individuals, the CASP indicator—with its focus  
 277 on quality of life dimensions—may offer more meaningful insights for achieving  
 278 that objective.

<sup>4</sup> Cai et al. (2023).

279 Whereas Healthy Life Expectancy (HLE) measures the average number of years  
 280 a person can expect to live in good health, free from disability or disease, Disability-  
 281 Adjusted Life Years (DALYs) represent the total burden of disease by combining  
 282 years of life lost due to premature death and years lived with disability. These two  
 283 metrics incorporate the concept of living with disability or poor health, but they  
 284 measure different aspects of population health. In practical terms, interventions that  
 285 reduce DALYs in a population (like disease prevention programs) typically increase  
 286 HLE, and countries with lower DALY rates generally have higher HLE.

### 287 **2.3 The Triple Penalty: A Cycle of Poverty, Poor Health,** 288 **and Shortened Life**

289 Whatever the way disability is measured, everywhere, we witness the phenomenon  
 290 of a “triple penalty,” a concept that underscores a profound socioeconomic inequality,  
 291 where poverty amplifies the challenges of living a shorter life and enduring poorer  
 292 health for a more significant portion of that life. This phenomenon is a stark reminder  
 293 of how interconnected economic status, health, and longevity are. The triple penalty  
 294 is not just additive; it’s synergistic. First, poverty increases stress, which worsens  
 295 health, leading to higher mortality risks. Second, health problems reinforce poverty  
 296 by reducing income-generating potential, compounding financial hardship. Finally,  
 297 shorter life expectancy limits opportunities to escape poverty through long-term  
 298 strategies like education and career advancement.

299 The triple penalty is a stark indicator of systemic inequality, revealing that societal  
 300 interventions must target not just health or income alone but the interplay between  
 301 poverty, health, and longevity. Addressing it holistically is essential for fostering  
 302 equitable opportunities and improving overall well-being. Whereas there exists a  
 303 rich literature on the relation between longevity and income/wealth, there is little  
 304 work devoted to the correlation between disability in old age and socio-economic  
 305 status. The rich live longer than the poor, and since sources of dependency, such  
 306 as Alzheimer’s disease or chronic illnesses, are linked to old age, one might expect  
 307 dependency to increase with wealth. However, this is not the case. Recent studies  
 308 show that the poor experience dependency for longer periods than the rich. The  
 309 inverse relationship between wealth and dependency (or the fact that wealthier indi-  
 310 viduals are generally less dependent as they age) can be explained by a combination  
 311 of socio-economic, environmental, and health-related factors.

312 First, wealthy individuals have better access to preventive and curative health-  
 313 care, such as regular medical check-ups to detect and treat chronic diseases early, or  
 314 access to specialists and advanced treatments that reduce complications leading to  
 315 loss of autonomy. In contrast, lower-income populations often face financial barriers  
 316 to accessing these services, delaying treatment and increasing the risk of dependency.  
 317 Secondly, affluent individuals generally live in safer and more suitable environments.  
 318 Their homes are better equipped to prevent accidents (secured staircases, adapted

319 showers, etc.). They also benefit more from green spaces and infrastructures that  
320 promote regular physical activity, whereas less wealthy individuals often live in pre-  
321 carious or overcrowded housing, which increases the risk of falls or illnesses. Another  
322 reason is that wealthier individuals often lead healthier lifestyles: balanced diets with  
323 access to higher-quality food, regular physical activity that maintains their physical  
324 condition and delays mobility loss, and fewer risky behaviors such as smoking or  
325 excessive alcohol consumption. On the other hand, people in precarious situations are  
326 more exposed to lower-quality food (high in sugar and fats) and sedentary lifestyles  
327 due to a lack of resources or information. Moreover, individuals with higher educa-  
328 tion levels have a better understanding of preventive practices. Finally, and likely the  
329 most significant factor, wealthy individuals typically hold jobs that are less physi-  
330 cally demanding, reducing the likelihood of injuries and musculoskeletal disorders  
331 as they age. Meanwhile, workers from modest backgrounds are often exposed to  
332 strenuous working conditions, leading to accumulated health problems that increase  
333 the probability of dependency (osteoarthritis, chronic fatigue, etc.).

334 Among the few existing studies, we have Lefebvre et al. (2018), who analyze,  
335 using data from the Survey of Health, Ageing and Retirement in Europe (SHARE), the  
336 relationship between wealth, the subjective survival probability and the probability to  
337 become dependent among Europeans aged 50 and above. They find that individuals  
338 from the low end of the wealth distribution have a higher probability of becoming  
339 dependent and also that they remain dependent longer.

340 More recently, Connolly et al. (2024) using 2016 Canadian survey data on adults  
341 aged between 50 and 70 do find that income and the probability to live to age 85 are  
342 positively related while income and the probability to suffer from ADL limitations  
343 are negatively related. They also find that while the objective probability to enter  
344 a nursing home is negatively correlated with income, the subjective probability is  
345 positively correlated with income.

346 Finally, using HRS and SHARE data, Lefebvre et al. (2025) study the causal  
347 impact of the socio-economic status on disability in old age and its duration. They  
348 provide evidence that people with lower economic status are more likely to become  
349 disabled and once they are disabled, the duration of their loss of autonomy is higher  
350 than that of wealthier individuals.


351 Those results call for important policy recommendations. Poorer individuals are  
352 those who are more likely to become dependent and as such, more generous long-  
353 term care (LTC) public policies should primarily be targeted toward them. This  
354 would generate a double benefit: first, by reducing the expected cost of dependency  
355 for those who would have more difficulty to pay for LTC expenditures and second,  
356 by fostering redistribution and decreasing income inequalities across the elderly.  
357 Furthermore, we know that occupational health hazards often contribute to reduced  
358 life expectancy and lower quality of life for workers in harsh or physically demanding  
359 jobs. One could add that low-income earners tend to have high-risk jobs, including  
360 jobs in LTC. This should induce public authorities into regulating the labor market  
361 to prevent the costly and painful implications of harsh occupations.

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Chapter 2

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Abstract	<p>The market plays a significant role in providing long-term care for the elderly, encompassing a range of services and facilities designed to meet the health, social, and daily needs of individuals who have a reduced degree of self-sufficiency due to aging. Many long-term care facilities, such as nursing homes, assisted living communities, and home health care services, are operated by private companies.</p>	

# Chapter 3

## The Market, the State, and the Family



Author Proof

### 3.1 The Market

The market plays a significant role in providing long-term care for the elderly, encompassing a range of services and facilities designed to meet the health, social, and daily needs of individuals who have a reduced degree of self-sufficiency due to aging. Many long-term care facilities, such as nursing homes, assisted living communities, and home health care services, are operated by private companies. These businesses offer tailored care services that can often provide higher quality amenities and more personalized care compared to some public options, depending on the resources and regulations of a particular country.

Furthermore, the private sector often drives innovation in the field of elderly care. This includes the development of medical technologies, tele-health services, and assistive technologies designed to improve the quality of life for the elderly and increase the efficiency of care services. Innovations such as wearable health monitors, emergency alert systems, and AI-driven health management tools are examples of market contributions that enhance long-term care.

Finally, the market could play a crucial role by offering long-term care insurance products that can help cover the cost of care. These products are particularly significant as they provide financial planning tools that enable individuals to manage the potentially high costs associated with long-term care. The market for these insurance products varies widely across countries, influenced by factors such as demographic trends, cultural attitudes toward familial caregiving, and government policy. Overall, the insurance market does not play an important role in most countries. Here below, we focus on this aspect of the involvement of the market in LTC.

### 23 **3.1.1 The LTC Insurance Puzzle**

24 Probably, the most discussed issue when it comes to private LTC insurance is the  
 25 so-called LTC insurance puzzle,<sup>1</sup> namely the surprising lack of demand for this type  
 26 of insurance. Indeed, it is widely accepted that the need for LTC is an insurable risk.  
 27 It concerns the majority of individuals. It can be defined and measured. As a greater  
 28 number of elderly people will be living longer and face the risk of dependence in the  
 29 coming years, the benefits of insuring against this risk from a variety of perspectives,  
 30 including that of the disabled individual and his or her family caregiver, should be  
 31 compelling. And yet, in the USA, only 3% of LTC expenditures are funded by private  
 32 LTC insurance. Also, only about 7 million out of 86 million people aged 55 and over  
 33 have private LTC insurance (Nordman, 2016). Furthermore, the thinness of the LTC  
 34 insurance market is more prevailing in the other OECD member countries.<sup>2</sup>

35 How can we explain the lack of demand for an insurance that covers a risk to  
 36 which the majority of individuals are confronted? The usual reasons for such a weak  
 37 demand include adverse selection, moral hazard and the offer of public programs  
 38 that may crowd out private demand for coverage. To these explanations, we could  
 39 add a number of other factors: unattractive rules of reimbursement, state-dependent  
 40 preferences as well as behavioral biases and lack of information.

#### 41 **3.1.1.1 High Prices and Adverse Selection**

42 Research by Brown and Finkelstein (2007, 2008, 2009) reveals critical structural  
 43 challenges in the U.S. long-term care insurance market, centering on gender-based  
 44 pricing disparities and substantial loading factors that constrain market growth. Their  
 45 analysis demonstrates a paradoxical pricing dynamic: despite women receiving actu-  
 46 arially favorable rates—sometimes even negative loads that represent below-cost  
 47 pricing—they do not respond by purchasing more comprehensive coverage. This  
 48 counterintuitive pattern suggests that factors beyond price, such as information asym-  
 49 metries or behavioral barriers, fundamentally limit market participation. The load-  
 50 ing factor analysis exposes the market's inherent inefficiencies. These “loads”—  
 51 representing the gap between premiums collected and expected benefit payouts—  
 52 reach substantial levels when accounting for policy lapses. A 65-year-old male pur-  
 53 chaser faces a 44-cent load per premium dollar, effectively paying \$1.44 for every  
 54 dollar of expected benefits. Conversely, women may encounter negative loads, receiv-  
 55 ing more in expected value than they pay in premiums.

56 Sloan and Norton (1997) find that asymmetric information as to the probability of  
 57 turning disabled leads to adverse selection and explains part of these high prices. The  
 58 demand for LTC insurance depends on various observable factors associated with  
 59 age, health, and functional status as well as unobservable ones such as individuals'  
 60 subjective probability of future nursing home use. This probability rests in part on

<sup>1</sup> Pestieau and Ponthiere (2012).

<sup>2</sup> See, for example, OECD (2020).

61 the degree of aversion to being in a nursing home of the individuals and on their  
62 impressions about the availability of their families and friends to help them if they  
63 become severely dependent. This probability is private information. To the extent that  
64 the person's own knowledge about future use differs from the insurer's observation,  
65 there is the potential for adverse selection.

66 A number of authors (Brown and Warshawsky, 2013; De Donder et al., 2022;  
67 Murtaugh et al., 2001) argue in favor of integrating LTC insurance with life annuities.  
68 Such a combination of insurance against two negatively correlated risks (longevity  
69 and disability) would reduce the costs and the extent of adverse selection for both  
70 products since those in bad health are likely to face higher prices for LTC insurance  
71 but lower prices for annuities (due to their higher mortality) and vice versa. De  
72 Donder et al. (2022) show that this kind of bundling could even result in advantageous  
73 selection.<sup>3</sup>

#### 74 3.1.1.2 Moral Hazard

75 Pauly (1990) develops a particular type of moral hazard for private LTC insurance,  
76 the so-called intra-family moral hazard. Accordingly, elderly persons fear that if they  
77 purchase private insurance, children may tend to send them in nursing homes as soon  
78 as they are unable to act on their own. Insurance may indeed induce such a move  
79 as it reduces the cost of institutionalization relative to the cost of giving personal  
80 attention. Elderly persons who prefer informal care from their children over formal  
81 care may therefore choose not to purchase insurance. Zweifel and StrÅ¼we (1998)  
82 demonstrate that when parents purchase long-term care (LTC) insurance, it often  
83 reduces the amount of care provided by their primary caregivers, typically children  
84 who earn relatively low wages. Due to this moral hazard effect, parents are often  
85 predicted to forgo purchasing LTC insurance. See also Zweifel and Courbage (2016)  
86 and Klimaviciute (2017, 2019).

87 On the question of moral hazard, Trainar (2024) challenges the prevailing notion  
88 that dependence risk is readily insurable. He highlights the inherent ambiguity associ-  
89 ated with this type of risk. Consequently, contracts designed to mitigate dependence  
90 risk often display a fundamental asymmetry, thereby creating potential for moral  
91 hazard.

#### 92 3.1.1.3 Availability of Social Assistance

93 The availability of social assistance such as Medicaid in the USA may crowd out  
94 demand for private LTC insurance. Medicaid is designed to provide coverage only for  
95 the very poor. To qualify, one must have virtually no non-housing wealth. However,  
96 there is considerable evidence that to qualify for Medicaid, middle-class elderly

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<sup>3</sup> They define advantageous selection as the situation when a rise in the insurance premium induces high-cost individuals to leave the market, which decreases the average cost among those who remain.

97 persons become impoverished by spending all their wealth during a nursing home  
 98 stay, a process called spend-down. According to Wiener et al. (2013) who analyze  
 99 a population of elderly over the period 1996–2008, almost 10% of the previously  
 100 non-Medicaid population aged 50 and over spent down to Medicaid eligibility.<sup>4</sup>  
 101 There is further such a thing as “artificial self-impoverishment,” which involves  
 102 manipulating one’s income and assets so that an individual who would otherwise  
 103 not qualify for Medicaid LTC benefits can slip in below the financial eligibility  
 104 limits and qualify after all. One standard technique of such strategic impoverishment  
 105 consists in transferring one’s assets to relatives at less than fair market value for the  
 106 purpose of appearing artificially poor.<sup>5</sup> This being said, Kim (2018) has shown that  
 107 eliminating the Medicaid program increases LTC insurance holding by only 5.3%,<sup>6</sup>  
 108 which implies that the demand for LTC insurance would remain low even without  
 109 Medicaid. In the next chapter, we come back on this issue.<sup>7</sup>

#### 110 3.1.1.4 State-Dependent Preferences

111 A further explanation for the underdeveloped disability insurance market centers on  
 112 preference shifts that occur following disability. The argument suggests that indi-  
 113 viduals who become disabled experience a decline in the marginal utility of income,  
 114 which paradoxically reduces their demand for the very insurance that would have  
 115 protected them. This view is theoretically justified by assuming that disability makes  
 116 an individual less efficient in transforming income into utility.

117 De Donder and Leroux (2021) indicate that if old age disability decreases the  
 118 marginal utility of daily life consumption, then there is less need for insurance. As  
 119 they show, on the one hand, dependency creates additional expenses (LTC costs),  
 120 which calls for buying insurance, but, on the other hand, if daily life consumption  
 121 becomes less valuable when dependent, there is less incentive to transfer resources  
 122 to the bad state of nature, namely in case of disability. The individual’s decision of  
 123 whether to buy insurance depends on the relative size of the two effects, but even if  
 124 insurance is purchased, it is then optimal to insure less than fully.

125 To date, the empirical literature on state-dependent preferences in the context of  
 126 loss of autonomy has failed to reach a consensus. In part, this is due to specification  
 127 differences. On the one hand, Lillard and Weiss (1997) and Ameriks et al. (2020)  
 128 find that marginal utility is higher when dependent than when autonomous. On the  
 129 other hand, Finkelstein et al. (2013) and Koijen et al. (2016) obtain that the marginal  
 130 utility of consumption decreases in the case of poor health, which would explain the  
 131 LTC insurance puzzle.

132 Let us remember a basic principle of insurance: for a risk to be worth insuring,  
 133 the marginal utility of wealth should be higher in the loss state than in the no-loss

<sup>4</sup> We come back on this issue in the following chapter.

<sup>5</sup> See Wiener et al. (2017).

<sup>6</sup> The share of individuals in the sample having LTC insurance increases from 9.5 to 10%.

<sup>7</sup> See Norton (1995).

134 state, which creates a demand for insurance. In other words, people would buy a  
135 LTC insurance when the marginal utility of money is higher in bad states (in case of  
136 disability) than in good states (when fully autonomous).

### 137 3.1.1.5 Behavioral Biases and Lack of Information

138 Concepts from behavioral economics such as “loss aversion” (the idea that losses  
139 loom larger than gains) might make people reluctant to spend money on an insurance  
140 product that they hope never to use. Furthermore, the “optimism bias” (the belief  
141 that bad things are less likely to happen to oneself than to others) might lead people  
142 to underestimate their own need for future care. Also, psychological factors such  
143 as procrastination and present bias (a preference for immediate rewards over future  
144 benefits) also play a role. Purchasing long-term care insurance is easy to put off  
145 because the benefits are not immediate and are contingent upon an unpleasant future  
146 possibility—becoming severely dependent. Another reason why individuals tend to  
147 under-save for retirement and particularly for LTC may be lack of information and  
148 knowledge. Empirical studies such as Zhou-Richter et al. (2010) or Boyer et al. (2019,  
149 2019) document these effects. Finally, it can arise from present bias and self-control  
150 problems. Accordingly, individuals would have two selves, one concerned by instant  
151 gratification and another by long-term benefits and later well-being. When choosing  
152 how much to save, the first self would prevail. Clearly, those behavioral biases could  
153 be invoked to explain the low demand for LTC insurance. Cremer and Roeder (2013)  
154 and De Donder and Leroux (2013) show that these biases can affect the design of  
155 optimal LTC policies.

### 156 3.1.1.6 Denial of Severe Dependence

157 Many individuals underestimate the likelihood that they will need long-term care.  
158 This form of cognitive bias—where people believe that they are less likely to experience  
159 negative events compared to others—is widespread. The reality, however, is  
160 quite different. Studies suggest that about 70% of people turning age 65 can expect  
161 to use some form of long-term care during their lives. Denial or minimization of this  
162 fact can lead people to forego preparing for such eventualities. Kopchuk and Slemrod  
163 (2005) show that attempts to reduce death anxiety and the possibility of denial  
164 of mortality-relevant information interact with intertemporal choices and may lead  
165 to time-inconsistent behavior and other behavioral phenomena. Individuals seem to  
166 have the same denial attitude toward such an unpleasant occurrence as dementia or  
167 heavy and lasting disability in old age.

### 3.1.2 Unappealing Rules of Reimbursement

Long-term care insurance policies can be complex, and many people find it difficult to choose a suitable plan. The current formulas of benefit payments are unattractive. Two countries in which the LTC insurance market has been rather developed so far are the USA and France. In the USA, the formula of reimbursement tended to be the prevailing one up to recently. This formula is based on that used in health care insurance. However, now most companies offer policies of the cash indemnity type within a limited period. In France, the common formula is that of the lifetime cash indemnity. The rule of reimbursement of LTC insurance most used currently in the USA that provides benefits for a given period is unappealing as it does not cover cases where the disabled elderly lives beyond that period. Conditions like Alzheimer's disease, stroke, or other chronic illnesses can require care for many years, sometimes a decade or more. A person might exhaust their policy benefits while still needing extensive care. The lump-sum approach used in France tends to offer an insufficient coverage in case of heavy disability.

The relative desirability of those payment rules depends on the underlying assumptions. For instance, when family assistance is introduced, the flat lump-sum payment seems to be more efficient. See on this Cremer, Lozachmeur and Pestieau (2016) and Klimaviciute (2017). It remains that neither of the two formulas provides sufficient protection against the cost of a severe and long disability, which is not totally unlikely. Nordman (2016) indicates that 52% of individuals turning 65 will have high LTC needs over their remaining lifetimes. These needs are expected to last about 2 years on average, but they will last longer for 26% of individuals. This is especially relevant for women: 17.8% of them will have a period of 5 and more years of severe dependence as it appears on Table 3.1. Also, there seems to be a negative correlation between income and the length of LTC need. For instance, 22% of individuals in the highest income quintile will need LTC for more than 2 years, while the proportion goes up to 31% for those belonging to the lowest income quintile. In an earlier study, Brown and Finkelstein (2008) estimate that about one-third of 65-year olds will enter a nursing home. The length of the nursing home stay is mostly less than 12 months. They show however that 12women will spend more than 3 years at a nursing home. The financial cost for these stays is quite high. According to Genworth CareScout (2024), the 2024 national median monthly cost is \$5,900 for assisted living community, \$9,277 for a nursing home semi-private room, and \$10,646 for a Nursing home private room. These LTC costs increase faster than inflation.

**Table 3.1** Length of heavy dependence (USA, age 65+)

	% with LTC needs	None (% of cohort)	<2years	2–5 years	>5years
Men	46.7	55.3	25.8	11.1	9.8
Women	57.5	42.5	27.5	12.3	17.8

Nordman (2016)

203 To avoid the possibility for a fraction of dependents to spend down all their  
 204 resources and to be forced to rely on their children's aid or on social assistance such  
 205 as Medicaid, Drèze et al. (2016) and Klimaviciute and Pestieau (2018a, 2018b) argue  
 206 in favor of the deductible principle. Accordingly, the individuals would have to pay  
 207 part of the costs of dependence incurred during a certain number of months, and  
 208 beyond a certain threshold, all the costs would be covered. Inspired by the famous  
 209 theorem of the deductible by Arrow (1963), these authors show that such insurance  
 210 policy is efficient in the case of LTC.<sup>8</sup> Klimaviciute and Pestieau (2020) confirm  
 211 that the deductible formula for LTC remains relevant under ex post moral hazard as  
 212 well. Furthermore, Klimaviciute et al. (2020) find that the efficiency of the deductible  
 213 also holds in the presence of family solidarity, although some departures from the  
 214 standard results exist in those cases. We come back on these issues in a more formal  
 215 way in the next chapter.

216 All in all, the consequences of the ensuing thin LTC insurance market are twofold:  
 217 it puts further pressure on the family and on the government and it explains why sav-  
 218 ing is still increasing in old age, which leads to unexpected bequests in case parents  
 219 escape disability. See on this Ameriks et al. (2020). It appears clear that encourag-  
 220 ing more people to purchase long-term care insurance is desirable but requires both  
 221 education about the risks and potential costs of long-term care, as well as making  
 222 insurance products more accessible and understandable. Financial education cam-  
 223 paigns, simpler product offerings, and possibly government incentives or mandates  
 224 could help increase the uptake of long-term care insurance.

### 225 3.1.3 Home Ownership as a Surrogate for LTC Insurance

226 Acquiring a house is often regarded as one of the most effective strategies for ensur-  
 227 ing security and protection in the event of disability in old age.<sup>9</sup> This perspective  
 228 arises from the multifaceted benefits of homeownership, which extend beyond the  
 229 immediate utility of having a place to live. A house provides not only a physical  
 230 shelter but also a sense of stability and independence that is especially critical in  
 231 later years when physical or financial vulnerabilities may increase. One of the pri-  
 232 mary reasons a house is considered a safeguard against disability-related challenges  
 233 is its capacity to eliminate or significantly reduce housing costs in retirement. For  
 234 individuals who own their homes outright, the absence of rent or mortgage payments  
 235 means that a significant portion of their monthly expenses is alleviated. This financial  
 236 stability can make it easier to allocate resources toward healthcare, caregiving, and  
 237 other essential needs that may arise due to disability.

238 Furthermore, owning a house enables customization to suit the specific needs of  
 239 aging individuals. As physical abilities decline, homeowners can modify their living  
 240 spaces to enhance accessibility and comfort. Features such as wheelchair ramps,

<sup>8</sup> See Dilnot (2011).

<sup>9</sup> Achou (2021).

241 widened doorways, stairlifts, and grab bars can be installed without the constraints  
242 or permissions often required in rental properties. This adaptability ensures that  
243 the home remains a safe and functional environment, reducing the likelihood of  
244 accidents and supporting an individual's desire to age in place. It's important to  
245 recognize, though, that some of these investments carry significant expenses that  
246 remain uncovered by existing insurance schemes, whether public or private.

247 In addition to its practical advantages, a house often serves as a valuable financial  
248 asset. In cases where medical expenses or long-term care costs become overwhelm-  
249 ing, homeowners can tap into the equity built up in their property through options  
250 like reverse mortgages, home equity loans, or even selling the house if necessary.  
251 This financial cushion provides a critical safety net, helping to manage the unpre-  
252 dictability of old age and disability-related expenses. Homeownership also fosters a  
253 sense of community and belonging, which can be particularly beneficial for individ-  
254 uals with disabilities. Living in a familiar neighborhood often means having access  
255 to a support network of friends, family, and neighbors who can provide assistance or  
256 companionship when needed. This social dimension of owning a home contributes  
257 significantly to emotional well-being, which is equally important for maintaining a  
258 good quality of life in old age. In contrast, relying on rental housing in old age may  
259 introduce uncertainties, such as the potential for rising rents, eviction risks, or the  
260 inability to make necessary modifications to the property.

261 These factors can compound the challenges faced by individuals with disabili-  
262 ties, making homeownership a more appealing and secure option. Thus, acquiring a  
263 house stands out as a prudent and effective means of ensuring protection against the  
264 uncertainties of disability in old age. It combines financial security, adaptability, and  
265 social stability, providing a comprehensive solution that supports both physical and  
266 emotional well-being. This long-term investment not only safeguards against imme-  
267 diate challenges but also empowers individuals to face the future with confidence  
268 and dignity. Selling your home can provide a significant financial resource to fund  
269 your stay in a nursing home for several years. The proceeds from the sale of your  
270 home often convert a significant portion of your net worth into liquid assets, which  
271 can then be used to cover the monthly costs of long-term care. Given that nursing  
272 home expenses typically range in the USA between \$7,000 and \$10,000 per month,<sup>10</sup>  
273 depending on the location and level of care, the equity you've built in your home  
274 may be sufficient to support these expenses for an extended period. For those who  
275 are not ready to sell immediately, alternative options like renting out the property to  
276 generate a steady income stream or using a reverse mortgage to tap into the equity  
277 while retaining ownership may provide interim solutions. Emotional and practical  
278 considerations, such as attachment to the home or the need to store or distribute  
279 belongings, should also be factored into the decision-making process.

280 Finally, if there is a possibility that a nursing home stay could be temporary,  
281 selling the home might not be the most flexible solution, and short-term financing  
282 options might be worth exploring. A substantial body of literature, primarily from the

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<sup>10</sup> In European countries such as France and Germany, the costs are quite lower: between 4000 and 5000 euros.

283 USA, highlights the role of illiquid housing assets in financing long-term care and  
284 potentially substituting for long-term care insurance. Research indicates that retirees  
285 primarily deplete housing wealth when transitioning to LTC facilities. According to  
286 Davidoff (2010), older adults often hold significant wealth in home equity, which  
287 is rarely utilized before death unless they move into LTC facilities. The illiquid  
288 nature of home equity may discourage the purchase of private LTC insurance by  
289 serving dual functions. First, it provides a buffer of assets that can be liquidated to  
290 cover care costs if needed. Second, it increases the marginal utility of liquid wealth,  
291 which might otherwise be allocated to insurance premiums. Venti and Wise (2004)  
292 observe that, aside from public pensions, housing equity represents the principal asset  
293 for a large proportion of older Americans, many of whom have minimal financial  
294 assets to sustain retirement consumption. Homeownership can be a critical financial  
295 resource for meeting LTC needs, particularly through mechanisms like home-equity  
296 conversion or reverse mortgages. These options allow individuals to access the equity  
297 in their homes to cover LTC expenses, effectively serving as a substitute for traditional  
298 LTC insurance.

299 Chen (2001) extensively examines the use of home equity to support LTC, empha-  
300 sizing the potential of reverse mortgages to enhance financial security for older adults  
301 confronting care needs. Similarly, Hanewald et al. (2020) explore various strategies  
302 for unlocking housing wealth to fund LTC. Their analysis underscores the straight-  
303 forward approach of selling property and using the proceeds to cover LTC insurance  
304 premiums or direct care costs. However, they also highlight the challenges associated  
305 with this method, such as relocation requirements and the potential impact on family  
306 members. In conclusion, leveraging home equity through mechanisms like reverse  
307 mortgages offers a viable alternative or supplement to LTC insurance. This approach  
308 provides a flexible financial solution for addressing care needs in later life, thereby  
309 mitigating some of the limitations associated with traditional insurance options.

## 310 3.2 The Family

311 Since the dawn of time, the family has been the main provider of LTC in our societies.  
312 Much more than the state and surely more than the market. Yet, in spite of increasing  
313 needs, its role seems to be decreasing due to several interrelated factors, primarily  
314 driven by demographic, social, and economic changes. Following increased in life  
315 expectancy and declining fertility, most countries are experiencing aging popula-  
316 tions. This shift increases the demand for care, but the simultaneous decrease in birth  
317 rates means there are fewer family members available to provide that care. Tradi-  
318 tional family structures have evolved. There are more single-parent families, smaller  
319 families, and families where both adults work full-time, which can limit the ability  
320 of family members to provide extensive care. Additionally, the increase in divorce  
321 rates and remarriages can complicate familial obligations and responsibilities. There  
322 is a cultural shift in some societies toward individualism and self-reliance, which  
323 can decrease the perceived responsibility to care for elders within one's own fam-

ily. Moreover, societal attitudes toward professional eldercare facilities have become more favorable, making them a more acceptable option. These factors contribute to a decreasing reliance on family for eldercare, reshaping how societies care for their aging populations. This trend necessitates a reevaluation of policies and practices surrounding eldercare to address the needs of both the elderly and their families effectively.

### 3.2.1 Contribution of the Family to LTC

Despite demographic shifts and changing family structures, informal caregiving remains the backbone of long-term care (LTC) for elderly individuals, with family members providing an estimated 80% of all care hours. Spouses, partners, and adult children constitute the primary caregiving network, with women—particularly wives and daughters—shouldering a disproportionate share of these responsibilities. While this pattern is well-documented across cultures, collecting precise data on informal caregiving presents significant methodological challenges due to the private nature of care provision and variations in how caregiving activities are defined and reported. The measurement of family caregiving contributions requires a multidimensional framework that captures both tangible and intangible aspects of care. Key dimensions include time allocation (direct care hours and supervision), financial expenditures (out-of-pocket costs and lost wages), emotional labor (psychological support and stress management), and care quality indicators (safety, consistency, and appropriateness of care). Researchers employ mixed-method approaches to assess these components, combining quantitative tools such as time-use surveys and economic analyses with qualitative methods including in-depth interviews and observational studies. This comprehensive assessment typically incorporates perspectives from multiple stakeholders: family caregivers, care recipients, healthcare professionals, and social workers, providing a more complete picture of the caregiving landscape.

To assess the size of informal care provided by the family, one uses the same method that is employed to measure the contribution of household work to GDP. Admittedly, this is a complex task because traditional GDP only includes market transactions—activities that have a market price. Household work, such as cooking, cleaning, childcare, and eldercare, though economically significant, is generally unpaid and therefore not included in standard GDP calculations. However, there are methods and approaches economists use to estimate its value. They generally consist of two stages. First, they rely on Time Use Surveys (TUS) that collect data on how individuals allocate their time to various activities, including unpaid household work. These surveys provide insights into the amount of time spent on household tasks. Second, these methods estimate the value of household work by calculating how much it would cost to hire someone to perform the same tasks. It involves estimating the market wage rate for professionals providing similar services (e.g., housekeepers,

364 chefs, nannies) and then multiplying the time spent on each task by the corresponding  
365 wage rate.

366 For example, a study by McKinsey<sup>11</sup> estimated that unpaid work contributes  
367 around \$10 trillion annually to the global economy, representing nearly 13% of global  
368 GDP if it were included. Several studies have quantified the economic significance  
369 of informal care in the USA. Coe et al. (2018) estimated its value at \$277 billion in  
370 2011 alone. Building on this research, Coe and Werner (2022) examined informal  
371 caregiving within residential care facilities and nursing homes, demonstrating that  
372 its contribution remains substantial even in institutional settings. Van Houtven et al.  
373 (2013) provide additional evidence supporting the considerable economic impact of  
374 informal care arrangements.

375 In a recent study (EC, 2021), an evaluation of the significance of informal care  
376 in the EU is presented, measured as a percentage of GDP. The authors employ  
377 two approaches to estimate this value: the proxy-good method, which assigns a  
378 monetary value to informal caregivers' time based on the market price of professional  
379 substitutes for specific caregiving tasks, and the opportunity cost method, which  
380 values the time of informal caregivers based on the potential earnings or alternative  
381 uses of that time foregone.

382 Table 3.2 compares the value of informal long-term care provision in percentage  
383 of GDP. It is calculated using these two methods. Additionally, it includes the value  
384 of formal LTC expenditures as reported in the Ageing Report. Two key observations  
385 emerge from these figures. First, in most Member States, the value of informal care  
386 surpasses public LTC expenditures. Second, Southern European countries, including  
387 France, appear to benefit from substantial levels of informal care, despite (or because)  
388 relatively low levels of public spending on formal LTC.

389 This market-replacement approach fundamentally diverges from the well-being  
390 valuation method (Costa-Font & Vilaplana-Prieto, 2024; Schneider & Kleindienst,  
391 2016), which incorporates a comprehensive assessment of caregivers' welfare  
392 impacts, including both positive aspects (emotional satisfaction, strengthened family  
393 bonds) and negative outcomes (stress, career disruptions). The methodology used in  
394 EC (2021) adopts a more focused scope, specifically calculating the market equivalent  
395 value of informal care hours provided by family members to elderly and disabled  
396 relatives. The resulting valuations are consistently higher than those derived from  
397 the well-being approach, primarily because the market-replacement method does not  
398 account for the economic costs of caregiving.

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<sup>11</sup> <https://apolitical.co/solution-articles/en/how-to-value-unpaid-care-work-the-10-trillion-question>.

**Table 3.2** Informal care and public LTC spending as % of GDP.

I	Proxy good	Opportunity cost	Public spending
France	5	4.2	1.9
Spain	4.9	3.7	0.7
Greece	3.9	2.7	0.2
Italy	3.6	2.9	1.7
Netherlands	1.5	1.4	3.7
Sweden	1.6	1.6	3.3
Germany	0.9	0.8	1.6
EU27	2.7	2.4	1.7

EC (2021)

### 399 3.2.2 Care Motives

400 Children often care for their disabled parents for a variety of reasons rooted in  
 401 emotional, social, cultural, and practical factors. The three main reasons that can be  
 402 combined are altruism, family norm, and reciprocity or exchange.

403 One of the primary reasons children care for their disabled parents is altruism,  
 404 namely, the deep emotional bond and love they share. The instinct to care for one's  
 405 parents can be seen as a natural response to the nurturing they received as children.  
 406 Altruistic children find a deep sense of personal satisfaction and fulfillment in caring  
 407 for their parents. They are not compelled and do not seek any reward.

408 Another reason is reciprocity and exchange. Many children feel a sense of  
 409 reciprocity—they want to give back to their parents who spent years providing for  
 410 and nurturing them. Caring for a disabled parent can be seen as a way to express  
 411 gratitude and to return the care that was once given to them. With three or even four  
 412 generation families, one observes a sort of implicit compact. Grandparents help their  
 413 grand-children and when they turn disabled, they are cared for by their own children.  
 414 There are different types of compacts, on which we come back below.

415 In many societies, there are specific cultural norms and expectations regarding  
 416 the care of the elderly or disabled family members. It is expected that children will  
 417 take on the primary caregiving role, rather than utilizing institutional care. This norm  
 418 can be constricting and thus have some negative implications on the health of the  
 419 caregivers.

420 Let us add that in some countries, there are laws that obligate adult children to care  
 421 for their aging parents, which can also play a role in why children take on these respon-  
 422 sibilities. In any case, each family's situation is unique, and the decision to care for a  
 423 disabled parent involves a complex interplay of these and other factors. For example,  
 424 in France, there is a clear legal obligation for adult children to financially support  
 425 their aging parents through what's called "l'obligation alimentaire" (maintenance  
 426 obligation). This obligation extends beyond just parents to include grandparents and  
 427 other direct ascendants. It covers essential needs like food, housing, clothing, and

428 medical care when parents cannot afford these necessities themselves. Parents can  
 429 request a maintenance allowance from their children, particularly for care-related  
 430 expenses. These filial responsibility laws are actively enforced, making it a genuine  
 431 legal duty rather than just a family expectation.

432 Klimaviciute et al. (2017) test alternative models of long-term caring motives.  
 433 They consider three canonical motives: pure altruism, exchange and family norm.  
 434 Their database is the second wave of the Survey of Health, Ageing and Retirement  
 435 in Europe (SHARE), which allows linking almost perfectly and with complete infor-  
 436 mation children and their parents' characteristics. Comparing the empirical results to  
 437 the theoretical models developed, it appears that, depending on the regions analyzed,  
 438 long-term caring is driven by moderate altruism or by family norm. In contrast,  
 439 Alessie et al. (2014), also using SHARE data, stress the importance of exchange  
 440 motive in intergenerational transfers.

### 441 3.2.3 *Collateral Risks for the Caregivers*

442 Caring for elderly loved ones is a profoundly noble and often rewarding experience,  
 443 but it can also carry substantial health risks for caregivers. When an individual takes  
 444 on the role of a caregiver, particularly for an elderly family member, they frequently  
 445 face a range of challenges that can impact their physical, emotional, and mental  
 446 health. Understanding these impacts is crucial for caregivers to seek appropriate  
 447 support and maintain their well-being.

448 Caregiving often involves physical tasks such as lifting, bathing, and assisting  
 449 with mobility. These activities can lead to physical strain, injuries, and chronic pain.  
 450 Caregivers may also experience neglect of their own health needs, leading to further  
 451 physical health problems. Chronic stress is a common outcome for many caregivers,  
 452 as they juggle caregiving with other personal and professional commitments. Over  
 453 time, chronic stress can lead to serious health issues, including hypertension, car-  
 454 diovascular disease, and weakened immune response. They often experience high  
 455 levels of emotional and mental health challenges, including depression, anxiety,  
 456 and feelings of isolation. The emotional burden of caring for someone who may  
 457 be experiencing significant declines in physical and cognitive health can be pro-  
 458 found.

459 Furthermore, caregivers often isolate themselves or feel cut off from social inter-  
 460 actions due to the demands of caregiving. Social isolation can impact mental health,  
 461 leading to increased risks of mortality and conditions like heart disease and demen-  
 462 tia. The cumulative effect of long-term caregiving can lead to burnout—a state of  
 463 physical, emotional, and mental exhaustion. Burnout can cause caregivers to feel less  
 464 capable of providing care and may affect their overall sense of self and purpose.

465 To mitigate these impacts, caregivers must acknowledge the challenges and seek  
 466 support where possible. This can include tapping into resources such as local sup-  
 467 port groups, respite care services, counseling, and seeking help from other family  
 468 members or professional services. It's also crucial for caregivers to maintain their

469 health through regular check-ups, healthy lifestyle choices, and setting aside time for  
470 personal rest and recreation. Recognizing the signs of stress and seeking help early  
471 is essential for both the well-being of the caregiver and the quality of care they can  
472 provide to their loved one. It can lead him or more often her to consider alternatives  
473 such as institutionalizing the dependent parent or spouse.

474 Those collateral effects of caregiving have received much attention in recent work.  
475 First, as shown by Schulz and Sherwood (2008) as well as Van Houtven et al. (2013),  
476 family caregiving has a number of negative impacts on the health and the career of  
477 helpers. The negative effects seem to increase with the severity of the dependence  
478 particularly in case of dementia. They are expected to be more important when the  
479 motive is the family norm and not altruism. Stöckel and Bom (2022) estimate the  
480 longer-term and dynamic effects of providing informal care on caregivers' health  
481 in the UK. Their results suggest substantial negative health effects confined to the  
482 mental domain and asymmetrically experienced by caregivers providing more than  
483 20h of weekly care. Furthermore, for caregivers providing multiple years of higher  
484 intensity care, the negative effects persist.

485 Health issues can result in a lack of stability in care provision, which may serve  
486 as a compelling argument in favor of institutionalization. Drawing on data from  
487 the 2010–2018 waves of the Health and Retirement Study, Angrisani et al. (2025)  
488 examine how the stability of informal care influences depressive symptoms among  
489 older adults with ongoing care needs and how it mitigates the stress associated with  
490 limitations in activities of daily living (ADL) and instrumental activities of daily  
491 living (IADL). Their findings indicate that stable informal care is strongly linked to  
492 lower levels of depressive symptoms. Moreover, stability in care significantly reduces  
493 stress stemming from IADL limitations, offering protective benefits for mental health.  
494 This underscores the critical importance of long-term commitment to caregiving for  
495 the well-being of individuals with chronic care needs.

496 The institutional and policy contexts play a role in determining caregiving experi-  
497 ences. Kaschowitz and Brandt (2017) emphasize that caregiving outcomes vary  
498 not only across welfare regimes but even among countries with similar welfare state  
499 models. Additional evidence suggests that women in Southern European welfare  
500 states tend to experience higher levels of caregiving-related stress compared to those  
501 in Northern welfare regimes, where more robust public care systems can mitigate the  
502 burden (Brenna & Di Novi, 2016). However, much of the existing research in this  
503 area relies on cross-sectional data, which limits the ability to capture the dynamic  
504 nature of caregiving or to account for selection effects. As Vlachantoni et al. (2013)  
505 argue, longitudinal data methods are essential to estimate the causal impact of care-  
506 giving on health and well-being in a more accurate way. Recently, using SHARE  
507 data, Chaves Araujo et al. (2025) observe limited average health impacts, with only  
508 a short-run decline in quality of life for low-intensity carers.

### 509 3.2.4 Strategic Interaction Among Family Members

510 The long-term care literature offers several theoretical and empirical studies dealing  
 511 with the strategic interaction among family members. These studies vary along several  
 512 dimensions: which family members participate in the decision-making process,  
 513 which types of care and/or living arrangements are considered, whether family members  
 514 have common preferences, and whether other decisions are determined jointly  
 515 with long-term care decisions. Given the variety of long-term care arrangements and  
 516 the connection between care and living arrangements, one model cannot capture all  
 517 possible aspects of a family's long-term care and living arrangements.

518 Most of the existing theoretical models involve families consisting of an elderly  
 519 parent and only one child in the decision-making process. Kotlikoff and Morris (1990)  
 520 present a model where parent and child decide whether to form an intergenerational  
 521 household or to maintain separate households. The parent and child solve separate  
 522 maximization problems if they live separately but maximize a weighted average of  
 523 their individual utility functions subject to their pooled budget constraint if they live  
 524 together. In this latter case, the weights are determined by a bargaining process.

525 With the lengthening of life, more and more families comprise three and even  
 526 four generations and furthermore, many individuals experience two stages in their  
 527 old age, one of good health and a lot of leisure and one of disability and dependence.  
 528 We thus see grandparents who first care for their grandchildren and then go through  
 529 a stage of disability and dependence and get cared for by their own children. This  
 530 family compact involving child-care in exchange for eldercare has been analyzed by  
 531 Lefebvre et al. (2025) using a model with subgame perfect equilibrium with the child  
 532 acting as a Stackelberg leader. This model is then successfully tested using SHARE  
 533 data.

534 In other types of models, more than one adult child in a family participate in the  
 535 family's long-term care decision. The potential disagreement among adult siblings  
 536 and between adult children and elderly parents motivates the development of a game-  
 537 theoretic framework where the players include the parent and all of her children. The  
 538 players of the game are an elderly parent who is functionally impaired but living  
 539 independently and her children. The original model in that respect is the strategic  
 540 bequest one of Bernheim et al. (1985), who consider a setting in which the parent  
 541 influences the caring decisions of his children by holding wealth in bequeathable  
 542 forms and by conditioning the division of bequests on the level of care the children  
 543 are providing. Their model generates robust empirical predictions. The strategic  
 544 bequest motive has been tested by a number of economists with the conclusion that  
 545 bequests are often used as compensation for services rendered.

546 For example, Hiedemann and Stern (1999) model the family's long-term care  
 547 decision as a two-stage non-cooperative game. The players of the game are an elderly  
 548 parent who is functionally impaired but living independently and her children. In the  
 549 first stage of the game, each child simultaneously announces whether she offers to  
 550 care for the parent. In the second stage, the parent chooses among the available  
 551 care arrangements. They use data from the National Long-term Care Survey. Their

552 model leads to reasonable estimates of the marginal effects of various parent and  
 553 child characteristics on caregiving behavior. In particular, it predicts that mothers  
 554 are more likely than fathers to be cared for by children, married parents are more  
 555 likely than single parents to live independently, daughters are more likely than sons to  
 556 care for parents, and family members' valuation of care provided by a child depends  
 557 negatively on the distance between the parent and the child.

558 Using a collective choice model of the family and data from SHARE, Canta et al.  
 559 (2024) deal with the question of the relative contribution of spouses to the long-term  
 560 care needs of their dependent parents and parents-in-law. Their paper focuses on the  
 561 role of gender and blood relationships as well as the effect of differential opportunity  
 562 costs within the couple. The results tend to confirm the existence of gender and blood  
 563 biases in the level of informal care provided by each spouse, while their wage does  
 564 not seem to play a large role. When they consider the relative level of informal care  
 565 by spouses, the gender and blood biases are confirmed. Furthermore, the wage ratio  
 566 is negatively related to the informal care ratio. These results imply that informal care  
 567 and private insurance coverage may depend on the gender composition of children,  
 568 which may justify differentiated public LTC transfers.

569 The dynamics of eldercare are intrinsically linked to societal structures, with gen-  
 570 der roles manifesting distinctly across cultural contexts. While contemporary soci-  
 571 eties increasingly demonstrate egalitarian care patterns, patriarchal environments  
 572 reveal more nuanced familial support mechanisms. In a compelling recent investi-  
 573 gation, Ho and McGarry (2025) illuminate the intricate landscape of intergenerational  
 574 transfers within China's traditional familial framework. Their research unveils  
 575 a gendered pattern of parental support that is both striking and systematic. Sons  
 576 emerge as the primary providers of substantial, coresidential assistance, monopoliz-  
 577 ing both significant financial transfers and residential care. Daughters, by contrast,  
 578 tend to contribute through more modest, typically smaller-scale transfers. Perhaps  
 579 most intriguing is the researchers' observation of intra-gender transfer dynamics.  
 580 When siblings of the same gender increase in number, a pronounced "crowding-  
 581 out" effect emerges: sons reduce their contributions when brothers proliferate, while  
 582 daughters similarly diminish support in the presence of additional sisters. Notably,  
 583 this pattern remains consistent across both in-kind and monetary transfers, suggest-  
 584 ing a deep-rooted gender-specific approach to familial support that transcends even  
 585 relatively fungible forms of assistance.

### 586 3.2.5 *Strategic Impoverishment*

587 Most countries have LTC programs for the low-income elderly. The best known of  
 588 these programs is the U.S. Medicaid that provides an important safety net for people  
 589 who are poor or become poor, either because of the high costs of health and long-term  
 590 care services or for other reasons. Indeed, some individuals reduce their countable  
 591 assets in order to qualify for Medicaid. This is referred to as spending down assets  
 592 for Medicaid. Many other countries have needs-based program such as Medicaid,

593 meaning applicants must meet strict income and asset limits to qualify. For budgetary  
594 reasons, they also face the need of discouraging individuals from spending down their  
595 assets to qualify for their benefits.

596 This behavior has been labeled “strategic impoverishment.” Medicaid has both  
597 income and asset limits, which vary by state, but in most cases, individuals can only  
598 have a few thousand dollars in “countable” assets to qualify. Assets such as cash,  
599 savings, investments, and certain property are considered countable, while some  
600 assets, like a primary home (up to a value limit), a car, and personal belongings, may  
601 be exempt. There are unavoidable reasons for spending down: paying for medical  
602 expenses, long-term care, or other healthcare costs. There are also reasons that could  
603 be avoided such as purchasing exempt assets, like home modifications or a car,  
604 or transferring assets to family members. There exist some ways to discourage or  
605 mitigate asset spend-down for Medicaid. First of all, encouraging individuals to  
606 purchase private long-term care insurance can help them cover the costs of care  
607 without needing to rely on Medicaid. In the same vein, promoting financial planning  
608 that incorporates healthcare costs in retirement, such as opening Health Savings  
609 Accounts or other tax-advantaged savings vehicles could encourage people to save  
610 more for healthcare in retirement rather than relying on Medicaid.

611 Another way is to penalize individuals who transfer assets within a certain “look-  
612 back period” (typically five years). Tightening these rules or extending the look-  
613 back period could further discourage individuals from gifting or transferring assets  
614 to family members in order to qualify for Medicaid. Some argue that Medicaid eligi-  
615 bility thresholds for long-term care are too low, forcing people to spend down their  
616 assets. Raising asset and income thresholds would reduce the need for individuals  
617 to impoverish themselves to qualify for benefits. At the same time, such a policy  
618 would increase the budgetary pressures on the program. Finally, there is the idea  
619 of offering Medicaid Partnership Programs that allow individuals to keep more of  
620 their assets while still qualifying for Medicaid if they have long-term care insurance.  
621 Expanding these programs could reduce the incentive to spend down assets while  
622 still providing care. Each of these approaches involves balancing the protection of  
623 individuals’ financial security with the need to ensure fair access to healthcare. For  
624 any reforms, it’s essential to consider potential unintended consequences, such as  
625 increasing the financial burden on middle-class families or reducing access to care  
626 for low-income individuals without neglecting the budgetary cost of the programs.  
627 In the remaining of this paper, we focus on the budgetary issue showing that both  
628 increasing the look back period or decreasing the asset threshold can contribute to  
629 decreasing the number of users of Medicaid and thus to relax the financial constraints  
630 to which today governments are subject in rapidly aging societies.

631 There is a growing empirical literature that examines the hypothesis that individ-  
632 uals may strategically offload assets to meet the eligibility requirements of means-  
633 tested long-term care (LTC) public programs. Much of this research focuses on the  
634 U.S. Medicaid system and investigates the effects of eligibility restrictions on factors  
635 such as the number of Medicaid applicants, personal savings, and intergenerational  
636 transfers.

637 Bassett (2007) finds that individuals' self-assessed probability of entering a nursing  
 638 home is a significant predictor of their likelihood to transfer assets. Liu and  
 639 Mukherjee (2020) explore how restricting Medicaid eligibility affects asset transfers  
 640 to children, showing that these effects are particularly notable for individuals with a  
 641 high risk of requiring nursing home care. In the same line, Ayyagari and He (2019)  
 642 find that, in response to more stringent penalties on asset transfers, married seniors  
 643 with high expectations of future nursing home use significantly modified the structure  
 644 of their wealth by reducing the countable assets, relative to married seniors with  
 645 low expectations.

646 More recently, Lozachmeur et al. (2025) have shown that the Medicaid reform  
 647 consisting in lengthening the look-back period had the double effect of modifying the  
 648 temporal profile of inter vivos gifts and decreasing the number of applicants to this  
 649 program. We come back on this in the next chapter. However, there is no consensus  
 650 on whether elderly individuals frequently transfer assets to their children to qualify  
 651 for Medicaid. For instance, Norton (1995) concludes that spending down assets is  
 652 not a widespread practice, suggesting that the phenomenon may be less prevalent  
 653 than often assumed.

654 Finally, note that most countries do have asset-related restrictions for long-term  
 655 care, but they typically handle it quite differently than the U.S. system. For example,  
 656 in the United Kingdom there exist capital limits for long-term care assistance. No  
 657 assistance with costs would be provided where an individual has capital of more than  
 658 23,250 and reduced assistance will be provided where capital is between the upper  
 659 and lower capital limits. However, this system is generally less punitive than the U.S.  
 660 approach.

### 661 3.2.6 *Better at Home Than in a Nursing Home?*

662 The decision between moving to a nursing home or staying at home with adequate  
 663 care for a disabled elderly person involves a complex balance of medical, emotional,  
 664 and practical considerations. Nursing homes ideally provide a structured environment  
 665 where professional medical care is available around the clock. This ensures that any  
 666 chronic health issues or emergencies are managed promptly, and access to specialized  
 667 services such as physical therapy, rehabilitation, and mental health support is readily  
 668 available. Additionally, nursing homes offer a social atmosphere that can be beneficial  
 669 for those who might otherwise experience isolation, with organized activities and  
 670 opportunities to engage with peers. For family members, placing a loved one in a  
 671 nursing home can relieve the emotional and physical demands of caregiving, allowing  
 672 them to focus on maintaining a supportive and loving relationship. On the other hand,  
 673 staying at home with proper care has distinct advantages, particularly the comfort  
 674 and emotional stability of being in a familiar environment. This setting allows the  
 675 elderly individual to maintain a sense of autonomy and independence, with daily  
 676 routines and personal preferences preserved. Personalized care at home ensures that  
 677 the specific needs of the individual are met with flexibility, often fostering a stronger

678 bond between the caregiver and the person receiving care. Staying at home can  
679 also reduce the stress and potential emotional distress associated with institutional  
680 living, which may include adjusting to new surroundings and adhering to structured  
681 schedules. Additionally, it allows for closer family involvement, facilitating more  
682 natural and frequent interactions with loved ones.

683 From a financial perspective, while nursing homes can be expensive, the cost of  
684 staying at home can vary based on the level of care required, modifications to the  
685 home, and the hiring of professional caregivers. Home care can sometimes be more  
686 cost-effective, particularly if family members can supplement care or if community  
687 resources are available. However, for individuals with complex medical conditions,  
688 the comprehensive services provided in a nursing home might outweigh the potential  
689 cost savings of home care. Ultimately, the choice between a nursing home and home  
690 care depends on the elderly person's medical needs, personal preferences, and the  
691 resources available to them and their family. Each option offers unique advantages,  
692 and the decision should focus on ensuring the individual's quality of life, comfort,  
693 and well-being.

694 In many countries, recent public policies have increasingly emphasized home- and  
695 community-based care for the elderly as an alternative to institutional care. This shift  
696 is driven by the desire of older adults to remain in their homes, which is often more  
697 cost-effective and associated with a better quality of life. However, the relevance of  
698 this policy is questionable, as informal caregiving is on the decline—due to factors  
699 such as more women working, higher divorce rates, fewer children, and the growing  
700 trend of children living farther away. In light of these changes, consolidating elderly  
701 individuals in nursing homes may actually be a more sensible approach, both in terms  
702 of reducing costs and potentially improving quality of life.

703 A recent study by Laferrère and Schoenmaeckers (2024), using SHARE data,  
704 suggests that while satisfaction among institutionalized individuals initially decreases  
705 after admission, it tends to return to pre-admission levels over time. This finding  
706 echoes earlier research by Bakx et al. (2020), which showed that delaying nursing  
707 home admission may not always result in better outcomes. Excess mortality in nurs-  
708 ing homes is a critical issue in aging societies, particularly as the number of people  
709 over 80 is expected to double in the coming decades (OECD, 2020). However, there  
710 is limited evidence to suggest that spending the final years of life in a community  
711 setting accelerates death. The scarcity of administrative and survey data has hin-  
712 dered research in this area. Second, the choice between staying home with family  
713 help and going to nursing home is not trivial, particularly in case of pandemic such  
714 as COVID-19. In a recent paper covering a large number of countries and comparing  
715 the mortal impact of staying home versus residing in a nursing home, Flawinne et al.  
716 (2023) show that all things being constant staying home is safer in some countries  
717 (Germany, France, Eastern Europe) whereas in others it is safer to move to a nursing  
718 home.

719 A recent study by Bassoli et al. (2025) examines the case of France and finds  
720 that individuals living in nursing homes are no more likely to die than those residing  
721 at home, provided they have similar levels of limitations in activities of daily liv-  
722 ing (ADLs). Several other studies have sought to explore the mortality differences

723 between people in nursing homes and those at home. For instance, Bakx et al. (2020)  
 724 analyze administrative data from the Netherlands and conclude that mortality rates  
 725 for nursing home residents are not significantly different from those for individuals  
 726 living at home. Similarly, Braggion et al. (2020) use Italian data to show that mortal-  
 727 ity rates spike in the first few months after admission to a nursing home, particularly  
 728 for patients who were recently hospitalized. In these cases, the deterioration of pre-  
 729 existing chronic conditions is often the leading cause of death. In summary, while  
 730 various studies have attempted to address the question of whether excess mortality  
 731 occurs in nursing homes or at home, the evidence remains inconclusive.

732 These findings tend to suggest that home care may be preferable to institutional  
 733 care, given its lower costs and additional benefits, particularly since mortality out-  
 734 comes appear equivalent between the two settings.

### 735 3.2.7 *Siblings' Location*

736 As informal care becomes more intensive, it often demands geographical proximity,  
 737 which can be challenging to reconcile with the career aspirations and mobility of  
 738 adult children. The location of children can certainly be influenced by the need to  
 739 care for aging or disabled parents, though it is not the sole determinant. A range of  
 740 factors comes into play. When a parent requires significant care, children may opt  
 741 to live closer to provide direct support. However, if professional caregivers or other  
 742 family members are available, proximity may become less critical. Opportunities  
 743 for higher wages or career advancement in distant locations might compel children  
 744 to live farther away. The presence of other siblings or relatives who can assist with  
 745 caregiving may also reduce the need for a child to relocate. Furthermore, cultural  
 746 expectations can shape caregiving decisions: in some societies, there is an expectation  
 747 for children to live near their aging parents, while in others, long-distance caregiving  
 748 is more common. In essence, while geographical proximity can influence caregiving  
 749 choices, it ultimately depends on the balance between direct (physical) and indirect  
 750 (financial or logistical) support. When children live far from their aging parents due  
 751 to professional or other commitments, their capacity for direct care is limited, often  
 752 relegating them to a role focused on financial support.

753 Konrad et al. (2002) investigate whether the presence of younger siblings influ-  
 754 ences children's residential choices relative to their parents. Using a game-theoretic  
 755 framework and data from the German Aging Survey, they show that birth order plays  
 756 a significant role in caregiving decisions through strategic location choices. Specif-  
 757 ically, they find that first-born children are more likely to live farther from their  
 758 parents than second-born children or only children. This pioneering study intro-  
 759 duces a novel perspective to the literature on intergenerational support, empha-  
 760 sizing the role of long-term strategic behavior within families. Hank (2007), using  
 761 data from SHARE, identifies a striking North–South divide in Europe: while co-  
 762 residence and daily contact are more prevalent in Mediterranean countries, Northern  
 763 European families maintain frequent communication despite greater physical dis-

764 tance. He attributes these patterns to differing cultural norms and welfare systems,  
765 highlighting the importance of institutional context in shaping family dynamics. In  
766 contrast, Compton and Pollak (2013), using data from the National Survey of Fam-  
767 ilies and Households (NSFH), find that, in the USA, proximity to elderly parents  
768 is driven more by children's education and marital status than by caregiving needs.  
769 They challenge the common assumption that proximity necessarily signals a caregiv-  
770 ing intention and argue that co-residence and proximity should be treated as distinct  
771 behavioral choices.

772 Building on this idea, Johar and Maruyama (2012) show that siblings make loca-  
773 tion decisions non-cooperatively and proximate living with elderly parents is an  
774 under-provided public good. According to these authors, the impact of this public  
775 good problem is striking. Of the 2010 HRS families with multiple children, if fami-  
776 lies had fully internalized externality and jointly maximized family utility, 17% more  
777 parents would have had at least one child nearby. Maruyama and Johar (2017) con-  
778 ceptualize proximity as a strategic decision within families. Their sequential game-  
779 theoretic model suggests that siblings may deliberately avoid living close to elderly  
780 parents to shirk caregiving responsibilities, resulting in coordination failures. Using  
781 data from HRS, they find evidence of limited but notable strategic behavior. For exam-  
782 ple, in two-child families, over 92% of children exhibit dominant location strategies.  
783 They also find under-provision of informal care, largely due to free-riding. In fami-  
784 lies with three or more children, 28.8% make suboptimal location choices from the  
785 perspective of overall family welfare. Their analysis highlights a modest first-mover  
786 advantage and public goods inefficiencies—reporting that 18.3% more parents would  
787 have had at least one child living nearby under cooperative decision-making. More-  
788 over, elder siblings may exploit early relocation as a strategic advantage. Given that  
789 informal care often substitutes for formal care when the latter is costly or limited, the  
790 authors argue that improved family coordination and targeted public policies—such  
791 as caregiver subsidies or location-based incentives—could enhance caregiving effi-  
792 ciency. Stern (2023) builds on the work of Konrad et al. (2002), Johar and Maruyama  
793 (2012) and Maruyama and Johar (2017), who focus on the strategic behavior of sib-  
794 lings with the result that a first-born child might have an incentive to move away, thus  
795 causing younger siblings to stay nearby. He extends this literature by modelling fami-  
796 lies with multiple children and adding uncertainty about the preferences of siblings  
797 among each other. Stern estimates the model using structural estimation methods to  
798 show that the addition of uncertainty plays an important role both in terms of model  
799 fit and in terms of welfare analysis.

800 Pezzin et al. (2009) explore another layer of family structure, showing that caregiv-  
801 ing behavior varies depending on whether children are biological, joint, or stepchild-  
802 ren. Their findings underscore the importance of familial ties in shaping caregiving  
803 commitments within households. Engers and Stern (2002) introduce a structural  
804 game-theoretic model that allows for the possibility that not all family members  
805 engage in caregiving decisions—a departure from the collective decision-making  
806 assumptions often found in the literature. Using data from the 1984 National Long-  
807 Term Care Survey, they demonstrate that the voluntary participation model fits the  
808 data significantly better than the collective one. Their results indicate that distance

809 from the parent is the strongest predictor of whether a child provides care, and that  
 810 daughters and married children are more likely to do so. They also show that care-  
 811 giving behavior responds to public subsidies, Medicaid policies, and the availability  
 812 of formal care services. Extending this approach, Byrne et al. (2009) incorporate  
 813 joint decision-making over caregiving, labor supply, consumption, and leisure into a  
 814 comprehensive household model. Drawing on data from the Health and Retirement  
 815 Study (AHEAD), they find that 22% of elderly respondents received some form of  
 816 care, with 90% of these receiving informal (unpaid) care from family members. Care-  
 817 giving is more likely among those with ADL (Activities of Daily Living) limitations,  
 818 those who are unmarried, and women. They find evidence of strategic interactions,  
 819 although these vary across family contexts. In a recent contribution, Nishimura et  
 820 al. (2025) focus on the caregiving arrangements of two-sibling families, analyzing  
 821 how their residential choices (close/close, far/far, or close/far) influence the levels  
 822 of informal and formal care provided to a disabled parent. Key determinants include  
 823 the nature of the relationship between siblings (cooperative vs. non-cooperative), the  
 824 wage gap (affected by innate ability and location), the substitutability or comple-  
 825 mentarity between informal and formal care, the degree of altruism, the severity of  
 826 the parent's disability, and the availability of public support.

### 827 3.2.8 *Informal Versus Formal Care*

828 As we see below, the relation between formal and informal care has an important  
 829 impact on the design of public LTC policies. The relationship between informal and  
 830 formal care is complex and can be both substitutive and complementary, depending  
 831 on various factors. They are likely to be substitutes when informal caregivers provide  
 832 services that would otherwise require paid formal care, when families choose between  
 833 hiring professional help or providing care themselves or when policy frameworks  
 834 treat them as alternatives (e.g., cash-for-care programs that allow beneficiaries to  
 835 choose between formal services or paying family caregivers). On the contrary, they  
 836 tend to be complementary when formal services support informal caregivers (respite  
 837 care, training programs) or when formal care addresses specific medical needs while  
 838 informal care provides emotional support and help with daily activities. Existing  
 839 scanty literature suggests that the relationship depends on needs and intensity (higher  
 840 dependency often requires both types) and on type of services (personal care vs.  
 841 household help). Most evidence points to a mixed relationship where they can be  
 842 both substitutes and complements depending on the specific circumstances and needs  
 843 of the care recipient. Among early studies, we can mention Pezzin et al. (1996)  
 844 who found evidence of substitution between informal and formal care in the USA,  
 845 suggesting that formal care may crowd out family-provided care as well as Van  
 846 Houtven and Norton (2004) who also concluded that formal and informal care are  
 847 largely substitutes, using data from the U.S. Health and Retirement Survey (HRS).

848 In the European Context, we have the widely cited paper by Bonsang (2009)  
 849 who examines the relationship between informal and formal care using data from

850 SHARE. It shows that informal care can substitute for formal care but primarily for  
851 low-skilled care needs. The substitution relationship depends significantly on the type  
852 of care and level of disability of the care recipient. Informal care tends to substitute  
853 for formal care when addressing low-skilled care needs (like household help or  
854 basic assistance with daily activities). As care needs become more complex and  
855 involve higher-skilled care (such as nursing or medical care), the relationship shifts  
856 toward complementarity rather than substitution. There is also the paper of Bolin  
857 et al. (2008) that examines substitution effects across European countries. In short,  
858 the existing literature provides mixed evidence, with context-specific and policy-  
859 contingent outcomes. While formal and informal care are often substitutes in terms of  
860 time and tasks, they may be complements in broader caregiving strategies, especially  
861 when informal caregivers provide emotional support and coordinate professional  
862 services.

863 Using the most recent waves of SHARE data, Perelman and Pestieau (2025)  
864 examine the complementarity and substitutability between formal and informal care  
865 across 27 European countries. The authors use data concerning the two types of  
866 care (formal  $m$  and informal  $a$ ) for each disability level  $d$ . In the  $(a, m)$  plane,  
867 they obtain a point cloud corresponding to each value of  $d$ . From each cloud, they  
868 construct a best practice curve that identifies the optimal combinations of  $a$  and  
869  $m$  for the considered disability level  $d$ . Their analysis reveals that these curves are  
870 concave and become increasingly curved as disability severity rises. This pattern  
871 demonstrates a nuanced relationship that depends critically on the level of disability:  
872 the elasticity of substitution between care types diminishes progressively with greater  
873 elderly dependency, indicating that formal and informal care become increasingly  
874 necessary rather than interchangeable as care needs intensify.

### 875 3.3 The State

876 The role of the state in providing long-term care (LTC) for older adults is becoming  
877 increasingly critical due to demographic shifts leading to aging populations in many  
878 countries. This importance is heightened by the negligible role of the market and the  
879 gradual retraction of traditional family caregiving roles. LTC encompasses a broad  
880 spectrum of services essential for individuals who cannot perform basic activities of  
881 daily living (ADLs), such as bathing, dressing, and eating, due to chronic illnesses,  
882 disabilities, or the natural aging process. One primary responsibility of the state is to  
883 ensure the funding and financial support for LTC. Typically, most nations maintain  
884 public programs specifically aimed at supporting low-income individuals, funded  
885 through taxation or social insurance systems. Moreover, states also offer direct finan-  
886 cial assistance to individuals or subsidize services to enhance affordability. Equally  
887 crucial is the state's role in regulating LTC facilities to ensure quality care, safety, and  
888 the dignity of residents. This involves regular inspections and stringent enforcement  
889 of standards to uphold high-quality care.

890 Additionally, the state must implement training requirements for LTC staff to  
 891 ensure they possess the necessary skills. This regulatory oversight is increasingly  
 892 important given the rising incidents of abuse in institutions such as nursing homes.  
 893 However, public intervention in LTC is often characterized by its underdevelop-  
 894 ment and lack of coordination. Fragmentation within the system presents significant  
 895 challenges, impacting the efficiency, quality, and overall accessibility of care. In  
 896 many countries, the responsibility for LTC is scattered across various government  
 897 levels—federal, regional, and local—leading to inconsistencies in policy, funding  
 898 mechanisms, and service delivery models. This results in varied standards of care  
 899 and eligibility criteria, creating disparities across regions.

900 Funding for LTC can originate from diverse sources, including public health  
 901 insurance, social welfare programs, private insurance, and out-of-pocket payments.  
 902 The complexity of these funding streams can complicate the navigation process for  
 903 both service providers and recipients. There is a pronounced need for integrated care  
 904 models. Some countries are advancing toward a more coordinated approach that aims  
 905 to align healthcare, social services, and LTC. These efforts also include harmonizing  
 906 policies across jurisdictions to establish a more uniform standard of care.

907 An example is France’s Fifth Risk Plan, which seeks to address dependency in  
 908 old age—a recognized “fifth risk” in its social protection scheme that already covers  
 909 illness, old age, family, and employment. However, due to budget constraints, this  
 910 initiative remains pending. By emphasizing greater coordination and integration,  
 911 countries can strive for a more effective and equitable LTC system. This approach  
 912 not only simplifies management and improves care quality but also ensures that the  
 913 dignity and well-being of the elderly are sustainably protected. Two things seem  
 914 certain. On one hand, the role of the State in long-term care will need to increase.  
 915 On the other hand, the State must rely, as much as possible, on the two other pillars:  
 916 family and the market. In the following chapter, we present a series of social insurance  
 917 models that cover the loss of autonomy. It is impossible to capture every aspect of  
 918 the interaction between the state, family, and market in a single model. Therefore, in  
 919 the next section, we present models that focus on specific aspects of the relationship  
 920 between public policy, family solidarity, and private insurance.

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Abstract	<p>In this chapter, we explore various models of public long-term care (LTC) insurance schemes. Our analysis begins by excluding the role of family—spouse and children—in providing care. We then incorporate family assistance, focusing particularly on support from children. Unlike previous chapters, this one adopts a more analytical approach. Below, we present a concise summary of the key points covered in each section.</p>	

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# Chapter 4

## Models of Social Insurance



0 In this chapter, we explore various models of public long-term care (LTC) insurance  
1 schemes. Our analysis begins by excluding the role of family—spouse and children—  
2 in providing care. We then incorporate family assistance, focusing particularly on  
3 support from children. Unlike previous chapters, this one adopts a more analytical  
4 approach. Below, we present a concise summary of the key points covered in each  
5 section.

6 When family solidarity is set aside, the optimal solution for long-term care  
7 would not necessitate social insurance. In this framework, a combination of non-  
8 distortionary income taxation and actuarially fair private insurance would suf-  
9 fice. However, when tax distortions are inevitable, social LTC insurance becomes  
10 beneficial—especially under the widely accepted assumption that disability risk and  
11 income are negatively correlated. Social insurance, in this case, facilitates a more  
12 efficient redistribution of resources with fewer distortions compared to income tax-  
13 ation.

14 When family support is considered, it becomes essential to distinguish between  
15 situations where such care is guaranteed and those where it is uncertain. Practical  
16 constraints, such as labor mobility or health issues, can render eldercare by children  
17 or spouses impractical, and these factors must be accounted for in designing LTC  
18 social insurance. For example, in cases where filial altruism varies but income is  
19 uniform, social insurance should primarily support elderly individuals who cannot  
20 depend on their children. Conversely, when altruism is unobservable, public benefits  
21 are typically kept modest to prevent exploitation by altruistic families. The interaction  
22 between private insurance and the conditional nature of public benefits further shapes  
23 the desirability of social LTC insurance.

24 Disability often reduces the value of bequests, as children of healthy parents inherit  
25 more than those whose parents face prolonged, expensive periods of disability. This  
26 dynamics suggests that taxing bequests could serve as a practical method for funding  
27 public LTC benefits. Moreover, in scenarios where mutual altruism exists between

28 parents and children, a strong case can be made for integrating social LTC insurance  
 29 with an inheritance tax and subsidies for informal care.

30 One factor contributing to the limited uptake of LTC insurance is the unattractive  
 31 reimbursement structures typically offered. The market often struggles to adequately  
 32 cover individuals who experience extended periods of dependency. To address this, a  
 33 deductible system has been proposed. Under such a scheme, individuals would bear  
 34 a portion of their dependency costs for a defined period, after which all expenses  
 35 exceeding a certain threshold would be covered by social insurance. Public interven-  
 36 tion becomes even more necessary when governments are more efficient than private  
 37 insurers or when LTC needs vary significantly across individuals.

38 In many countries, access to social assistance for dependency care is subject  
 39 to means testing. However, it is often observed that individuals who initially have  
 40 sufficient resources to cover their own needs deliberately impoverish themselves to  
 41 qualify for benefits that are not intended for them. This raises the question of how  
 42 such behavior can be effectively prevented.

43 Most of the models discussed in this analysis are static in nature. However, we  
 44 also present a dynamic approach that examines the impact of dependency on capi-  
 45 tal accumulation and national production, as well as the potential effects of public  
 46 insurance on these variables. The findings suggest that dependency tends to stimulate  
 47 capital accumulation, whereas public insurance has a discouraging effect on it.

48 Most LTC social insurance models are normative, grounded in a utilitarian frame-  
 49 work. However, adopting alternative objectives—such as ex post egalitarianism—can  
 50 lead to markedly different conclusions. Positive models that examine the political  
 51 economy of LTC, while less common than those focusing on optimal policy design,  
 52 offer valuable insights into the political feasibility of public schemes. These models  
 53 often uncover some degree of political support for social LTC programs, although  
 54 such support may be undermined by factors like family solidarity, behavioral biases,  
 55 or the availability of more actuarially fair private insurance.

56 This chapter takes an analytical approach, distinguishing it from the preceding  
 57 chapters. We present several normative models of social long-term care (LTC) insur-  
 58 ance, each designed to identify optimal policy instruments—taxes, subsidies, and  
 59 benefits—that maximize a utilitarian welfare function while accounting for individ-  
 60 ual behavioral responses. Our modeling framework adopts a Stackelberg strategic  
 61 game structure in which the state serves as the leader, making initial policy deci-  
 62 sions, while families respond sequentially as followers. We employ either linear or  
 63 non-linear policy instruments depending on the specific case under examination.  
 64 The framework operates under conditions of asymmetric information. Following  
 65 standard assumptions in the literature, the government cannot observe individual  
 66 characteristics such as survival probability, dependency risk, or labor productivity  
 67 when designing policy. Instead, it must rely on observable actions including earn-  
 68 ings, saving behavior, insurance purchases, public benefit claims, and care provision  
 69 levels. This information constraint places the analysis in a second-best setting, con-  
 70 trasting with the first-best scenario where the government would possess complete  
 71 information about individual characteristics and choices. The chapter ends with a  
 72 comprehensive list of notations used throughout the analysis.

## 4.1 Social Insurance Without the Family

We first present a model demonstrating that social insurance might be desirable for redistributive purposes even when income taxation is available.<sup>1</sup> The reason is that under some plausible assumptions, social insurance does not entail distortions while redistributive income taxation does.

### 4.1.1 Individual's Problem

Consider a two-period model, where individuals work and save in the first period. Individuals are distinguished according to three characteristics: wage (earning ability)  $w_i$ , the probability to be alive in the second period,  $\phi_i$ , and the probability  $\pi_i$  of becoming disabled in the second period. An individual of type  $i$  has a lifetime expected utility given by

$$U_i = u(c_i - v(l_i)) + (1 - \phi_i)\pi_i u(d_i) + \phi_i\pi_i H(m_i)$$

where  $c_i$  denotes the first-period consumption;  $d_i$  represents the second-period consumption if healthy, while  $m_i$  denotes LTC expenditures in case of dependence. The disutility of labor  $l_i$  is given by the convex function  $v(l_i)$ . The utility functions  $u(\cdot)$  and  $H(\cdot)$  are assumed to be strictly concave with  $u(z) > H(z)$ . This latter inequality implies that more resources are needed so as the disabled reach the same level of utility as the healthy elderly. Throughout most of this chapter, we assume zero interest rate and no time preference without loss of generality. Earnings in the first period is devoted to consumption, saving, and LTC insurance premium. We assume quasi linearity of the disutility of labor, such that net consumption is equal to  $x_i = c_i - v(l_i)$ . Private saving,  $s_i$ , is invested in a perfect annuity market so that we have  $d_i = s_i/\phi_i$ . Assuming no loading cost, an insurance premium  $I_i$  yields a benefit  $I_i/\phi_i\pi_i$  to the disabled elderly, whose LTC spending thus amounts to  $m_i = s_i/\phi_i + I_i/\phi_i\pi_i$ . We can now write the lifetime utility to be maximized as:

$$U_i = u(w_i l_i - s_i - I_i - v(l_i)) + (1 - \phi_i)\pi_i u(s_i/\phi_i + I_i/\pi_i\phi_i) + \phi_i\pi_i H(s_i/\phi_i + I_i/\pi_i\phi_i)$$

Assuming interior solutions, the FOCs are:

$$v'(l_i) = w_i; u'(x_i) = u'(d_i) = H'(m_i)$$

<sup>1</sup> See Rochet (1991), Cremer and Pestieau (1996, 2014).

103 At this point, a remark on the function  $H(m)$  is in order. We assume that a dependent  
 104 individual essentially consumes “care” and that his utility function is state dependent.  
 105 Implicitly, we assume a state of severe dependence due to a cognitive impairment  
 106 (like Alzheimer’s disease) that in general leads to institutionalization. We realize that  
 107 in a state of light dependence, it would make sense to have a utility function with  
 108 two arguments, standard consumption and care, like it is usual in health economics.  
 109 In those models, the substitutability between the two arguments is a crucial matter.  
 110 Ideally, we would like to introduce different levels and types of dependency. We do  
 111 that below.

### 112 4.1.2 Social LTC Benefits

113 With the linear tax specification adopted here, we have three instruments: a (uniform)  
 114 social LTC benefit,  $g$ , a demogrant<sup>2</sup>  $T$  and a proportional tax on wage income at rate  
 115  $\tau$ . We thus have:

$$116 \quad U_i = u(w_i l_i (1 - \tau) + T - s_i - I_i - v(l_i)) + (1 - \phi_i) \pi_i u(s_i / \phi_i + I_i / \pi_i \phi_i)$$

$$117 \quad + \phi_i \pi_i H(s_i / \phi_i + I_i / \pi_i \phi_i + g),$$

118 where the subscript  $i$  denotes the type of individuals that are characterized by the  
 119 triplets  $(w_i, \pi_i, \phi_i)$ . The relative number of individuals of type  $i$  is given by  $n_i$ . We  
 120 can then write the revenue constraint of the government:

$$121 \quad \sum n_i (\pi_i \phi_i g - \tau w_i l_i) + T = 0.$$

122 There are two types of insurance: private (actuarially fair) and social (redistributive).  
 123 Given risk aversion and actuarial fairness,<sup>3</sup> there will be full insurance. The question  
 124 is whether it is to be provided by the government or the market. We can now write the  
 125 problem of the social planner using the operator  $E$  so that  $Ez = \sum n_i z_i$ . It amounts  
 126 to maximize the following Lagrangian:

$$127 \quad \mathcal{L} = E [U - \mu (T + \pi \phi g - \tau w l)]$$

128 where  $\mu$  is the multiplier associated with the revenue constraint.

129 Using the envelope theorem and assuming again interior solutions except for  $g$ ,  
 130 we have:

<sup>2</sup> lump-sum transfer.

<sup>3</sup> This is a simplifying assumption as the loadings of private LTC insurance are actually substantial.

$$\frac{\partial \mathcal{L}}{\partial T} = Eu'(x) - \mu = 0 \quad (4.1)$$

$$\frac{\partial \mathcal{L}}{\partial \tau} = E \left[ -u'(x)wl + \mu \left( wl - \tau w \frac{\partial l}{\partial \tau} \right) \right] = 0 \quad (4.2)$$

$$\frac{\partial \mathcal{L}}{\partial g} = EH'(m)\pi\phi - \mu E\pi\phi \quad (4.3)$$

Combining, (4.1) and (4.3), we obtain:

$$\frac{\partial \mathcal{L}}{\partial g} = Eu'(x)\pi\phi - Eu'(x)E\pi\phi = cov(u'(x), \pi\phi) \quad (4.4)$$

According to Eq. (4.4),  $\frac{\partial \mathcal{L}}{\partial g} > 0$  as long as the covariance between  $u'(x)$  and  $\pi\phi$  is positive. This is indeed the case as we know that  $x$  is positively correlated with  $w$  and we learn from Lefèbvre et al. (2025) that the probability of being dependent decreases with income.

Combining the FOCs (4.1) and (4.2), we obtain the compensated effect of the tax on welfare:

$$\frac{\partial \mathcal{L}}{\partial \tau} + \frac{\partial \mathcal{L}}{\partial T} Ewl = -E[u'(x)wl] + Eu'(x)Ewl + \mu \tau Ew \frac{\partial l}{\partial \tau} = 0,$$

where  $\frac{dA}{d\tau} = Ewl$  denotes the amount of lump sum transfer obtained from an increase in taxation.

This can be rewritten as:

$$\tau = \frac{-cov(u'(x), wl)}{-\mu Ew \frac{\partial l}{\partial \tau}} > 0, \quad (4.5)$$

where  $\frac{\partial l}{\partial \tau} < 0$  denotes the effect of the tax on the labor supply. This effect is negative. The numerator of the tax formula (4.4) represents the equity effect of the tax ( $cov(u'(x), wl) < 0$ ). The size of the equity effect depends on the wage inequality and on the concavity of the utility function. As to the denominator, it reflects the efficiency effect. If the labor supply is inelastic, in other words, if the tax does not much modify the individual behavior, the tax will tend to be high. This result rests on the assumption of an interior solution for  $I_i$ . This assumption is not necessarily met. We can expect that if  $g$  is generous enough, low-income individuals would not purchase LTC insurance.



### 4.1.3 Extensions

We now turn to a number of extensions of this basic model.

#### 4.1.3.1 Myopia and Loading Costs

In the above model, disability risk was assumed to be correctly perceived. As we saw in the section devoted to the LTC insurance puzzle, there is some evidence that this is far from being the case. In that respect, Cremer and Roeder (2013)<sup>4</sup> examine scenarios where individuals underestimate their future disability needs. They model individual differences in productivity, survival probability, disability risk, and awareness of these risks. While productivity is positively correlated with survival rates and negatively with dependency, the net probability of becoming dependent doesn't necessarily decrease with higher productivity. In optimal scenarios, subsidizing private LTC insurance or implementing social insurance could mitigate these issues. The choice depends on the actuarial fairness of private insurance; unfair private markets make a stronger case for social insurance, which, however, can be regressively distributed and thus less effective in non-ideal conditions.

#### 4.1.3.2 Pensions Versus LTC Benefits

Thus far, the pension dimension has been overlooked. Yet pensions and LTC benefits represent the two principal public programs targeting the elderly, and they often compete for limited public resources. We thus now extend the above model by introducing public pensions, keeping two types of uncertainty pertaining to mortality and disability. Individuals are distinguished by their productivity,  $w_i$ , their survival probability,  $\phi_i$ , and their disability risk,  $\pi_i$ . We consider a government that has to adopt two public policies: a LTC benefit as above and a flat rate pension  $P$ . To study such a choice, we adapt the above model by modifying the revenue constraint:

$$E[\pi\phi g + \phi P + T - \tau w l] = 0.$$

and the individual utility:

$$U_i = u(w_i l_i (1 - \tau) + T - s_i - I_i - v(l_i)) + \phi_i (1 - \pi_i) u(s_i / \phi_i + I_i / \pi_i \phi_i + P) + \phi_i \pi_i H(s_i / \phi_i + I_i / \pi_i \phi_i + g + P)$$

Assuming interior solutions, we have:  $u'(x_i) = u'(d_i) = H'(m_i)$ .

<sup>4</sup> See also Cremer and Roeder (2017).

186 The problem for the government is thus to find the policy tools that maximize the  
187 following Lagrangian:

$$188 \quad \mathcal{L} = E [U - \mu (T + \pi \phi g + \phi P - \tau wl)]$$

189 Focusing on the FOCs with respect to the LTC benefits and the pension level,<sup>5</sup>  
190 we have:

$$191 \quad \frac{\partial \mathcal{L}}{\partial g} = EH'(m)\pi\phi - \mu E\pi\phi \quad (4.6)$$

$$192 \quad \frac{\partial \mathcal{L}}{\partial P} = E [u'(d)\phi (1 - \pi) + H'(m)\pi\phi] - \mu E\phi \quad (4.7)$$

194 Combining (4.6) and (4.7), we obtain the effect of increasing public LTC spending  
195 at the expense of public pension on social welfare:

$$196 \quad \frac{\partial \mathcal{L}}{\partial g} + \frac{\partial \mathcal{L}}{\partial P} \frac{E\pi\phi}{E\phi} = \frac{E\phi(1-\pi)}{E\phi} cov(u', \pi\phi) - \frac{E\pi\phi}{E\phi} cov(u', \phi(1-\pi)) > 0$$

197 The inequality sign comes from Lefèbvre et al. (2025) who show that there is a  
198 negative correlation between income and the risk of dependence and a positive one  
199 between income and the probability of being healthy in old age.

200 Nishimura and Pestieau (2022) delve into these comparative merits of social insur-  
201 ance for long-term care versus public pension systems in departing from the above  
202 interior solutions assumption that implies the possibility for the poor households to  
203 borrow against future social benefits. Their findings suggest that a utilitarian gov-  
204 ernment would prioritize LTC insurance due to its broad societal benefits, whereas  
205 a Rawlsian government's decision would hinge on the relative metrics of survival  
206 versus dependence risk among the less affluent compared to the population average.

207 Despite this finding, we observe a pronounced political preference for public  
208 pensions over long-term care insurance. This preference stems from several inter-  
209 connected factors embedded in electoral dynamics, institutional frameworks, and  
210 economic incentives. Pensions command broad political support because they bene-  
211 fit virtually all elderly citizens, while long-term care serves a smaller, more vulnerable  
212 population. Additionally, family support networks tend to be more robust for disabled  
213 parents than for healthy ones, further influencing policy priorities.

### 214 4.1.3.3 Types of Disability

215 LTC economists tend to consider dependence as a one-dimensional reality, whose  
216 only variability would be its severity. One would be more or less seriously dependent.  
217 In reality, there are different sources of old age dependence. Among these sources,

<sup>5</sup> We implicitly assume that  $T = 0$ .

one can cite age-related disabilities from chronic diseases such as pulmonary disease and diabetes, age-related loss of hearing, sight, and movement (arthritis), cognitive illnesses such as dementia and Alzheimer.

It is important to take into account this heterogeneity in the causes of dependence for two reasons. Health care and nursing can vary from one type to another. And social policy can also vary from one type to another. Using SHARE data, one can distinguish between forms of dependency and show how each of them is differently distributed across the income scale. On that basis, we develop a theoretical model of LTC social insurance that takes this distinction into account. Unlike the previous subsection, this model follows the non-linear approach of Atkinson and Stiglitz (1976).

We consider a society comprising two types of individuals, denoted  $i = 1, 2$  where each type is characterized by three parameters: productivity  $w_i$ , the probability  $\pi_{1i}$  of incurring a disability of category 1 that increases with  $w_i$  and the probability  $\pi_{2i}$  of incurring a disability of category 2 that is negatively correlated with  $w_i$ . We assume that  $w_1 < w_2$ . There is no uncertainty over the lifetime.

Individual utility is given by:

$$U_i = u(c_i) - v(l_i) + (1 - \pi_{1i} - \pi_{2i}) u(d_i) + \pi_{1i} H(m_{1i}) + \pi_{2i} V(m_{2i})$$

where  $c_i$  and  $d_i$  denote consumption in first and second period when healthy;  $l_i$  is labor supply. The variables  $m_{1i}$  and  $m_{2i}$  denote the long-term care needed in case of disability 1 and 2. The utility functions  $u(\cdot)$ ,  $V(\cdot)$ ,  $H(\cdot)$  are strictly concave and  $v(\cdot)$  strictly convex. We assume that both retirement and disability can be financed with actuarially fair insurance products. We posit that the social planner can observe earnings  $y_i = w_i l_i$ . Consumption spending  $d_i$  and LTC spending  $m_{1i}$  and  $m_{2i}$ . We write the lifetime utility function as:

$$U_i = u[y_i - \theta_y(y_i) - (1 - \pi_{1i} - \pi_{2i})(d_i + \theta_d(d_i))] - \pi_{1i}(m_{1i} + \theta_{1i}(m_{1i})) - \pi_{2i}(m_{2i} + \theta_{2i}(m_{2i})) + (1 - \pi_{1i} - \pi_{2i})u(d_i) + \pi_{1i}H(m_{1i}) + \pi_{2i}V(m_{2i}) - v(y_i/w_i)$$

where the functions  $\theta_z(z_i)$  denote the non-linear tax (or subsidy) on  $z_i$  with  $z_i = y_i, d_i, m_{1i}, m_{2i}$ .

From the FOCs for the individual utility maximization, we obtain the following rates of substitution that may include some distortions.

$$\frac{v'(l_i)}{u'(c_i)} = w_i(1 - \theta'_y(y_i))$$

$$\frac{u'(d_i)}{u'(c_i)} = 1 + \theta'_d(d_i)$$

$$\frac{H'(m_{1i})}{u'(c_i)} = 1 + \theta'_{1i}(m_{1i})$$

$$\frac{V'(m_{2i})}{u'(c_i)} = 1 + \theta'_{2i}(m_{2i})$$

In these expressions,  $\theta'_z(z_i)$  denotes the marginal tax on  $z_i = y_i, d_i, m_{1i}, m_{2i}$ .

We want to maximize the utilitarian social welfare  $\sum n_i U_i$  subject to the resource constraint:

$$\sum n_i [c_i + (1 - \pi_{1i} - \pi_{2i}) d_i + \pi_{1i} m_{1i} + \pi_{2i} m_{2i} - y_i] = 0,$$

where  $n_i$  denotes the relative number of type  $i$ 's individuals.

We assume that individuals of type 2 will be tempted to mimic individuals of type 1 so that we have the following self-selection constraint:

$$u(c_2) - v(y_2/w_2) + (1 - \pi_{12} - \pi_{22}) u(d_2) + \pi_{12} H(m_{12}) + \pi_{22} V(m_{2H})$$

$$- u(c_1) + v(y_1/w_2) - (1 - \pi_{12} - \pi_{22}) u(d_1) - \pi_{12} H(m_{11}) + \pi_{22} V(m_{21}) = 0.$$

Denoting  $\mu$ , the multiplier associated with the resource constraint and  $\lambda$ , the multiplier associated with the self-selection constraint, we write the Lagrangian expression to be maximized by the social planner as:

$$\begin{aligned} \mathcal{L} = & \sum n_i [u(x_i) - v(y_i/w_i) + (1 - \pi_{1i} - \pi_{2i}) u(d_i) + \pi_{1i} H(m_{1i}) + \pi_{2i} V(m_{2i})] \\ & - \mu \sum n_i (c_i + (1 - \pi_{1i} - \pi_{2i}) d_i + \pi_{1i} m_{1i} + \pi_{2i} m_{2i} - y_i) \\ & + \lambda [U_2 - u(c_1) + v(y_1/w_2) - (1 - \pi_{12} - \pi_{22}) u(d_1) - \pi_{12} H(m_{11}) + \pi_{22} V(m_{21})] \end{aligned}$$

The FOCs are given by:

$$u'(c_2) [n_2 + \lambda] - \mu n_2 = 0$$

$$u'(d_2) [n_2 + \lambda] - \mu n_2 = 0$$

$$H'(m_{12}) [n_2 + \lambda] - \mu n_2 = 0$$

$$V'(m_{22}) [n_2 + \lambda] - \mu n_2 = 0$$

$$-v'(y_2/w_2)[n_2 + \lambda] + \mu n_2 w_2 = 0$$

$$[u'(c_1) - \mu]n_1 - \lambda u'(c_1) = 0$$

$$[u'(d_1) - \mu]n_1 - \lambda \frac{1 - \pi_{12} - \pi_{22}}{1 - \pi_{11} - \pi_{21}} u'(d_1) = 0$$

$$[H'(m_{11}) - \mu]n_1 - \lambda \frac{\pi_{12}}{\pi_{11}} H'(m_{11}) = 0$$

$$[V'(m_{21}) - \mu]n_1 - \lambda \frac{\pi_{22}}{\pi_{21}} V'(m_{21}) = 0$$

$$-\left[\frac{v'(y_1/w_1)}{w_1} - \mu\right]n_1 + \lambda \frac{v'(y_1/w_2)}{w_2} = 0$$

From the first five FOCs, one easily gets the no distortion at the top result:

$$u'(c_2) = \frac{v'(y_2/w_2)}{w_2} = u'(d_2) = H'(m_{12}) = V'(m_{22}) = \frac{\mu n_2}{n_2 + \lambda}$$

As to the type 1's individuals, we can rewrite their FOCs as follows:

$$\frac{u'(d_1)}{u'(c_1)} = \frac{n_1 - \lambda}{n_1 - \lambda \frac{1 - \pi_{12} - \pi_{22}}{1 - \pi_{11} - \pi_{21}}} = 1 + \theta'_d(d_1) > 1 \quad (4.8)$$

$$\frac{H'(m_{11})}{u'(c_1)} = \frac{n_1 - \lambda}{n_1 - \lambda \frac{\pi_{12}}{\pi_{11}}} = 1 + \theta'_{11}(m_{11}) > 1 \quad (4.9)$$

$$\frac{V'(m_{21})}{u'(c_1)} = \frac{n_1 - \lambda}{n_1 - \lambda \frac{\pi_{22}}{\pi_{21}}} 1 + \theta'_{21}(m_{21}) < 1 \quad (4.10)$$

$$\frac{v'(y_1/w_1)}{u'(c_1)w_1} = 1 + \frac{\lambda}{\mu n_1} \left[ \frac{v'(y_1/w_2)}{w_2} - \frac{v'(y_1/w_1)}{w_1} \right] = 1 - \theta'_y(y_1) < 1 \quad (4.11)$$

We signed the equations so that we have a tax on  $d_1$  and on  $m_{11}$ , a subsidy on  $m_{21}$  and a tax on  $y_1$ . The tax on  $d_1$  and on  $m_{11}$  can be explained by the assumption that the rich live longer in good health and suffer from type 1 dependence more than the poor. The subsidy on  $m_{21}$  comes from the fact that  $\pi_{22} < \pi_{21}$ . Finally, the tax on labor is standard.

#### 4.1.3.4 Social Criterion

The literature on long-term care (LTC) public policy predominantly adopts a utilitarian framework, whereby the social planner seeks to maximize the sum of individual expected utilities. Recently, scholars have challenged this approach, arguing for compensation to those who become disabled through no fault of their own.<sup>6</sup> A key limitation of utilitarianism emerges when examining lifetime uncertainty. Consider two individuals, each with identical initial endowment  $w$ , but differing lifespans: one lives for a single period, the other for two periods. Assuming a zero interest rate and no time preference, the utilitarian planner aims at maximizing the sum of lifetime utilities, represented as:

$$u(c_1) + u(d_1) + u(c_2)$$

subject to the resource constraint  $c_1 + d_1 + c_2 = 2w$ , where  $c_i$  and  $d_i$  denote first and second-period consumption, respectively.

The utilitarian solution reveals that  $c_1 = d_1 = c_2 = 2w/3$ . This results in the first individual receiving twice as much consumption as the second individual. This outcome highlights a critical flaw: the utilitarian approach fails to account for fairness in distribution when lifetimes differ. Formally, with the ex post approach, the allocation of consumption levels is determined by the equation:

$$u(c_1) + u(d_1) = u(c_2)$$

that implies  $c_2 > c_1 = d_1$ .

Turning to the issue of disability in old age, if one adopts the utilitarian criterion, the disabled elderly should receive more resources than the autonomous elderly, since the former exhibits a higher capacity to convert resources into well-being, granted that  $u'(z) < H'(z)$ . However, this does not insure that this will compensate for the disability. On the contrary, under the ex post egalitarian social criterion, more resources should be allocated to the dependent elderly than to the autonomous elderly, so as to compensate him/her for dependency. The postulated normative criterion has also crucial consequences for the overall shape of consumption profiles.

To emphasize the difference between the two approaches, we will take the case where the marginal utility of the disabled elderly is lower than that of the healthy elderly.

Assume identical individuals with utility for consumption  $u(c)$  and  $u(d)$  and utility for LTC  $H(m)$ , both being strictly concave, fulfilling Inada conditions and such that

$$u(x) > H(x); u'(x) > H'(m)$$

<sup>6</sup> Leroux et al. (2021).

330 The lifetime expected utility of the individual is

$$331 \quad U = u(w - s - I) + (1 - \pi)u(s) + \pi H(s + I/\pi),$$

332 where we assume a zero interest rate.

333 The FOCs are given by

$$334 \quad \frac{\partial U}{\partial s} = -u'(c) + (1 - \pi)u'(s) + \pi H'(s + I/\pi) \quad (4.12)$$

$$335 \quad \frac{\partial U}{\partial I} = -u'(c) + H'(s + I/\pi) \quad (4.13)$$

336 Given our assumptions, (4.12) is binding and (4.13) is not. This means that not  
337 only the individuals will not purchase an actuarially fair insurance but that a utilitarian  
338 government will not provide such an insurance.

339 Let us now assume that the government wants to achieve an ex post equality  
340 between the utilities of the healthy elderly and that of the disabled elderly. It is clear  
341 that such equality is not obtained in the laissez faire since:

$$342 \quad U^H = u(w - s) + u(s) > U^D = u(w - s) + H(s)$$

343 To do so, it is going to provide a LTC benefit  $g$  such that:

$$344 \quad H(s + g) = u(s) \quad (4.14)$$

345 where  $\tau = \pi g$  is a tax levied ex ante in the first period. The problem of the individual  
346 ex ante is to find the value of  $s$  that maximizes:

$$347 \quad U = u(w - s - \tau) + (1 - \pi)u(s) + \pi H(s + g)$$

348 The FOC is the same as (4.12). Combining (4.12) and (4.14), we get a positive  
349 value for the public LTC benefit  $g^*$ . We clearly have that a social insurance for LTC  
350 is desirable with the ex post egalitarianism objective.

351 The paper of Leroux et al. (2021) revisits the design of optimal LTC insurance in  
352 comparing the utilitarian social criterion with two egalitarian social criteria—ex ante  
353 and ex post egalitarianism—which give priority to the worst-off either in expected or  
354 in realized terms. They show that the optimal second-best insurance under the ex-ante  
355 egalitarian criterion involves, in comparison to utilitarianism, higher LTC and pension  
356 benefits and higher tax rates on savings and on labor earnings. In comparison to ex  
357 ante egalitarianism, ex post egalitarianism involves lower LTC and pension benefits,  
358 a higher tax on savings, and a lower tax rate on labor earnings, in order to increase  
359 consumption of the young, who include persons who will turn out to be short-lived.  
360 In their analysis, living a longer life with disability is preferred to dying prematurely.

361 We can now summarize this section as follows. When individuals differ only in  
 362 their risk of dependency, the ex-post egalitarian criterion favors dependent individ-  
 363 uals more than the utilitarian criterion. When differences involve both the risk of  
 364 dependency and the probability of premature death, this result holds if premature  
 365 death is perceived as a preferable outcome to dependency. However, if this is not  
 366 the case, the egalitarian criterion prioritizes individuals facing premature death but  
 367 does not grant dependent individuals more favorable treatment than the utilitarian  
 368 criterion would.

369 If disabled elderly individuals have lower marginal utility than their healthy coun-  
 370 terparts, this provides a compelling explanation for the underdeveloped long-term  
 371 care (LTC) insurance market. Under this scenario, even a utilitarian government  
 372 might reasonably conclude that providing such insurance is unnecessary. However,  
 373 if the government prioritizes ex post utility equalization, a strong case emerges for  
 374 social insurance coverage of LTC.

## 375 4.2 Social Insurance with Family Assistance

### 376 4.2.1 Basic Model

377 As discussed in the subsection on the long-term care insurance puzzle, one key reason  
 378 for the near absence of private insurance in most countries is the expectation that  
 379 children will provide assistance in case of disability in old age. However, as we  
 380 will now explore, private insurance does not operate in isolation—it can influence  
 381 the level of informal care provided by children and shape public policy, particularly  
 382 when it is actuarially fair. The basic model used involves parent-child families, where  
 383 children's contributions to their elderly parents' care depend on their individual  
 384 market productivity and their degree of altruism. Families differ in the levels of  
 385 wages  $w_i$  and  $\omega_i$  of the parent and the child and the disability risk  $\pi_i$ . Parent's  
 386 lifetime utility can be written as:

$$387 U_i^P = u(w_i(1 - \tau)l_i - s_i - I_i - v(l_i)) + (1 - \pi_i)u(s_i) + \pi_i H(a_i, I_i/\pi_i + s_i + g)$$

388 where  $H(a, m)$  is the LTC utility that depends on informal care provided by children,  
 389  $a_i$ , and formal cares  $m_i = I_i/\pi_i + s_i + g$ , financed by the actuarially fair insurance  
 390 scheme  $I_i$ , saving  $s_i$  and public LTC benefit,  $g$ . LTC public benefits are financed by  
 391 a payroll tax paid by the parents when young. A word on the LTC utility function  
 392  $H(a, m)$  is in order. In the theoretical literature, this utility has most often just an  
 393 argument, which means that formal and informal care are perfect substitutes. Another  
 394 specification consists in distinguishing between standard consumption  $c$  and health  
 395 status  $h$ , in which case we have  $H(c, h)$ . This specification is often used in health  
 396 economics. In this section, we deliberately distinguish between formal and informal

397 care and focus on whether these two types of care are substitutes or complements.  
 398 To simplify the presentation, we assume zero interest rate and no time preference.

399 The timing of the game is the following:

- 400 1. The government chooses the tax rate and the benefit level that maximize the  
 401 parents' welfare.
- 402 2. Parents choose their labor supply, their savings, and the LTC insurance premium,  
 403 if any.
- 404 3. Children help their parents in case of disability.

405 **Child's problem** As standard, we proceed backward and thus look first at the  
 406 child problem. The child's utility depends on whether the parent is dependent or not.  
 407 It can be written as:

- 408 • in case of healthy parent:  $U_i^c = u(d_i) = u(\omega_i)$
- 409 • in case of disabled parent:  $U_i^c = u(d_i) + \beta H(a_i, m_i) = u(\omega_i(1 - a_i)) +$   
 410  $\beta H(a_i, m_i)$ ,

411 where  $\beta$  denotes the degree of altruism and  $m_i = I_i/\pi_i + s_i + g$  denotes formal care.

412 When the parent is healthy, the child consumes his/her earning  $\omega_i$ . In case of loss  
 413 of autonomy, he/she devotes a fraction of time  $a_i$  to caring. The FOC that defines the  
 414 optimal  $a_i$  is simply

$$415 \quad \Delta = -u'(d_i)\omega_i + \beta H_1(a_i, m_i) = 0.$$

416 From this condition, we obtain a supply function for caring time:  $a_i = a(m_i; \beta, \omega_i)$ .  
 417 Differentiating the above FOC, we get:

$$418 \quad \frac{\partial a_i}{\partial m_i} = \frac{\beta H_{12}}{-\Delta_{a_i}} \leq 0 \Leftrightarrow H_{12} \leq 0.$$

419 Note that in the separable case where  $H_{12} = 0$ , elder care would only depend on  
 420  $\omega_i$  and  $\beta$ . In case of complementarity, elder care increases with  $m_i$  and in case of  
 421 substitutability, we have some crowding out. We might be interested by the effect of  
 422  $\omega_i$  on  $a_i$ . This can be obtained by differentiating the above FOC:

$$423 \quad \frac{da_i}{d\omega_i} = \frac{u'(d_i)[R_R(d_i) - 1]}{-\Delta_{a_i}}$$

424 In other words, the effect of  $\omega_i$  on  $a_i$  is positive or negative depending on whether  
 425 the coefficient of relative risk aversion is higher or lower than 1. Here, we posit that  
 426 the relative risk aversion coefficient is as well as the distribution of children's wages  
 427 are such that they have a small impact on informal care.

428 Throughout this analysis, we assume that children care only for their disabled  
 429 parents out of altruism, meaning they do not provide assistance when their parents  
 430 are healthy. Additionally, we intentionally selected altruism as the primary motive

431 for caregiving. An alternative explanation could be the influence of social norms, in  
432 which case informal care would remain independent of the variable  $m_i$ .<sup>7</sup>

433 **Parent's problem** Before knowing his/her health status, the parent chooses  $l_i$ ,  $s_i$   
434 and  $I_i$  so as to maximize lifetime expected utility  $U_i^P$  subject to the caring function  
435  $a(m_i; \beta, \omega_i)$ .

436 Parent's lifetime utility can be written as:

$$437 U_i^P = u(w_i(1 - \tau)l_i - s_i - I_i - v(l_i)) + (1 - \pi_i)u(s_i) + \pi_i H(a_i, I_i/\pi_i + s_i + g)$$

438 The FOCs are:

$$439 w_i(1 - \tau) - v'(l_i) = 0$$

$$440 - u'(c_i) + (1 - \pi_i)u'(s_i) + \pi_i H_2(a_i, m_i) + \pi_i H_1(a_i, m_i) \frac{\partial a_i}{\partial s_i} = 0$$

$$442 - u'(c_i) + H_2(a_i, m_i) + \pi_i H_1(a_i, m_i) \frac{\partial a_i}{\partial I_i} \leq 0.$$

443 where  $\frac{\partial a_i}{\partial I_i} = \frac{\partial a_i}{\partial m_i} \frac{1}{\pi_i}$  and  $\frac{\partial a_i}{\partial s_i} = \frac{\partial a_i}{\partial I_i} = \frac{\partial a_i}{\partial g} = \frac{\partial a_i}{\partial m_i}$ . Note that granted that the Inada con-  
444 ditions apply to  $u(d)$ , the FOC with respect to  $s$  is always interior.

445 In case of interior solution with  $I_i > 0$ , we have:

$$446 - u'(c_i) + H_2(a_i, m_i) + \pi_i H_1(a_i, m_i) \frac{\partial a_i}{\partial I_i} = 0; u'(c_i) = u'(s_i).$$

447 Otherwise, when  $I_i = 0$ , we have

$$448 - u'(c_i) + H_2(a_i, m_i) + \pi_i H_1(a_i, m_i) \frac{\partial a_i}{\partial I_i} < 0.$$

449 We will consider those two cases.

450 **Government's problem**

451 **Interior Solution**

452 We now turn to the social welfare maximization when  $I_i > 0$ . We posit that the  
453 government is only concerned by the welfare of the elderly generation. We write the  
454 following Lagrangian to be maximized:

$$455 \mathcal{L} = E\{u(w(1 - \tau)l - s - I - v(l)) + (1 - \pi)u(s) + \pi H(a(\cdot), I/\pi + s + g)\}$$

$$456 + \mu [\tau wl - \pi g],$$

<sup>7</sup> Klimaviciute et al. (2017).

457 where  $Ez = \sum n_i z_i$  and  $\mu$  denotes the multiplier associated with the revenue con-  
458 straint.

459 We obtain the FOCs:

$$460 \quad \frac{\partial \mathcal{L}}{\partial g} = E \left[ (-u'(c) + (1 - \pi)u'(d) + \pi H_2) \frac{\partial s}{\partial g} + (-u'(c_i) + H_2) \frac{\partial I}{\partial g} + \pi H_2 \right. \\ 461 \quad \left. + \pi H_1 \frac{da}{dg} - \mu \pi \right] = 0$$

$$462 \quad \frac{\partial \mathcal{L}}{\partial \tau} = -E \left[ u'(c)wl - \mu \left( wl + \tau w \frac{\partial l}{\partial \tau} \right) \right] = 0.$$

465 Using the FOCs of the parent:

$$466 \quad \frac{\partial \mathcal{L}}{\partial g} = E \left[ -\pi H_1 \left[ \frac{\partial a}{\partial s} \frac{\partial s}{\partial g} + \frac{\partial a}{\partial I} \frac{\partial I}{\partial g} \right] + \pi H_2 + \pi H_1 \frac{da}{dg} - \mu \pi \right] = 0$$

467 or

$$468 \quad \frac{\partial \mathcal{L}}{\partial g} = E \left[ \pi H_2 + \pi H_1 \frac{\partial a}{\partial g} - \mu \pi \right] = 0$$

469 where we have used the equality:  $\frac{da_i}{dg} = \frac{\partial a_i}{\partial m_i} \left[ 1 + \frac{\partial m_i}{\partial s_i} \frac{\partial s_i}{\partial g} + \frac{\partial m_i}{\partial I_i} \frac{\partial I_i}{\partial g} \frac{1}{\pi} \right]$ .

470 Combining those two FOCs, we obtain the compensated effect of the tax denoted

$$471 \quad \frac{\partial \mathcal{L}^C}{\partial \tau} = \frac{\partial \mathcal{L}^C}{\partial \tau} + \frac{dg}{d\tau} \frac{\partial \mathcal{L}}{\partial g} :$$

$$472 \quad \frac{\partial \mathcal{L}^C}{\partial \tau} = -Eu'(c)wl + E\pi H_2 \frac{Ewl}{E\pi} + E\pi H_1 \frac{\partial a}{\partial m} \frac{Ewl}{E\pi} + \mu \tau Ew \frac{\partial l}{\partial \tau} = 0$$

473 This can be rewritten as:

$$474 \quad \frac{\partial \mathcal{L}^C}{\partial \tau} = -Eu'(c)wl + E\pi H_2 \frac{Ewl}{E\pi} + E\pi (u'(c_i) - H_2) \frac{Ewl}{E\pi} + \mu \tau Ew \frac{\partial l}{\partial \tau} = 0,$$

475 or

$$476 \quad \frac{\partial \mathcal{L}^C}{\partial \tau} = -cov(u'(c), wl) + cov(u'(c), \pi) \frac{Ewl}{E\pi} + \mu \tau Ew \frac{\partial l}{\partial \tau} = 0.$$

477 And thus:

$$478 \quad \tau = \frac{-cov(u'(c), wl) + cov(u'(c), \pi) \frac{Ewl}{E\pi}}{-\mu Ew \frac{\partial l}{\partial \tau}}$$

479 The first covariance is clearly negative. Given that it is generally assumed that  
480 the risk of disability is negatively correlated with income, the second covariance is  
481 positive. We thus have that in case of interior solutions, family solidarity does not

482 affect public LTC insurance. In this case, private insurance neutralizes the insurance  
 483 role of the public scheme.

484 **LTC Insurance Unavailable**

485 Let us now assume that for the various reasons that are discussed within the issue  
 486 of the LTC insurance puzzle (see Pestieau and Ponthière (2012)),<sup>8</sup> such insurance  
 487 does not exist. The choice of the parent is thus reduced to  $l_i$  and  $s_i$  that are used to  
 488 maximize lifetime expected utility  $U_i^p$  subject to the caring function  $a(m_i; \beta, \omega_i)$ .

489 The problem of the government is expressed by the following Lagrangian to be  
 490 maximized:

$$491 \quad \mathcal{L} = E\{u(w(1 - \tau)l - s - v(l)) + (1 - \pi)u(s) + \pi H(a(\cdot), s + g)$$

$$492 \quad + \mu[\tau wl - \pi g]\}.$$

493 Interior solutions are obvious here and thus, we obtain the FOCs:

$$494 \quad \frac{\partial \mathcal{L}}{\partial g} = E\left[\pi H_1 \frac{\partial a}{\partial m} + \pi H_2 - \mu\pi\right] = 0$$

$$495 \quad \frac{\partial \mathcal{L}}{\partial \tau} = -E\left[u'(c)wl - \mu\left(wl + \tau w \frac{\partial l}{\partial \tau}\right)\right] = 0.$$

496 Combining those two FOCs, we obtain the compensated effect of the tax

$$497 \quad \frac{\partial \mathcal{L}^C}{\partial \tau} = -E\left[u'(c)wl - \pi H_2 \frac{Ewl}{E\pi} - \pi H_1 \frac{\partial a}{\partial m} \frac{Ewl}{E\pi} - \mu\tau w \frac{\partial l}{\partial \tau}\right] =$$

$$498 \quad -cov(u'(c), wl) + cov(\pi, H_2) \frac{Ewl}{E\pi} + EwlE[H_2 - u'(c)] +$$

$$499 \quad E\pi H_1 \frac{\partial a}{\partial m} \frac{Ewl}{E\pi} - \mu\tau Ew \frac{\partial l}{\partial \tau} = 0.$$

501 And thus:

$$502 \quad \tau = \frac{-cov(u'(c), wl) + cov(\pi, H_2) \frac{Ewl}{E\pi} + EwlE[H_2 - u'(c)] + E\pi H_1 \frac{\partial a}{\partial m} \frac{Ewl}{E\pi}}{-\mu Ew \frac{\partial l}{\partial \tau}}$$

<sup>8</sup> See also Pestieau (2026).

Author Proof

503 The first covariance is clearly negative, and the second is positive. The third term  
 504 is expected to be positive. Indeed, in the First Best, we have that  $H_2 - u'(c) = 0$ ,  
 505 which can be implemented with an actuarial fair private insurance. In the absence of  
 506 such insurance, the level of  $m$  is suboptimal. As to the last term of the denominator,  
 507 it is positive as long as  $H_{12} > 0$ . We thus have that family solidarity fosters public  
 508 spending in case of complementarity between  $a$  and  $m$ . In case of substitutability, it  
 509 depresses public spending.

#### 510 **4.2.2 Heterogeneity in Altruism and Productivity**

511 Jousten et al. (2005) examine a scenario involving families each made up of one young  
 512 person and one elderly dependent who lacks financial resources. They assume all  
 513 young individuals earning the same income while their levels of altruism vary. The  
 514 government does not observe the level of altruism. The study investigates the effects  
 515 of public long-term care interventions, including services like public nursing home  
 516 care combined with a lump-sum subsidy for children who finance home care for their  
 517 parents. The paper highlights how the government's inability to assess the level of  
 518 children's altruism necessitates maintaining a relatively low quality of public nursing  
 519 homes so as to avoid that altruistic children use the public facility for their disabled  
 520 parents. Additionally, the study assesses the welfare outcomes for different groups  
 521 within this framework.

522 In the above paper, children's wages were uniform and altruism differed across  
 523 children. Assuming instead uniform altruism and variable wages, Pestieau and Sato  
 524 (2008) explore a model involving parent-child families, where children's contribu-  
 525 tions to their elderly parents' care depend on their individual market productivity.  
 526 In a laissez-faire environment, altruistic children with lower productivity tend to  
 527 provide physical caregiving, while those with higher productivity provide financial  
 528 support. Introducing private LTC insurance changes the dynamics, as children with  
 529 intermediate productivity levels might opt for purchasing rather than providing direct  
 530 support. The study delves into optimal public policies, which include a linear tax on  
 531 children's earnings, a uniform subsidy for caregiving children, public nursing home  
 532 options, and subsidies for private insurance premiums. The paper finds that using  
 533 a combination of these tools, such as a high tax and subsidy rate, is particularly  
 534 effective in scenarios where children generally have lower productivity and parents  
 535 possess limited resources. It also highlights a robust case for public nursing services,  
 536 particularly when private LTC insurance is not sufficiently efficient.

#### 537 **4.2.3 Random Altruism**

538 When disabled parents rely on family members for care and assistance, various  
 539 life events can disrupt these support systems without warning. Let us cite the most

540 notable of these disruptions. Death of caregivers creates an immediate and often  
 541 permanent gap in support. When an adult child who provides daily assistance passes  
 542 away, the disabled parent may be left without their primary caregiver and emotional  
 543 support. Illness can affect caregivers limiting their ability to provide care. Migration  
 544 for employment, education, or personal reasons can physically separate caregivers  
 545 from those who need care. Economic hardship can reduce the caregiver's availability.  
 546 Finally, family disputes and relationship breakdowns can sever caregiving arrange-  
 547 ments.

548 These disruptions modify the design of public policy as we now see. The child's  
 549 problem is unchanged. We thus turn to the parent's problem.

550 **Parent's problem** Let us denote the uniform probability of informal care by  $\zeta$ .  
 551 This means that with a probability  $1 - \zeta$ , the disabled parent does not receive any  
 552 informal care ( $a = 0$ ).

553 The lifetime utility of the parent facing a probability  $\pi$  of becoming disabled and  
 554 a probability of getting aid from the child  $\zeta$  is the following

$$555 \quad U_i^p = u(w_i(1 - \tau)l_i - s_i - I_i - v(l_i)) + (1 - \pi)u(s_i)$$

$$556 \quad + \pi_i(1 - \zeta)H(0, I_i/\pi_i + s_i + g) + \pi_i\zeta H(a_i, I_i/\pi_i + s_i + g)$$

557 The FOCs are:

$$558 \quad w_i(1 - \tau) - v'(l_i) = 0$$

$$559 \quad -u'(c_i) + (1 - \pi_i)u'(s_i) + \pi_i\zeta \left[ H_2(a_i, m_i) + H_1(a_i, m_i) \frac{\partial a_i}{\partial m_i} \right]$$

$$560 \quad + \pi_i(1 - \zeta)H_2(0, m_i) = 0$$

$$561 \quad -u'(c_i) + \zeta \left[ H_2(a_i, m_i) + H_1(a_i, m_i) \frac{\partial a_i}{\partial m_i} \right] + (1 - \zeta)[H_2(0, m_i)] \leq 0.$$

562 **Government's problem** The problem of the government is to maximize the fol-  
 563 lowing Lagrangian:

$$564 \quad \mathcal{L} = E\{u(w(1 - \tau)l - s - I - v(l)) + (1 - \pi)u(s) + \pi(1 - \zeta)H(0, m)$$

$$565 \quad + \pi\zeta H(a, m) + \mu[\tau wl - \pi g]\}$$

$$1 + \zeta \left[ \pi H_2(a, m) + \pi H_1(a, m) \frac{da}{dg} \right] + (1 - \zeta) \pi H_2(0, m) - \mu \pi = 0,$$

Using the FOCs of the parent, we get the following FOCs:

$$\frac{\partial \mathcal{L}}{\partial g} = E \left[ \zeta \pi H_1(a, m) \frac{\partial a}{\partial g} + \pi \mathcal{E} H_2 - \mu \pi \right] = 0,$$

$$\frac{\partial \mathcal{L}}{\partial \tau} = -E \left[ u'(c)wl - \mu \left( wl + \tau w \frac{\partial l}{\partial \tau} \right) \right] = 0,$$

where  $\mathcal{E} H_2 = \zeta H_2(a, m) + (1 - \zeta) H_2(0, m)$  is the expected marginal utility of formal care.

We now combine those two equations to obtain:

$$\frac{\partial \mathcal{L}^C}{\partial \tau} = -E \left[ u'(c)wl - \pi \mathcal{E} H_2 \frac{Ewl}{E\pi} - \pi \zeta H_1(a, m) \frac{\partial a}{\partial m} \frac{Ewl}{E\pi} - \mu \tau w \frac{\partial l}{\partial \tau} \right]$$

$$= -cov(u'(c), wl) + \mathcal{E} cov(\pi, H_2) \frac{Ewl}{E\pi}$$

$$- Ewl [Eu'(c) - \mathcal{E} H_2] + \zeta E\pi H_1(a, m) \frac{\partial a}{\partial m} \frac{Ewl}{E\pi} - \mu \tau Ew \frac{\partial l}{\partial \tau} = 0,$$

where  $\mathcal{E} cov(\pi, H_2) = \zeta cov(\pi, H_2(a, m)) + (1 - \zeta) cov(\pi, H_2(0, m))$  is the expected value of the covariance between the disability risk and the marginal utility of formal care.

We distinguish two cases. If  $I > 0$ , from the FOC of the parent, we can rewrite this equation as:

$$\frac{\partial \mathcal{L}^C}{\partial \tau} = -cov(u'(c), wl) + cov(u'(c), \pi) \frac{Ewl}{E\pi} + \mu \tau Ew \frac{\partial l}{\partial \tau} = 0$$

And thus:

$$\tau = \frac{-cov(u'(c), wl) + cov(u'(c), \pi) \frac{Ewl}{E\pi}}{-\mu Ew \frac{\partial l}{\partial \tau}}$$

If instead,  $I = 0$ , we have

$$\tau = \frac{-cov(u'(c), wl) + \mathcal{E} cov(\pi, H_2) \frac{Ewl}{E\pi} + Ewl [Eu'(c) - \mathcal{E} H_2] + \zeta E\pi H_1(a, m) \frac{\partial a}{\partial m} \frac{Ewl}{E\pi}}{-\mu Ew \frac{\partial l}{\partial \tau}}.$$

591 To see the impact of  $\zeta$  on the level taxation [ $\tau(\zeta)$ ], we look at the two extreme  
 592 cases:

$$593 \quad \tau(0) = \frac{-cov(u'(c), wl) + cov(\pi, H_2(0, m)) \frac{Ewl}{E\pi}}{-\mu Ew \frac{\partial l}{\partial \tau}}$$

$$594 \quad \tau(1) = \frac{-cov(u'(c), wl) + cov(\pi, H_2(a, m)) \frac{Ewl}{E\pi} + E\pi H_1(a, m) \frac{\partial a}{\partial m} \frac{Ewl}{E\pi}}{-\mu Ew \frac{\partial l}{\partial \tau}}.$$

596 It appears that when  $H_{12} = 0$ , the two formulas,  $\tau(0)$  and  $\tau(1)$ , are very similar.  
 597 When  $H_{12} > 0$ , the level of public spending seems to benefit from an increase in  $\zeta$ ,  
 598 whereas when  $H_{12} < 0$ , we observe the opposite effect. This is pretty intuitive. In  
 599 case of separability, there is no interaction between  $g$  and  $a$ . Family solidarity thus  
 600 has a negligible impact on the desired level of public spending. In case of strong  
 601 complementarity between  $g$  and  $a$ , there is a clear link between formal and informal  
 602 care. An increase in  $a$  makes public spending more attractive. Finally, in case of  
 603 strong substitutability between  $a$  and  $g$ , an increase in family solidarity crowds out  
 604 formal care and thus discourages public spending.

605 The risk of default of informal care has no impact on the level of social LTC  
 606 spending when every individual purchases private insurance. In case private insurance  
 607 is not available, the incidence depends on the sign of  $H_{12}$ . In case of complementarity,  
 608 family solidarity fosters public spending. In case of substitutability, it discourages it.

609 In the model discussed above, public benefits can be supplemented by insurance  
 610 compensations and private savings but remain distinct from informal care. Much  
 611 of the theoretical research on uncertainty in informal care assumes that informal  
 612 and formal care are perfect substitutes while recognizing that public LTC programs  
 613 generally follow one of the following two models of policy. The opting-out (OO)  
 614 policy provides public LTC benefits but prohibits individuals from supplementing  
 615 them with personal funds, meaning those who seek higher-quality care must forgo  
 616 public support entirely. In contrast, the topping-up (TU) policy allows individuals  
 617 to enhance public LTC benefits with private resources. Several notable contributions  
 618 have shaped this field, including studies by Cremer et al. (2013, 2017), Canta et  
 619 al. (2020) and Canta and Cremer (2021). Cremer et al. (2013) introduce a model  
 620 in which the likelihood of children providing care is endogenous, shaped by the  
 621 time and effort parents invest in child-rearing. Subsequent papers take a different  
 622 approach, assuming this probability to be exogenous. In these later works, children's  
 623 altruism is initially treated as a binary trait but is later refined by Canta et al. (2020)  
 624 into a continuous spectrum of altruistic behaviors. Most of the literature focuses on  
 625 individuals with identical characteristics, though Cremer et al. (2013) also consider  
 626 heterogeneity among agents.

627 Cremer et al. (2013) analyze an OO model in which public LTC benefits entirely  
 628 exclude the possibility of self-insurance or familial assistance. Building on this, Cre-  
 629 mer et al. (2017) examine a TU scheme, allowing for supplementary care from family  
 630 or the market alongside public benefits. Canta et al. (2020) introduce an opting-out-  
 631 cum-transfers (OC) model, where individuals can choose between standalone public

632 care or a combination of monetary transfers and private care. Further advancing this  
 633 discussion, Canta and Cremer (2021) explore non-linear policies that adjust public  
 634 LTC benefits based on observable levels of informal care, suggesting that more flex-  
 635 ible policies may be more effective. The effectiveness of these policies varies under  
 636 different conditions.

637 Cremer et al. (2017) and Canta et al. (2020) argue that the TU scheme generally  
 638 cannot outperform private insurance unless the private market is actuarially unfair.  
 639 Conversely, the OO and OC models may be more effective under certain conditions  
 640 by protecting individuals against the absence of informal care. However, there is no  
 641 definitive ranking between the TU and OO models; each has its advantages depending  
 642 on the context. Canta and Cremer (2021) conclude that the optimal policy should be  
 643 non-linear, increasing LTC benefits in proportion to the level of informal care rather  
 644 than applying rigid, binary distinctions. These insights highlight the complexity of  
 645 LTC policy design in the presence of uncertain altruism, emphasizing the importance  
 646 of adaptable solutions that account for varying levels of family support.

647 More recently, Cremer & Gahvari extend this analysis within an overlapping-  
 648 generations framework, considering steady-state equilibria under both full and asym-  
 649 metric information. In their model, children's altruism is shaped by the time and  
 650 attention they received in childhood. One of their key findings is that when public  
 651 LTC assistance carries no stigma, OO policies tend to be more cost-effective than  
 652 TU policies in both first- and second-best settings. Their work reinforces the idea  
 653 that policy effectiveness depends on broader social and behavioral factors, further  
 654 complicating the debate on optimal LTC provision.

### 655 4.3 Social LTC Policy and Bequests

656 Bequests and dependence in old age are closely intertwined for several reasons. In  
 657 societies lacking public or private long-term care insurance, children of parents who  
 658 endure prolonged disability receive smaller inheritances compared to those whose  
 659 parents remain healthy until the end of their lives. This disparity suggests that funding  
 660 LTC insurance through an inheritance tax could be beneficial. Moreover, the low  
 661 subscription rate to private LTC insurance is often cited as evidence against altruistic  
 662 bequest motives. The argument is that not purchasing insurance exposes potential  
 663 bequests to significant risk, indicating a lack of concern for future heirs. However,  
 664 research by Lockwood (2018) challenges this notion. He demonstrates that bequest  
 665 motives actually lead to increased savings and reduced purchases of LTC insurance.  
 666 According to Lockwood, bequests are intentional, whether they result from a healthy  
 667 life or an early death, which influences financial behavior accordingly.

668 To illustrate the link between public LTC and inheritance taxation, we present a  
 669 simple model. We consider individuals who live for two periods. They only differ  
 670 by their productivity  $w_i$ . Consumption in period 1 is denoted by  $c_i$ , consumption in  
 671 period 2 if healthy is denoted  $d_i$  and LTC in case of disability is denoted  $m_i$ . They  
 672 work 1 unit of time in period 1. Moreover, at the end of period 2, they may leave

673 bequests motivated by joy of giving. Bequests in case of good health are denoted  $b_i$ .  
 674 In case of disability, they cannot afford to leave any bequest. Their preferences can  
 675 be described by the lifetime expected utility:

$$676 \quad U_i = u(c_i) + [\pi H(m_i) + (1 - \pi) (u(d_i) + v(b_i))]$$

677 where  $\pi$  is the probability of dependence. Let  $s_i$  denote saving in period 1,  $\theta$  the tax  
 678 rate on bequests and  $g$  the public LTC benefit. We can rewrite the lifetime utility of  
 679 type  $i$  individuals as:

$$680 \quad U_i = u(w_i - s_i) + [\pi (H(s_i + g) + (1 - \pi) (u(s_i - b_i (1 + \theta)) + v(b_i)))]$$

681 where the rate of interest as well as the time preference are nil. The utility functions  
 682  $u(\cdot)$ ,  $v(\cdot)$ ,  $H(\cdot)$  are strictly concave. As usual, we assume that  $H'(z) > u'(z)$  and  
 683  $H(z) < u(z)$ .

684 The FOCs from the individual  $i$ 's utility maximization are:

$$685 \quad u'(c_i) = \pi H'(m_i) + (1 - \pi) u'(d_i); u'(d_i) (1 + \theta) = v'(b_i).$$

686

687 From these conditions, one obtains demand or supply functions for  $s_i$  and  $b_i$  with  $\theta$   
 688 and  $g$  as arguments.

689 The revenue constraint is simply:

$$690 \quad \sum n_i [\pi g - \theta (1 - \pi) b_i] = 0.$$

691 The Lagrangian expression to be maximized with respect to  $g$  and  $\theta$  is the fol-  
 692 lowing:

$$693 \quad \mathcal{L} = \sum n_i \{U_i - \mu [\pi g - \theta (1 - \pi) b_i]\},$$

694 where  $\mu$  is the multiplier associated with the revenue constraint.

695 Using the envelop theorem and the operator  $E$ , the FOCs are simply:

$$696 \quad \frac{\partial \mathcal{L}}{\partial \theta} = -E \{(1 - \pi) u'(d) b - \mu ((1 - \pi) b + \Delta_\theta)\}$$

697

$$698 \quad \frac{\partial \mathcal{L}}{\partial g} = E \{\pi H'(m) - \mu (\pi + \Delta_g)\}$$

699 where  $\Delta_z = \theta E [\pi (1 - \pi) \frac{\partial b}{\partial z}]$  for  $z = g, \theta$  denotes the indirect effect of policy  
 700 tools on government revenue.

701 Assuming that  $\theta = g = 0$ , we write these conditions in compensated form:

$$\frac{\partial \mathcal{L}^C}{\partial \theta} \Big|_{\theta=g=0} = -(1-\pi) E \{u'(d)b - H'(m)Eb\} = -(1-\pi) \{cov(u'(d), b) - E(H'(m) - u'(d))Eb\}$$

(4.15)

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704 Given that  $H'(m) - u'(d) > 0$ , one has that  $\frac{\partial \mathcal{L}^C}{\partial \theta} \Big|_{\theta=g=0} > 0$ . In other words,  
705 taxing bequests to finance public LTC is desirable.

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Note that, if we reformulate the problem by introducing different disability risk  $\pi_i$ , we would rewrite (4.15) as:

$$\frac{\partial \mathcal{L}^C}{\partial \theta} \Big|_{\theta=g=0} = -cov(u'(d), (1-\pi)b) + \frac{E((1-\pi)b)}{E\pi} [cov(H'(m), \pi) + E\pi E(H'(m) - u'(d))]$$

(4.16)

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710 Given the observed negative correlation between  $w$  and  $\pi$ ,  $cov(H'(m), \pi) >$   
711  $0$ , which reinforce the desirability of this way of financing public LTC.

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Cremer et al. (2016) delve into a dynamic where both parents and children display altruistic behaviors, with children's altruism being potentially partial. When parents face the risk of dependency, they anticipate support from their children, who are influenced by both altruism and the prospect of an inheritance. Their paper argues that laissez-faire outcomes are inefficient if children are not completely altruistic and suggests that efficiency can be restored through policies such as linear subsidies for informal care, linear bequest taxes, and specific lump-sum transfers. In a more constrained policy environment without state-specific transfers, the study proposes that linear taxes on bequests and children's labor income can still provide partial insurance, echoing some of Brunner's (2012) findings.

Canta and Cremer (2019) examine a model inspired by the strategic bequest approach, where parents condition their bequests on the amount of informal care they receive. All parents are assumed to be identical, while children differ in their care provision costs, a proxy for factors like altruism or opportunity costs. Due to asymmetric information where parents cannot see these costs, they cannot fully harness the potential exchange benefits, leading to suboptimal care levels from higher-cost children under laissez-faire conditions. The paper considers two types of social LTC policies: a uniform policy that offers equal LTC transfers funded by a uniform

739 tax, and more tailored policies that link LTC benefits to observable transfers between  
 740 parents and children. While the first type does not completely shield parents from the  
 741 risk of having a high-cost caregiver child, the second type provides comprehensive  
 742 insurance against such risks. The study underscores that even with potential private  
 743 insurance solutions, public intervention might still be justified due to different objec-  
 744 tives between parents and the government, compounded by high costs and challenges  
 745 associated with private insurance offerings. The above models rest on a government  
 746 that maximizes a utilitarian social welfare function.

747 Leroux and Pestieau (2022) explore the optimal structure of taxes on bequests  
 748 under both utilitarian and Rawlsian frameworks. Given the government's inability  
 749 to ascertain whether bequests are intentional or accidental—but with access to data  
 750 on timing and health status at death—they analyze how early bequests, late bequests  
 751 when healthy and late bequests when disabled should be taxed. In the utilitarian  
 752 approach, bequest taxes are influenced by equity, insurance, and public revenue con-  
 753 siderations. Should equity concerns prevail, higher taxes are justified for those who  
 754 live longer and in better health, whereas lower taxes apply to those who die sooner.  
 755 Conversely, if insurance factors dominate, higher taxes would target early bequests,  
 756 with reduced taxes on bequests under dependency conditions. Under Rawlsian prin-  
 757 ciples, the optimal policy advocates minimal taxes on early bequests, while imposing  
 758 higher taxes on bequests left by healthy, long-lived individuals.

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## 759 4.4 The Rule of Reimbursement

760 We now move to the design of an insurance contract and the issue of whether we  
 761 should opt for a contract based on coinsurance or on deductible. We keep in mind  
 762 Arrow's underrated deductible theorem. This theorem states that, if an insurance  
 763 company is willing to offer any insurance policy against loss desired by the buyer  
 764 at a premium which depends only on the policy's actuarial value, then the policy  
 765 chosen by a risk-averse buyer will take the form of 100% coverage above a deductible  
 766 minimum.<sup>9</sup> This theorem rests on the existence of loading costs. Otherwise, there  
 767 would be a 100% insurance coverage. It implies that an insurance with deductible  
 768 dominates the more traditional policy based on coinsurance rates.

769 Following Dréze and Schokkaert (2013), Dréze et al. (2016) consider a simple  
 770 example with  $S$  states of nature.  $A_s$  is the initial health status that decreases with  
 771  $s$  ( $s = 1, 2, \dots, S$ ). The final health status is denoted by  $m_s = A_s + d_s$  where  $d_s$   
 772 represents the level of medical expenditures and at the same time the improvement  
 773 in health. The individual has a given income  $w$  and a utility  $U_s$  that depends on  
 774 consumption  $c_s$  and health  $m_s$ . The insurance rate is  $\alpha_s$ , the insurance premium  $I$   
 775 and the loading factor  $\lambda$ . The rate of coinsurance is thus  $1 - \alpha_s$ . A direct application  
 776 of this model is sickness or dependance. As  $s$  increases the severity of sickness grows  
 777 or the number of months of dependence augments.

<sup>9</sup> Arrow (1963).

778 We first analyze the case where health spending is observable and then the case  
 779 where it is not observable and can thus be influenced by the rate of reimbursement,  
 780 which is the case with ex post moral hazard.<sup>10</sup>

#### 781 4.4.1 No Moral Hazard

782 Individual utility is given by:

$$783 \quad U_s = u(c_s) + h(m_s)$$

784 or

$$785 \quad U_s = u(w - I - (1 - \alpha_s) d_s) + h(A_s + d_s)$$

786 The insurance premium is defined as:

$$787 \quad I = (1 + \lambda) \sum_t^S \pi_t \alpha_t d_t.$$

788 We can now write the problem to be solved, namely, finding the values of  $d_s$  and  
 789  $\alpha_s$  that maximize the following expected utility (denoted by  $\mathcal{L}$ ):

$$790 \quad \mathcal{L} = \sum_s \pi_s \left[ u(w - (1 + \lambda) \sum_t^S \pi_t \alpha_t d_t - (1 - \alpha_s) d_s) + h(A_s + d_s) \right]$$

791 We obtain the FOCs:

$$792 \quad \frac{\partial \mathcal{L}}{\partial d_s} = -u'(c_s) (1 - \alpha_s) + h'(m_s) - (1 + \lambda) \alpha_s \sum \pi_t u'(c_t) = 0$$

$$793 \quad \frac{\partial \mathcal{L}}{\partial \alpha_s} = d_s \left[ u'(c_s) - (1 + \lambda) \sum \pi_t u'(c_t) \right] \leq 0$$

794 This implies:

$$795 \quad u'(c_s) = h'(m_s)$$

796 and we distinguish between two regimes of light and heavy disability according to  
 797 the value of  $s$  with respect to a threshold value  $\bar{s}$ .

---

<sup>10</sup> In insurance economics, we distinguish between ex ante and ex post moral hazard. Ex ante moral hazard is a change in behavior prior to the outcome of the random event. Ex post moral hazard involves behavior after the outcome.

798 
$$s < \bar{s} \Rightarrow \frac{\partial \mathcal{L}}{\partial \alpha_s} < 0 \Rightarrow \alpha_s = 0$$

799 and

800 
$$s > \bar{s} \Rightarrow \frac{\partial \mathcal{L}}{\partial \alpha_s} = 0 \Rightarrow u'(c_s) = (1 + \lambda) \sum \pi_t u'(c_t) \Rightarrow (1 - \alpha_s) d_s = F$$

801 In other words, for any expense below  $F$  there is no coverage. For any expense  
 802 above  $F$  there is full coverage.  $F$  is the deductible.

803 Note that if  $\lambda = 0$ ,  $\alpha_s = 1$  and there is full coverage of any expense.

804 **4.4.2 Moral Hazard**

805 We know that introduces the possibility of ex post moral hazard. Now spending is  
 806 not observable and chosen by the individual given the value of  $\alpha$ . This amounts to:

807 
$$Max_{d_s} = u(w - I - (1 - \alpha_s) d_s) + h(A_s + d_s).$$

808 The FOC is:

809 
$$- u'(c_s)(1 - \alpha_s) + h'(m_s) = 0.$$

810 We thus have  $d(\alpha_s)$  with  $\frac{\partial d_s}{\partial \alpha_s} > 0$ . The problem of the insurer is thus to find the  
 811 values of  $\alpha_s$  that maximize:

812 
$$\mathcal{L} = \sum p_s \left[ u(w - (1 + \lambda) \sum \pi_t \alpha_t d_t - (1 - \alpha_s) d_s) + h(A_s + d_s) \right]$$

813 The solution is not necessarily interior, and the FOC is written as:

814 
$$\frac{\partial \mathcal{L}}{\partial \alpha_s} = \left[ -u'(c_s)(1 - \alpha_s) + h'(m_s) - (1 + \lambda)\alpha_s \sum \pi_t u'(c_t) \right] \frac{\partial d_s}{\partial \alpha_s} +$$
  
 815 
$$816 d_s \left[ u'(c_s) - (1 + \lambda) \sum \pi_t u'(c_t) \right] \leq 0.$$

817 OR

818 
$$\frac{\partial \mathcal{L}}{\partial \alpha_s} = d_s u'(c_s) - \left[ (1 - \alpha_s) u'(c_s) \frac{\partial d_s}{\partial \alpha_s} - h'(m_s) \frac{\partial d_s}{\partial \alpha_s} \right] -$$
  
 819 
$$\left[ d_s + \frac{\partial d_s}{\partial \alpha_s} \alpha_s \right] (1 + \lambda)(1 + \eta_s) \sum \pi_t u'(c_t) \leq 0$$

Author Proof

820 After simplifications, we obtain:

$$821 \quad \frac{\partial \mathcal{L}}{\partial \alpha_s} = d_s \left[ u'(c_s) - (1 + \lambda)(1 + \eta_s) \sum \pi_t u'(c_t) \right] \leq 0$$

822 where  $\eta_s = \frac{\alpha_s \partial d_s}{d_s \partial \alpha_s} > 0$  is the elasticity of spending in state  $s$  with respect to the  
 823 insurance rate. If  $\eta_s = \bar{\eta}$  is constant,  $c_s$  is constant and the deductible is  $(1 - \alpha_s) d_s =$   
 824  $F$  with  $\frac{dF}{d\bar{\eta}} > 0$ . Whether this elasticity is constant is an empirical question.

### 825 4.4.3 Social Insurance with Deductible

826 Starting from the above model, Klimaviciute and Pestieau (2018a) analyze optimal  
 827 social LTC insurance under conditions of varying productivity and LTC needs, focus-  
 828 ing on contracts with deductibles. They find that optimal public policy should mirror  
 829 private insurance practices using deductibles if the government and private insurers  
 830 have similar operational costs. The necessity for public intervention grows if the gov-  
 831 ernment can operate more efficiently than private insurers or if there are significant  
 832 variations in LTC needs across individuals. In Klimaviciute and Pestieau (2018b), the  
 833 study extends to a more diverse society with differing income levels and dependency  
 834 risks, assuming a strong inverse relationship between these factors. They explore  
 835 more constrained public policies, suggesting that negative or zero deductibles could  
 836 be optimal due to redistributive needs, despite potential increases in cost.<sup>11</sup> Even with  
 837 private insurance options, their findings imply that not all individuals would choose  
 838 to insure privately at the social optimum, pointing toward a blended approach of  
 839 public and private insurance solutions under specific conditions.

## 840 4.5 Spending Down

841 We now present a simple model aimed at discussing two methods for discouraging  
 842 middle-class individuals from utilizing a social assistance program for long-term  
 843 care (LTC) that is intended for low-income individuals.<sup>12</sup> The first method involves  
 844 raising the wealth threshold that individuals can possess at the onset of their disability.  
 845 The second method is to implement a look-back period to assess whether individuals  
 846 exceeded this threshold in the past. In this simple model, we focus on the old age  
 847 that is divided in three periods. At the start, individuals are just characterized by their  
 848 initial wealth  $w$ . They further earn an income  $z$  during the first two periods.

849 During the first two periods, individuals are healthy. In each period, individuals'  
 850 utility depends on their consumption  $c_t$  with  $t = 1, 2, 3$  and the transfers  $b_t$  they

<sup>11</sup> See also Klimaviciute and Pestieau (2020).

<sup>12</sup> Lozachmeur et al. (2025).

851 make to their children. At the start of the third period, they run the risk of becoming  
 852 dependent with probability  $\pi$ . In case of disability, they can use part of their savings  
 853 to finance their long-term care  $m$  or use means tested services denoted  $g$ . In case of  
 854 disability, they make a transfer  $b_d$  to their children, whereas in case of good health  
 855 they leave a bequest of  $b_3$ . In this model, we make two simplifying assumptions.  
 856 First, topping up is not allowed meaning that  $g$  cannot be combined with private  
 857 services. Second, we are not concerned by the way  $g$  is financed. LTC services are  
 858 only available to disabled elderly if their wealth at the start of the third period is less  
 859 than a certain amount  $x$ . There is thus a wealth level  $w$  for which individuals are  
 860 indifferent between resorting to the public scheme and self-financing their long-term  
 861 care. To limit access to the public LTC program, the government may decide that  
 862 this wealth limit should be imposed at the start of the second period. As we shall  
 863 see, the introduction of this look-back period has the effect of increasing first-period  
 864 inter-vivos gifts ( $b_1$ ) but reducing second-period ones ( $b_2$ ).

865 We consider three cases that will lead to partitioning our society along the variable  
 866  $w$ . We present the lifetime utility under these different regimes. It will be denoted  
 867  $U^j$ , where  $j = A, B, C$ .

- 868 • A. Not using Medicaid

$$869 \quad U^A = u(c_1) + v(b_1) + \beta [u(c_2) + v(b_2)] + \beta^2$$

$$870 \quad [\pi (H(m) + v(b_d)) + (1 - \pi) (u(c_3) + v(b_3))]$$

872 or more explicitly

$$873 \quad U^A = u(w + z - b_1 - s_1) + v(b_1) + \beta [u(s_1 R + z - b_2 - s_2) + v(b_2)]$$

$$874 \quad + \beta^2 [\pi (H(s_2 R - b_d) + v(b_d)) + (1 - \pi) (u(s_2 - b_3) + v(b_3))]$$

- 876 • B. No look back period. Resources ceiling:  $x$

$$877 \quad U^B = u(c_1) + v(b_1) + \beta [u(c_2) + v(b_2)]$$

$$878 \quad + \beta^2 [\pi (H(g) + v(b_d)) + (1 - \pi) (u(c_3) + v(b_3))]$$

880 OR

$$881 \quad U^B = u(w + z - b_1 - s_1) + v(b_1) + \beta [u(s_1 R + z - b_2 - x) + v(b_2)]$$

$$882 \quad + \beta^2 [\pi (H(g) + v(xR)) + (1 - \pi) (u(xR - b_3) + v(b_3))]$$

883 We assume that  $x < s_2$ , which means that the individual would have liked to save  
884 more than  $x$ , but chooses not to do so to enjoy  $g$ .

885 • C. One look back period. Resources ceiling:  $x$

$$886 \quad U^C = u(c_1) + v(b_1) + \beta [u(c_2) + v(b_2)]$$

$$887 \quad + \beta^2 [\pi (H(g) + v(b_d)) + (1 - \pi) (u(c_3) + v(b_3))]$$

889 OR

$$890 \quad U^C = u(w + z - b_1 - x) + v(b_1) + \beta [u(xR + z - b_2 - s_2) + v(b_2)]$$

$$891 \quad + \beta^2 [\pi (H(g) + v(s_2R)) + (1 - \pi) (u(s_2R - b_3) + v(b_3))]$$

893 We here assume that  $x < s_1$ .

894 In this expression,  $u(\cdot)$ ,  $v(\cdot)$ ,  $H(\cdot)$  are strictly concave utility functions,  $R$  is the  
895 interest factor;  $\beta$ , the time preference factor;  $z$ , the income earned in the first two  
896 periods. The population can be partitioned into two groups: those who benefit from  
897 Medicaid and those who self-insure. When the public LTC program does not include  
898 a look-back period provision (case B), we have the individuals who finance their  
899 own LTC spending and those who resort to public LTC. The threshold wealth that  
900 separates those two groups is denoted  $w_{AB}$ , that is the level of wealth for which  
901  $U^A = U^B$ .

902 Similarly we have  $w_{AC}$ , which is the level for which individuals are indifferent  
903 between case A and case C.

904 By differentiating  $U^A - U^B = 0$  with respect to  $x$  and  $w$ , we have that:

$$905 \quad \frac{dw_{AB}}{dx} = - \frac{u'(d^B) - v'(x)}{u'(c_1^A) - u'(c_1^B)} > 0$$

906 where  $u'(d^B) - v'(x) < 0$  comes from the fact that the constraint  $x$  is binding. This  
907 implies that as the allowed wealth ceiling decreases, the number of benefitters from  
908 Medicaid decreases.

909 We are interested in the impact of the introduction of a look-back period. It can  
910 easily be shown that for the same  $w$  and  $x$ ,  $U^B > U^C$ , which implies that introducing  
911 a look-back period deters some individuals from applying to the public LTC program.  
912 This is quite intuitive. In case C, the individual is left with an amount of resources  
913  $x$  to finance his consumption and transfers in the second and third period whereas,  
914 in case B, he can use the same amount to finance both consumption and bequests in  
915 just the third period.

916 In our model, spending down occurs through intergenerational transfers. In the  
917 case B, the individual devotes all the allowed saving  $x$  to bequests in case of depen-  
918 dence. Decreasing  $x$  means decreasing bequests. If we move to case C with look-back,  
919 first and second period saving decreases further:  $s_1^C = x < s_1^B$ . and  $s_2^C < s_1^B = x$ .

Hence, we have that  $b_1^C > b_1^B$ ,  $b_3^C < b_3^B$  and  $b_2^C < b_2^B$ . This leads us to the following conclusions. First, when the threshold  $x$  decreases, the number of users of public LTC decreases, the level of early transfers increases and the level of bequests decreases. Second, when a look-back period is introduced while keeping the threshold  $x$  constant, the number of users of public LTC decreases. First period inter-vivos gifts increase but later gifts and bequests decrease.

## 4.6 Capital Accumulation with LTC

Until now, we have employed a static framework. In this section, we extend the analysis to a dynamic setting to explore the impact of old-age disability and long-term care policies on capital accumulation and welfare. For this purpose, we utilize the canonical two-period overlapping generations model established by Diamond (1965) and Samuelson (1958). The model assumes a closed economy with perfect competitive markets.

### 4.6.1 Basic Model

Time is discrete, and in each period  $t$ , the economy features three goods: capital, labor, and a physical good produced using capital and labor.

Each individual belongs to a generation  $t$  and lives for up to two periods, resulting in two overlapping generations at any point in time. The first period of life has a unitary length; the individual works with an inelastic supply of labor and earns a wage  $w_t$ . This wage is devoted to present consumption  $c_t$  and saving  $s_t$ . The second period is uncertain and depends on a survival probability  $\phi$ . If the individual survives, he/she will not work and consume  $d_t$  that is financed by the return of saving  $s_t R_{t+1}/\phi$ , where  $R_{t+1}/\phi$  is the return of an actuarially fair annuity.  $R_{t+1} = 1 + r_{t+1}$  is the interest factor and  $r_{t+1}$  is the interest rate. The lifetime utility of an individual belonging to generation  $t$  can be written as:

$$U_t = u(c_t) + \beta\phi u(d_t)$$

OR

$$U_t = u(w_t - s_t) + \beta\phi u(s_t R_{t+1}/\phi)$$

where  $u(\cdot)$  is strictly concave and  $\beta$  is the time preference factor. Note that we use the generation index for consumption and labor supply and the time index for the factor prices.

The optimization problem of an individual is to allocate labor income over the lifetime in order to maximize her utility. The first-order condition with respect to  $s_t$  is:

$$-u'(c_t) + \beta\phi R_{t+1}u'(d_t) = 0,$$

which means that the marginal utility of first-period consumption is equal to the marginal utility of second-period consumption multiplied by a factor equal to  $\beta\phi R$ . Turning to the production side, we assume a representative firm producing at period  $t$  with a simple constant return to scale technology such that aggregate output depends on the capital stock and the labor force:

$$Y = F(K_t, L_t)$$

where  $L_t$  denotes the labor force that is here equal to  $N_t$ , the size of generation  $t$ . Population grows at the rate  $n$  such that:

$$N_t = N_{t-1}(1 + n).$$

As one period represents a working life, it is reasonable to assume that the stock of capital fully depreciates at the end of a period. The stock of capital at time  $t + 1$  is thus equal to saving at time  $t$ .

$$K_{t+1} = N_t s_t$$

The objective of the representative firm is to maximize profit and the condition for a maximum profit is:

$$R_t = F_K(K_t, L_t); w_t = F_L(K_t, L_t)$$

or, in intensive terms, with  $k = K/N$  and  $y = Y/N = f(k)$ ,

$$R_t = f'(k_t); w_t = f(k_t) - f'(k_t)k_t.$$

As it is standard in the literature, we use the logarithmic function for utility and the Cobb-Douglas function for the production, namely

$$U_t = \log(w_t - s_t) + \beta\phi \log(s_t R_{t+1}/\phi)$$

and

$$Y = AK^\alpha L^{1-\alpha},$$

where  $A$  is the total factor productivity (which is constant) and  $0 < \alpha < 1$ . With these functional forms, we have that:

$$(1 + n)k_{t+1} = s_t = \frac{\phi\beta}{1 + \phi\beta} w_t = \frac{\phi\beta}{1 + \phi\beta} (1 - \alpha) Ak_t^\alpha.$$

981 The inter-temporal equilibrium is characterized by the dynamics of the stock of  
 982 capital  $k_t$  and the model converges to a steady state that is given by:

$$983 \quad k^{SS} = \left[ \frac{\phi\beta A}{1 + \phi\beta} \frac{1 - \alpha}{1 + n} \right]^{\frac{1}{1-\alpha}}$$

984 with  $\frac{\partial k^{SS}}{\partial \pi} > 0$ ;  $\frac{\partial k^{SS}}{\partial n} < 0$ . Hence, population aging because of an increase in  $\phi$  (but  
 985 also because of a fall in  $n$ ) increases the per capita capital stock.

986 It is interesting to contrast the market solution obtained from the maximization of  
 987 the utility of a single generation with the solution that would maximize total welfare  
 988 in the steady state. This social optimum is obtained by maximizing the generational  
 989 utility  $U = u(c) + \phi\beta u(d)$  subject to the resource constraint:

$$990 \quad f(k) = k(1 + n) + c + \frac{\phi d}{1 + n}.$$

991 We thus have to find the values of  $k$  and  $d$  that maximize the lifetime utility:

$$992 \quad U = u \left[ f(k) - k(1 + n) - \frac{\phi d}{1 + n} \right] + \phi\beta u(d).$$

993 The first-order conditions are:

$$994 \quad f'(k_t) = (1 + n) \tag{4.17}$$

$$995 \quad u'(c) = (1 + n) \beta u'(d)$$

996 where (4.17) is the Golden rule level of capital accumulation. It is defined by the  
 997 equality of the growth rate of the population  $n$  with the marginal productivity of  
 998 capital. With the Cobb-Douglas production function, the optimal capital accumu-  
 999 lation is  $k^* = \left( \frac{\alpha A}{1+n} \right)^{\frac{1}{1-\alpha}}$ . It is generally admitted that  $1 + r = f'(k) > 1 + n$ . This  
 1000 condition means that the economy is dynamically efficient, namely in a state of  
 1001 under-accumulation. Note that unlike  $k^{SS}$ ,  $k^*$  depends on  $n$  but not on either  $\phi$  or  $\beta$ .

## 1002 4.6.2 Disability in Old Age

1003 We introduce the probability  $\pi$  of getting old and dependent along with the probability  
 1004  $\phi$  of surviving beyond the first period. We assume a fair annuity market as well as a  
 1005 fair LTC insurance market. We write the lifetime utility of an individual belonging  
 1006 to generation  $t$  as:

$$1007 \quad U_t = u(w_t - s_t - I_t) + \beta \left[ \phi(1 - \tau)u(s_t R_{t+1}/\phi) + \pi H(s_t R_{t+1}/\phi + I_t R_{t+1}/\phi\pi) \right]$$

1008 where  $I_t$  is the LTC insurance premium. With first look at the market solution when  
1009 there is a LTC insurance and then we assume away such insurance, but introduce  
1010 some LTC public policy.

1011 **Market solution with LTC insurance** Maximizing  $U_t$  with respect to  $s_t$  and  $I_t$   
1012 yields the FOCs:

$$1013 \quad u'(c_t) = \beta R_{t+1} \left[ (1 - \pi)u'(d_t) + \pi H'(m_t) \right] \quad (4.18)$$

$$1014 \quad u'(c_t) = \beta R_{t+1} H'(m_t) \quad (4.19)$$

1015 Combining (4.18) and (4.19) yields:

$$1016 \quad u'(c_t) = \beta R_{t+1} u'(d_t)$$

1017 Turning to the log specification, we have

$$1018 \quad U_t = \log(w_t - s_t - I_t) + \beta \phi \left[ (1 - \pi) \log(s_t R_{t+1}/\phi) \right. \\ 1019 \quad \left. + \pi (\kappa \log(s_t R_{t+1}/\phi + I_t R_{t+1}/\pi\phi) - a) \right]$$

1021 where the parameters  $a > 0$  and  $\kappa > 1$  give the desired property that  $H'(z) > u'(z)$   
1022 and  $H(z) < u(z)$ . With this specification, the FOCs become:

$$1023 \quad \frac{1}{w_t - s_t - I_t} = \frac{\beta\kappa}{s_t/\phi + I_t/\pi\phi} = \frac{\beta\phi(1 - \pi)}{s_t} + \frac{\pi\kappa\beta}{s_t/\phi + I_t/\pi\phi} \quad (4.20)$$

1024 From (4.20), we get:

$$1025 \quad I_t = s_t \pi (\kappa - 1) \quad (4.21)$$

1026 Combining (4.20) and (4.21), we obtain the expression for capital accumulation:

$$1027 \quad (1 + n)k_{t+1} = s_t + I_t = \frac{\phi\beta(1 + \pi(\kappa - 1))}{1 + \phi\beta(1 + \pi(\kappa - 1))} (1 - \alpha)k_t^\alpha.$$

1028 This can be rewritten as:

$$1029 \quad (1 + n)k_{t+1} = S(1 - \alpha)k_t^\alpha$$

1030 where  $S = \frac{\phi\beta(1 + \pi(\kappa - 1))}{1 + \phi\beta(1 + \pi(\kappa - 1))}$  can be considered as the saving rate that is time invariant  
1031 in this particular case. In the steady state, we get:

$$1032 \quad k^{SS} = \left[ S \frac{1 - \alpha}{1 + n} \right]^{\frac{1}{1 - \alpha}}$$

1033 One observes that  $S$  as well as  $k^{SS}$  increase with both  $\phi$  and  $\pi$ . In other words,  
 1034 both the survival probability and the disability risk foster capital accumulation. The  
 1035 first increases the need for retirement savings, and the second, the needs for LTC  
 1036 spending.

1037 **Market solution without LTC insurance but with a subsidy on LTC.** We now  
 1038 assume that there is no LTC insurance, but that the government introduce a subsidy  
 1039 on LTC spending that is financed by a payroll tax  $\tau$ . Keeping the log example, we  
 1040 now write the lifetime utility of a member of generation  $t$  as:

$$1041 \quad U_t = \log(w_t (1 - \tau_t) - s_t) + \beta\phi$$

$$1042 \quad \left[ (1 - \pi) \log\left(s_t \frac{R_{t+1}}{\phi}\right) + \pi \left( \kappa \log\left(\left(s_t \frac{R_{t+1}}{\phi} (1 + \sigma)\right)\right) - a \right) \right]$$

1044 where  $\sigma$  is the subsidy rate that is time invariant. Underlying this tax-subsidy scheme,  
 1045 we have the revenue constraint that:

$$1046 \quad \tau_t w_t = \sigma \pi s_{t-1} R_t / \phi$$

1047 With this specification, the FOCs become:

$$1048 \quad \frac{1}{w_t (1 - \tau_t) - s_t} = \frac{\beta\phi(1 - \pi)}{s_t} + \frac{\pi\kappa\beta}{s_t} \quad (4.22)$$

1049 and hence:

$$1050 \quad s_t = S w_t (1 - \tau_t) \quad (4.23)$$

1051 From (4.23), we obtain the expression for capital accumulation:  $(1 + n)k_{t+1} =$   
 1052  $(1 - \tau_t) (1 - \alpha) S k_t^\alpha$ . In the steady state, we get:

$$1053 \quad k^{SS} = \left[ S \frac{(1 - \tau) (1 - \alpha)}{1 + n} \right]^{\frac{1}{1-\alpha}}$$

1054 One easily check that  $k^{SS}$  increases with  $\phi$  and  $\pi$  as above, but decreases with  $\tau$ .

### 1055 4.6.3 Social Optimum

1056 We can now contrast these solutions with that obtained by looking at the social opti-  
 1057 mum. To do so, we have to find the values of  $c$ ,  $d$ ,  $k$ ,  $m$  that maximize the lifetime  
 1058 utility in the steady-state

1059

$$\begin{aligned} \mathcal{L} = & u(c) + \beta\phi [(1 - \pi)u(d) + \pi H(m)] \\ & - \mu \left[ c + \frac{\phi((1 - \pi)d}{1 + n} + \frac{\pi\phi m}{1 + n} + (1 + n)k - f(k) \right] \end{aligned}$$

We obtain the following FOCs:

$$f'(k) = 1 + n; u'(c) = \beta R u'(d) = \beta R H'(m) = \mu.$$

The equality  $f'(k) = 1 + n$  corresponds to the Golden rule and implies  $k^* = \left[ \frac{\alpha}{1+n} \right]^{\frac{1}{1-\alpha}}$  that is independent of either  $\pi$  and  $\phi$ . The decentralization of this first-best optimum requires an intergenerational transfer scheme to achieve the golden rule and the presence of actuarially fair annuities and long-term care insurance.

To sum up, we have shown that if fair LTC insurance and annuity markets exist, we have in the steady state a level of capital and output that increases with the survival probability and the disability risk. In case there is no LTC insurance and the government subsidizes private LTC spending with a payroll tax, the tax implies a lower level of capital and output.

It is clear that lump sum transfers are generally not available, and one has to resort to distortionary instruments such as public pensions, long-term care public benefits, and income taxation. The problem is that there is a conflict between those instruments that tend to discourage saving and the achievement of dynamic efficiency. In a model with family assistance, *Canta et al. (2016)* reach an interesting result: public LTC insurance operates as a complement to private insurance and hence fosters capital accumulation. *Ponthiere and Thibault (2025)* also employ an overlapping generations model where survival probability depends on preventive health spending. They demonstrate that when considering the possibility of autonomy loss in old age, the joint improvement of economic and longevity outcomes—commonly referred to as the Preston Curve—is not observed.

## 4.7 Political Economy

While models focusing on the political economy of LTC are less prevalent than those dedicated to optimal policy design, they offer valuable insights into a variety of settings, from behavioral biases to family dynamics and the political feasibility of programs targeting the economically disadvantaged. These models generally find some level of political support for social LTC schemes, but this support can be undermined by factors such as familial obligations, behavioral misconceptions, competition with private insurance, or the inadequacy of proposed social programs. Ensuring broad-based political support, especially from the middle class, for social LTC programs aimed at the poor remains a complex and challenging endeavor. This complexity underscores the multifaceted nature of political sustainability in social LTC programs, akin to the intricacies of optimal policy design.

1097 As an illustration of the problem at hand, we now present a simple model of vote  
 1098 over a social LTC scheme. In this model, LTC public benefit  $g$  is uniform and financed  
 1099 by a payroll tax  $\tau$ . Family assistance is assumed away. Individuals differ only in their  
 1100 wage levels and disability risk. They can purchase actuarially fair LTC insurance.  
 1101 The lifetime utility of an individual with wage  $w_i$  can be written as follows:

$$1102 \quad U_i = u((1 - \tau) w_i l_i - s_i - I_i - v(l_i)) + (1 - \pi_i)u(s_i) + \pi_i H(s_i + g + I_i/\phi_i)$$

$$1103 \quad \text{where } g = \tau \frac{\sum n_j w_j l_j}{\bar{\pi}} \text{ and } \bar{\pi} = \sum n_j \pi_j$$

1104 Maximizing  $U_i$  with respect to  $l_i$ ,  $s_i$ , and  $I_i$  leads to the FOCs:

$$1105 \quad \frac{\partial U_i}{\partial l_i} = u'(c_i) [-w_i l_i (1 - \tau) + v(l_i)] = 0$$

$$1106 \quad \frac{\partial U_i}{\partial s_i} = -u'(c_i) + \pi_i H'(m_i) + (1 - \pi_i) u'(s_i) s_i = 0$$

$$1107 \quad \frac{\partial U_i}{\partial I_i} = -u'(c_i) + H'(m_i) \geq 0$$

1109 Then we look at the tax rate that each individual of type  $i$  would choose. This is  
 1110 given by the FOC:

$$1111 \quad \frac{\partial U_i}{\partial \tau} = -u'(c_i) w_i l_i + \pi_i H'(m_i) \left[ \frac{\bar{w}l}{\bar{\pi}} + \tau \frac{\sum n_j w_j \frac{\partial l_j}{\partial \tau}}{\bar{\pi}} \right] \geq 0$$

1112 When the solution is interior, we can define the optimal value of the tax from the  
 1113 viewpoint of individuals of type  $i$ :

$$1114 \quad \tau^i = \frac{1 - \frac{w_i l_i}{\pi_i} \frac{\bar{\pi}}{\bar{w}l}}{-\frac{\sum n_j w_j \frac{\partial l_j}{\partial \tau}}{\bar{w}l}}$$

1115 Differentiating  $U_i$  with respect to  $\tau$ , it is straightforward to see that preferences  
 1116 over  $\tau$  are concave (and thus single-peaked), so that we can apply the median voter  
 1117 theorem and obtain that there may exist a value of  $\tau^*$  that is preferred by a majority  
 1118 of voters to any other value of  $\tau$ . This majority-chosen level  $\tau^*$  corresponds to the  
 1119 value of  $\tau$  that is such that at least half the polity exhibits  $\tau > \tau^*$  while at least half  
 1120 is such that  $\tau < \tau^*$ . In the case where  $l_i = 1$ , we observe that the set of agents who  
 1121 favor  $\tau > 0$  is made of all agents with  $\frac{w_i}{\pi_i} < \frac{\bar{w}}{\bar{\pi}}$ .

1122 Using such a model with family assistance, De Donder and Pestieau (2017) ana-  
 1123 lyze how individual differences in income, risk of dependence, and family support  
 1124 affect preferences for social versus private insurance. Their results suggest that fam-  
 1125 ily support tends to decrease the demand for both types of insurance, especially

1126 private. Despite this, they find that most individuals would oppose a ban on private  
 1127 insurance, even though its presence reduces the chosen level of social insurance in  
 1128 voting scenarios.

1129 Nuscheler and Roeder (2013) examine the impact of family dynamics on the  
 1130 support for public LTC. They model a society composed of single-parent families  
 1131 with varying child productivity. Their findings highlight a political conflict between  
 1132 families with and without disabled parents and between wealthy and less affluent  
 1133 families, illustrating how income inequality negatively correlates with public LTC  
 1134 spending. This relationship may shift with demographic changes influencing the  
 1135 demand for LTC and the corresponding supply of informal care.

1136 De Donder and Leroux (2013) explore the dynamics of political support for social  
 1137 LTC insurance, accounting for behavioral biases in individual decision-making. Their  
 1138 model posits that all individuals face identical risks of dependency but have different  
 1139 perceptions and responses to these risks. They classify individuals into three groups  
 1140 based on their behavioral biases: sophisticated procrastinators, who underestimate  
 1141 their risk but correct this bias when voting; optimistic individuals, who underesti-  
 1142 mate only their personal risk while acknowledging the average risk; and myopic  
 1143 individuals, who underestimate both personal and average risks. The study finds  
 1144 that sophisticated procrastinators achieve optimal outcomes, whereas optimistic and  
 1145 myopic individuals tend to underinsure and over-save. Interestingly, in scenarios  
 1146 where private insurance is available, the more biased individuals fare worse off than  
 1147 in scenarios without private insurance options, except for the less biased optimists.

1148 De Donder and Leroux (2017) explore a model where families consist of one  
 1149 elderly parent and one adult child. They find several reasons for the limited social  
 1150 LTC transfers, such as parents' preference for time over monetary help from their  
 1151 children and the potential opposition from disability free families to social LTC  
 1152 schemes.

1153 Cremer et al. (2021) investigate the political viability of means-tested social pro-  
 1154 grams, like Medicaid in the USA, in environments without familial aid. They propose  
 1155 a model where a Rawlsian government initially decides the likelihood of middle-class  
 1156 inclusion in these programs, followed by a majority vote on the level of benefits. Their  
 1157 findings indicate that the ideal probability of middle-class inclusion decreases with  
 1158 greater income inequality but increases with higher relative risk aversion among  
 1159 middle-class individuals.

## 1160 **Last Remark**

1161 This chapter, the most significant in this book, has explored the design of long-term  
 1162 care policies by presenting various models that address specific challenges. Given  
 1163 the complexity of the issues at stake, constructing a single, all-encompassing model  
 1164 is neither feasible nor realistic. However, a common thread runs through all the  
 1165 topics discussed: the imperative to consider both the family and the market when  
 1166 formulating optimal policies.

1167 It is also worth noting that the literature on long-term care policy has grown sub-  
 1168 stantially, making it impossible to provide an exhaustive overview. This chapter,  
 1169 therefore, offers a selective—and inevitably subjective—perspective on the key  
 1170 debates shaping the field.

### 1171 Notation Used in This Chapter

- 1172 •  $U(\cdot)$  : lifetime utility
- 1173 •  $u(\cdot)$  : strictly concave utility function of consumption  $c$  or  $d$
- 1174 •  $H(m)$  : strictly concave utility function of LTC  $m$
- 1175 •  $H(a, m)$  : quasi concave utility of  $a$ , informal care, and  $m$ , formal care
- 1176 •  $h(l)$  : strictly concave disutility of labor  $l$
- 1177 •  $x = c - h(l)$  : net consumption
- 1178 •  $\pi$  : probability of disability
- 1179 •  $\phi$  : survival probability
- 1180 •  $\zeta$  : probability of informal care
- 1181 •  $g$  : public LTC benefits
- 1182 •  $w, \omega$  : wage rates
- 1183 •  $n_i$  : the relative number of type  $i$ 's individuals
- 1184 •  $P$  : public pension benefits
- 1185 •  $\mathcal{L}$  : Lagrangian expression
- 1186 •  $\mu$  : Lagrange multiplier associated with the revenue constraint
- 1187 •  $I$  : private insurance premium
- 1188 •  $s$  : saving
- 1189 •  $b$  : bequests
- 1190 •  $\theta, \tau$  : tax rates
- 1191 •  $\lambda$  : loading factor
- 1192 •  $\alpha_s$  : insurance rate

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Abstract	<p>This final chapter departs significantly from its predecessors, examining two critical issues that define life's final stages and pose fundamentally ethical rather than economic questions. The first explores the vulnerability of frail elderly individuals to mistreatment during their most defenseless period. The second investigates how policymakers might best structure end-of-life care frameworks.</p>	

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# Chapter 5

## Elder Abuse and End of Life



0 This final chapter departs significantly from its predecessors, examining two critical  
1 issues that define life's final stages and pose fundamentally ethical rather than  
2 economic questions. The first explores the vulnerability of frail elderly individuals  
3 to mistreatment during their most defenseless period. The second investigates how  
4 policymakers might best structure end-of-life care frameworks.

### 5.1 Elder Abuse in Vulnerable Populations

6 The shadow of abuse looms darkly over many of our most vulnerable elderly citizens.  
7 This crisis—encompassing physical violence, emotional cruelty, sexual exploitation,  
8 financial predation, and callous neglect—strikes at the heart of our social contract  
9 to protect those who can no longer fully protect themselves. Frailty renders many  
10 elderly individuals particularly defenseless, their physical limitations, and cognitive  
11 decline creating a perfect storm of dependency. According to comprehensive research  
12 published in *The Lancet Global Health*,<sup>1</sup> the statistics paint a disturbing portrait:  
13 nearly 16% of people aged 60 and older have suffered at the hands of those meant to  
14 care for them. This research—drawing from 52 studies across 28 countries—reveals  
15 a troubling pattern: 11.6% endured psychological abuse, 6.8% suffered financial  
16 exploitation, 4.2% experienced neglect, 2.6% faced physical violence, and 0.9% were  
17 victims of sexual abuse. Even vigilant family members often miss the telltale indicators  
18 of abuse, which manifest in various concerning ways. Physical signs appear as  
19 unexplained injuries, untreated medical conditions, or suspicious bruising patterns.  
20 Emotional markers emerge through withdrawal, depression, unusual fearfulness, or  
21 sudden anxiety. Financial exploitation reveals itself in mysterious account changes,  
22 missing valuables, or unauthorized transactions. Neglect becomes evident in unsafe

<sup>1</sup> [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(17\)30006-2/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(17)30006-2/fulltext).

23 living environments, inadequate nutrition, inappropriate clothing, or untreated medical  
24 issues like bedsores. The problem extends beyond individual cases to systemic  
25 failures. In France, Vincent Castanet’s explosive expos triggered nationwide outrage  
26 by documenting how profit-driven care facilities routinely sacrifice resident dignity  
27 for financial gain.<sup>2</sup> This scandal forced political leaders to confront the urgent need  
28 for nursing home reform.

29 A Michigan study<sup>3</sup> revealed the shocking prevalence of staff-perpetrated abuse,  
30 with nearly one-quarter of nursing home residents reporting at least one incident of  
31 physical violence from caregivers. This research identified key risk factors: limita-  
32 tions in activities of daily living, behavioral challenges, and previous victimization  
33 all significantly increased abuse likelihood. While these studies focus primarily on  
34 institutional settings, family-based elder abuse remains distressingly common. We  
35 can identify factors contributing to abuse; however, nothing justifies mistreatment of  
36 vulnerable elders. The institutional failures stem largely from chronic understaffing  
37 and inadequate training—problems especially acute in private facilities where profit  
38 motives drive aggressive cost-cutting. In America, many unqualified nursing assis-  
39 tants earn more at fast-food establishments than caring for our elderly. Better com-  
40 pensation, benefits, and training would bring dignity to this essential work while  
41 reducing abuse incidents<sup>4</sup>

42 Though profit-seeking often bears blame, Dewatripont (2023) proposes transform-  
43 ing listed companies into “mission companies”—legal structures balancing share-  
44 holder interests with those of residents and staff. However, elder abuse pervades  
45 non-profit facilities and family settings as well, suggesting deeper underlying issues.  
46 Domestic abuse frequently results from the toxic combination of heavy dependency  
47 and inadequate living conditions. Yet even with improved staffing and family support,  
48 certain difficult scenarios would persist. Two particularly challenging situations defy  
49 easy solutions: First, cases where dependent individuals display consistently mali-  
50 cious behavior testing even the most patient caregiver’s limits. Second, the common  
51 scenario where dementia combined with incontinence creates overwhelming care-  
52 giving demands. Home care in these situations carries extreme risks, potentially  
53 destroying caregivers’ physical and mental health. Institutionalization becomes nec-  
54 cessary, but requires sufficient qualified staff to manage these exhausting cases.

55 One partial answer may lie in robotic assistance technologies, which offer the sig-  
56 nificant advantage of never experiencing frustration or exasperation—much like a  
57 GPS system remaining perpetually calm despite repeated user errors. Truly address-  
58 ing elder abuse demands vigilance, education, and proactive engagement from care-  
59 givers, families, and communities alike. By recognizing warning signs early and  
60 implementing preventative measures systematically, we can better protect our elderly  
61 from harm while ensuring they receive the respect and dignified care they deserve.

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<sup>2</sup> Castanet (2022).

<sup>3</sup> <https://www.michigan.gov/ag/initiatives/elder-abuse>.

<sup>4</sup> <https://nap.nationalacademies.org/catalog/26526/the-national-imperative-to-improve-nursing-home-quality-honoring-our>.

62 The role of assistive technologies isn't substitution but intelligent complemen-  
 63 tation. Technologies can handle routine, repetitive, and monitoring tasks, freeing  
 64 caregivers to focus on the irreplaceable human elements—emotional connection,  
 65 complex decision-making, and meaningful interaction. Sensors, wearable devices,  
 66 and smart home systems can continuously track vital signs, detect falls, monitor  
 67 medication adherence, and identify changes in daily routines that might signal health  
 68 issues. This augments what a caregiver can observe during limited visits and enables  
 69 earlier intervention. A caregiver visiting twice daily can effectively “extend” their  
 70 presence through these systems. Exoskeletons and robotic lifting devices can reduce  
 71 the enormous physical strain on caregivers, preventing injuries that force people  
 72 out of care work. Transfer assists, mobility aids with AI navigation, and even more  
 73 advanced robots that help with dressing or bathing could emerge. These don't replace  
 74 the caregiver but make their work sustainable. For individuals with dementia or cog-  
 75 nitive decline, technologies like medication reminders, GPS tracking for wandering  
 76 prevention, interactive memory aids, and even social robots that provide compani-  
 77 onship and cognitive stimulation can fill gaps between caregiver visits. Some studies  
 78 suggest social robots reduce loneliness and agitation.<sup>5</sup>

## 79 5.2 End of Life<sup>6</sup>

80 The twilight of human existence—that delicate transition we call the end of life—  
 81 demands our deepest attention when examining disability and dependence in old  
 82 age. Death might arrive suddenly like a thief in the night, or it may announce itself  
 83 through a prolonged procession of decline and suffering. Across the globe, societies  
 84 have crafted vastly different approaches to this universal passage, each reflecting  
 85 cultural values, economic realities, and ethical frameworks. The modern challenge  
 86 lies in finding the optimal balance between state involvement, market mechanisms,  
 87 and family responsibility during life's final chapter. Our current medical paradigm  
 88 often defaults to aggressive interventions, extending life at any cost. Yet a compelling  
 89 case emerges for redirecting our focus toward comprehensive palliative care—an  
 90 approach that promises to reduce social insurance burdens, lighten families' financial  
 91 loads, and most crucially, spare patients from unnecessary suffering during their final  
 92 days.

93 The very concept of planning for life's end is relatively new in human history.  
 94 Merely a century ago, discussions about pension systems rarely entered public dis-  
 95 course, as average life expectancy hovered below 65 years. The demographic reality  
 96 meant few individuals lived long enough to require extended retirement support. As  
 97 longevity increased, however, pension policy quickly ascended to the forefront of  
 98 social priorities. This dramatic shift in lifespan simultaneously triggered a cascade  
 99 of age-related disabilities, forcing societies to confront questions of dependency and

<sup>5</sup> See, e.g., Lee et al. (2025) and Pu et al. (2019).

<sup>6</sup> This section is based on Perelman and Pestieau (2024).

100 diminished autonomy through long-term care initiatives. More recently, attention  
 101 has shifted toward end-of-life concerns—a term that resists simple definition. When  
 102 precisely does this final phase begin? For the young adult tragically lost in a high-  
 103 way collision, the end arrives in an instant. Many healthcare systems consider this  
 104 phase initiated when recovery hopes vanish, triggering specialized care protocols  
 105 often accompanied by extraordinarily generous reimbursement structures.

### 106 **5.2.1 Medicalization of End-of-Life Care**

107 The end-of-life period begins at the point at which there can be no further recovery  
 108 or cure, and the only way out is death. During this period, there should be a change  
 109 in the type of healthcare provided. Most healthcare systems and traditional medical  
 110 approaches focus on curative interventions. While curative care aims to improve  
 111 and prolong quality of life, not all illnesses are curable. Curative interventions for  
 112 incurable diseases may not prolong life or improve its quality. What's more, they are  
 113 often costly for individuals, their families, and healthcare systems as a whole. These  
 114 healthcare systems are focused on healing, and tend to keep patients alive, even at  
 115 the cost of pain, suffering and a deterioration in their quality of life, regardless of  
 116 the expected success of the care. Preparing or planning for death remains outside the  
 117 normal care process, leaving people with terminal illnesses with limited opportunity  
 118 to choose the level of medical intervention they prefer. So, instead of focusing on  
 119 intensive procedures with little clinical benefit and no improvement in quality of life,  
 120 some research is now concentrating on the “quality of death.” This section compares  
 121 the quality of palliative care in different countries.

122 The period preceding admission to palliative care is sometimes a time when family  
 123 and doctors may be tempted, for different reasons, to prolong life, sometimes at the  
 124 price of unbearable suffering for the patient and high costs for families. Many people,  
 125 especially at advanced ages, wish to avoid therapeutic overkill. This is not always  
 126 possible, for two reasons. Firstly, the dividing line between aggressive therapy and  
 127 palliative care is not always clear. Secondly, some doctors, more so in a country like  
 128 the USA than in Belgium or the Netherlands, take the Hippocratic oath to the letter.  
 129 As this oath says, “I will not administer a poison to anybody when asked to do so,  
 130 nor will I suggest such a course.” As a result, many doctors are unwilling to resign  
 131 themselves to their patient's death through assisted suicide, as long as there is hope  
 132 of keeping him or her alive. It is in the name of this oath that they are reluctant, even  
 133 opposed, to euthanizing their patient, even where this is perfectly legal and despite  
 134 the patient's wishes.

135 In broad terms, palliative care is any treatment or intervention intended to control  
 136 pain or other distressing symptoms. Palliative care can be provided in an institution  
 137 such as a hospice or outside of hospice. In hospice, palliative care aims to relieve suf-  
 138 fering by managing physical symptoms such as nausea, shortness of breath, and con-  
 139 stipitation that may be caused by the illness or result from side effects of medication.  
 140 Hospice-based palliative care also addresses other issues such as anxiety, insomnia,

141 or depression. Some hospices offer complementary therapies such as healing touch,  
 142 meditation, aroma therapy, music therapy, and pet therapy. Non-denominational,  
 143 non-judgmental hospice chaplains offer an opportunity for spiritual exploration and  
 144 discussion.

145 Palliative care outside of hospice may be used during any point in the illness.  
 146 Patients may receive palliative care while they receive treatment aimed at curing or  
 147 slowing the progression of their disease. Sometimes such treatments (e.g., chemother-  
 148 apy, radiation, etc.) can be better tolerated with the help of palliative care, making  
 149 it a good option for people who are not in the final stages of illness but who desire  
 150 expert pain and symptom management.

### 151 5.2.2 *The Costs*

152 It is important to note that the costs of end-of-life care can be influenced by factors  
 153 such as the availability of palliative care services, the prevalence of advance care  
 154 planning and the use of aggressive medical interventions. The USA often has higher  
 155 end-of-life care costs than many other developed countries. This is partly due to the  
 156 widespread use of aggressive medical interventions, a fee-for-service healthcare sys-  
 157 tem and a cultural tendency to pursue life-prolonging treatments. In contrast, Euro-  
 158 pean countries such as the Netherlands and Belgium have well-established palliative  
 159 care programs. In these countries, end-of-life care may focus more on improving  
 160 patients' quality of life than on aggressive medical interventions. That said, there are  
 161 variations between countries in terms of their stance on the issue of end-of-life care.  
 162 The example of Canada is interesting. Here, the healthcare system is publicly funded,  
 163 and it takes several months to get most medical appointments. However, as soon as a  
 164 patient is declared to be EOL (end of life), these barriers come down. They have the  
 165 right to unrestricted end-of-life care. This care can be provided on the premises of a  
 166 palliative care home or at home. This contrast between limited access to health care  
 167 before the end of life and unrestricted access after the patient is deemed to be at the  
 168 end of life is found to a greater or lesser extent in most countries. The reasons for this  
 169 difference in treatment are open to question. Could it be a way for the state to com-  
 170 pensate individuals for their impending death? Even if the out-of-pocket expenses  
 171 can be substantial, health care at the end of life is for the most part covered by social  
 172 insurance. Clearly, the decision to enter palliative care remains the responsibility of  
 173 the patient and his or her family. However, this decision has a definitive budgetary  
 174 impact. A recent study<sup>8</sup> conducted in Canada shows that increased use of palliative  
 175 care services should lead to a reduction in end-of-life costs.

<sup>8</sup> Cost-effectiveness of palliative care (2022) <https://www.acsp.net/wp-content/uploads/2024/01/TWF-Cost-Effectiveness-Documents-de-travail-FR>.

### 176 5.2.3 *The Family*

177 The quality of end-of-life care, whether at home or in an institution, often depends  
 178 on the family circle. The family plays a decisive and, more often than not, positive  
 179 role. Being surrounded by loved ones is comforting. The end of life is undoubtedly  
 180 the time of life when people feel most vulnerable and fragile. To be able to count on  
 181 the loving, selfless assistance of loved ones to protect them is essential, especially in  
 182 the case of mental degeneration. The family can protect the individual from herself  
 183 (falls, injuries...) or from others (abuse of weakness), but care must be taken not to  
 184 go too far and to respect the patient's principle of self-determination. This means  
 185 respecting their ability to decide for themselves, and to be free to make their own  
 186 choices for as long as possible. Being old doesn't mean being incompetent or a  
 187 sub-citizen, especially when you still have all your wits about you. And even with  
 188 cognitive diseases such as Alzheimer's, it's perfectly possible to continue to make  
 189 one's own choices up to an advanced stage. Unfortunately, this is not guaranteed.

190 A troubling paradox emerges when children genuinely believe they're acting in  
 191 their parent's best interest—investing enormous energy and making real sacrifices—  
 192 while simultaneously undermining the very person they're trying to help. They over-  
 193 ride expressed preferences, impose their own vision of care without truly listening,  
 194 use their role to maintain control or fulfill unexamined psychological needs, and  
 195 become so consumed by physical tasks that emotional needs and dignity fall away.  
 196 The paradox deepens because these caregivers often work themselves to exhaustion.  
 197 Their sacrifice is real, which makes it nearly impossible for them to hear that they  
 198 might be causing harm. They can genuinely love their parent while simultaneously  
 199 mistreating them—not through malice, but through a kind of suffocating devotion.  
 200 This pattern might be called well-intentioned harm or benevolent overreach.

201 Take the following scenario of an old person at the end of her life. She would  
 202 have so much liked her suffering to have been shortened by a dignified euthanasia.  
 203 This was refused by a reluctant family and an obtuse doctor taking advantage of her  
 204 weakened state. Before that, when she still had a good part of her head, she was  
 205 subjected to benevolent overreach. Her children put her in a shabby nursing home  
 206 she didn't want, for her own good of course. Still, for her own good, they put her  
 207 under guardianship, so that she no longer has any control over her income and assets.

208 How do you avoid such hell? It's not easy. Even more complicated than avoiding  
 209 institutional abuse, or even cynical family abuse. In this case, the abuser is convinced  
 210 of his right to do so. He behaves in this way for the good of the dependent person, who  
 211 doesn't know what's good for her. Added to this is the fact that, in extreme cases,  
 212 the legal system always sides with the family. It's clear that once set in motion,  
 213 this infernal scenario cannot be stopped. So, we need to prevent and anticipate.  
 214 The best way to prevent this is undoubtedly to invest emotionally in the family.  
 215 In Asian countries, for example, there has been a change in the way children are  
 216 brought up. Parents are gradually abandoning the strict style of what is known as

217 “tiger parenting”<sup>10</sup> for a style imbued with patience and love, which takes longer but  
 218 ensures that they can count on their children in their old age in case of need.<sup>11</sup>

219 That said, even with the best will in the world, it’s not always possible to avoid such  
 220 altruistic abuse, and it’s important to take action long before it’s too late. The situation  
 221 varies widely from country to country. The proportion of elderly people who have  
 222 a written plan designating a person who will make decisions about their treatment  
 223 ranges from 67% in the USA and 62% in Canada to 16% in the Netherlands.<sup>12</sup> These  
 224 are elementary precautions which, in most cases, will be of no use, as the majority  
 225 of end-of-life situations are, fortunately, more harmonious than those just described.

#### 226 **5.2.4 The Legal and Cultural Dimensions of End-of-Life** 227 **Care: A Global Perspective**

228 End-of-life legislation varies dramatically across national boundaries, creating a  
 229 complex global patchwork of approaches to life’s final chapter. While no juris-  
 230 diction explicitly prohibits aggressive medical intervention—and some healthcare  
 231 systems tacitly encourage such approach—the legal frameworks governing euthana-  
 232 sia and assisted dying reveal profound cultural and ethical differences worldwide.  
 233 The Netherlands and Belgium stand at the progressive edge of this spectrum, per-  
 234 mitting euthanasia under stringent conditions that require both the patient’s explicit  
 235 request and evidence of unbearable suffering. Switzerland has carved out its own  
 236 distinctive approach, legalizing assisted suicide in specific circumstances, with orga-  
 237 nizations like Dignitas and Exit providing these services to individuals with terminal  
 238 illnesses. Canada’s system of Medical Assistance in Dying (MAD) operates under  
 239 precise eligibility requirements, including the presence of a serious, irremediable  
 240 medical condition, while carefully distinguishing between active and passive forms  
 241 of euthanasia.<sup>13</sup> According to a recent comprehensive survey,<sup>14</sup> active euthanasia—  
 242 where medical professionals directly administer life-ending medication—remains  
 243 legal in only eight jurisdictions globally: Australia, Belgium, Canada, Colombia,  
 244 Luxembourg, the Netherlands, New Zealand, and Spain. The more conservative  
 245 approach of passive euthanasia—withdrawing life-sustaining treatment rather than

<sup>10</sup> Tiger parenting is a style of parenting that emphasizes academic achievement, life success, and discipline. Tiger parents are strict and stress the importance of school performance and career development, often by setting high expectations and withholding affection.

<sup>11</sup> See on this Fan et al. (2025).

<sup>12</sup> American Academy of Actuaries (2017), End-of-Life Care in an Aging World: A Global Perspective <https://www.actuary.org/endoflifecare#:~:text=Issues%20surrounding%20end%2Dof%2Dlife,economic%20burdens%20on%20future%20generations.>

<sup>13</sup> Active euthanasia: killing a patient by active means, for example, injecting a patient with a lethal dose of a drug. Sometimes called “aggressive” euthanasia. Passive euthanasia: intentionally letting a patient die by withholding artificial life support such as a ventilator or feeding tube.

<sup>14</sup> World Population Review (2023) <https://worldpopulationreview.com/country-rankings/where-is-euthanasialegal.>

246 actively intervening—enjoys broader acceptance, permitted in Argentina, Chile,  
 247 Finland, Germany, India, Ireland, Japan, Mexico, Portugal, South Korea, Sweden,  
 248 Switzerland, the UK, and several states in the USA. This landscape continues to  
 249 evolve rapidly as more nations contemplate legalizing various forms of assisted  
 250 dying. In France, while assisted dying remains prohibited, vigorous public discourse  
 251 and legislative efforts signal potential change on the horizon. Notably, in jurisdic-  
 252 tions where these practices have been legalized, utilization rates have not surged  
 253 dramatically, contradicting the dire predictions of opponents.

254 The availability of euthanasia offers patients a crucial psychological safety net—  
 255 the reassurance that excessive suffering can be avoided—even when this option  
 256 ultimately goes unexercised. At this point, one could also bring up the increasingly  
 257 popular concept of the death doula. A death doula, also known as a death midwife,  
 258 is a non-medical professional who provides support to individuals and their families  
 259 during the dying process. They offer emotional, spiritual, and practical support,  
 260 helping individuals navigate the end-of-life journey with dignity and peace.

261 This matter naturally intersects with broader discussions on suicide, which dispro-  
 262 portionately affects elderly populations in most countries, despite being the leading  
 263 cause of death among younger demographics. These statistics likely underrepresent  
 264 the true scope of elder suicide, and anecdotal evidence suggests that informal end-  
 265 of-life assistance from primary care physicians occurs more frequently than official  
 266 records indicate. Research has not demonstrated that euthanasia access reduces sui-  
 267 cide rates in the general population.

268 The striking variations in end-of-life care approaches across different societies  
 269 reflect deep-seated cultural, religious, and societal differences. These distinctions  
 270 manifest not only in legal attitudes toward assisted dying but also in the structure and  
 271 accessibility of palliative care services. The same cultural factors shape how differ-  
 272 ent societies honor patient autonomy and self-determination in end-of-life decision-  
 273 making.

274 In countries like France, the geographic distribution of palliative care facilities  
 275 reveals troubling regional disparities, creating fundamental inequities in service  
 276 accessibility. This uneven landscape produces cascading consequences, with vul-  
 277 nerable populations facing disproportionate barriers to essential end-of-life services.  
 278 The stark reality is that socioeconomic status profoundly influences end-of-life care  
 279 quality and options, amplifying broader patterns of inequality at life's most vulner-  
 280 able moment.

### 281 **5.2.5 *Japan and Its Old People***

282 Japan holds a stark distinction in the demography of aging: exceptionally low fertility  
 283 paired with some of the world's longest lifespans. The consequences are staggering.  
 284 The nation's current population of 128 million is projected to contract to 87 million  
 285 by 2060 and just 51 million by 2100. By century's end, nearly 40% of Japanese  
 286 will be over 65. Meanwhile, public debt has reached alarming levels, and the effec-

287 tive retirement age hovers near 70. Yet even with people working into their late  
 288 sixties, the country struggles to sustain its pay-as-you-go pension system. Younger  
 289 generations increasingly feel trapped in an intergenerational squeeze. In a country  
 290 where euthanasia remains illegal, this demographic crisis has sparked some disturbing  
 291 responses. Yusuke Narita, a young economist teaching at Yale University, has  
 292 gained attention by addressing what he calls the “burden” of Japan’s aging society.  
 293 In recent public appearances,<sup>16</sup> he stated bluntly: “I have the impression that the  
 294 only solution is quite clear. In the end, isn’t it mass suicide and mass ‘seppuku’<sup>17</sup> of  
 295 the elderly?” Though thankfully still a minority view, this sentiment has prompted  
 296 artistic pushback. Japanese filmmaker Chie Hayakawa recently released “Plan 75,”  
 297 a dystopian film featuring cheerful salespeople who encourage pensioners to accept  
 298 government-sponsored euthanasia. Hayakawa’s aim was to expose the dangerous  
 299 extremes of gerontophobia—to show where such thinking inevitably leads. Here,  
 300 an important distinction must be made. The current challenge of pension financing,  
 301 while serious, can be addressed through policy without resorting to such barbarism.  
 302 This differs fundamentally from the circumstances of primitive societies where genuine  
 303 resource scarcity meant that the elderly surviving too long could threaten the  
 304 group’s survival. Such ancient practices echo through Japanese folklore, where families  
 305 would abandon their aged parents on remote mountaintops or in forest clearings  
 306 to die. This dark tradition inspired the 1958 film “The Ballad of Narayama” and  
 307 its 1983 remake—both, like “Plan 75,” recognized at Cannes. Rejecting extreme  
 308 solutions doesn’t mean inaction. Japan has other levers at its disposal: immigration  
 309 reform, pro-natalist policies, and adjustments to retirement age. The country simply  
 310 needs the will to pull them.

### 311 5.2.6 Patient Participation

312 Determining the exact amount of costs incurred by patients for end-of-life treatments  
 313 can be difficult, as it depends on a variety of factors, including the healthcare system,  
 314 insurance coverage, individual treatment choices, and the availability of support  
 315 services. In addition, cultural and societal factors can influence the preferences and  
 316 choices of patients and their families at the end of life. The overall cost of end-  
 317 of-life treatments can vary considerably, depending on factors such as the country  
 318 or region, the specific medical interventions required, and the healthcare system  
 319 in place. End-of-life treatments can include palliative care, medications, medical  
 320 procedures, and other supportive care. In many countries, end-of-life care is covered  
 321 by health insurance or state-funded healthcare systems, which can help ease the  
 322 financial burden on individuals and their families. However, out-of-pocket expenses

<sup>16</sup> <https://www.nytimes.com/2023/02/12/world/asia/japan-elderly-mass-suicide.html?searchResultPosition=>

<sup>17</sup> Seppuku is a form of taking one’s own life that was considered honourable among the feudal Japanese samurai class.

323 may still arise for a variety of reasons, including co-payments, uncovered services,  
 324 and certain medications. In some regions where access to healthcare is limited or  
 325 insurance coverage inadequate, individuals and families may bear a greater financial  
 326 burden for end-of-life treatments. The result can be significant disparities in access  
 327 to quality care, and financial strain for families who are already coping with the  
 328 emotional challenges of end-of-life situations. It is essential to bear in mind that  
 329 data on the overall costs of end-of-life treatments may not be readily available or  
 330 accurately documented due to variations in healthcare systems, reporting practices  
 331 and cultural differences. In most countries, the palliative care phase, whether at home  
 332 or in an institution, is fully reimbursed by social insurance. However, before this  
 333 phase, when families and patients are tempted to undergo interventions, whose sole  
 334 aim is to prolong life by a few weeks, the out-of-pocket expenses can be considerable.  
 335 In other words, the relentless pursuit of treatment leads to suffering and expense.

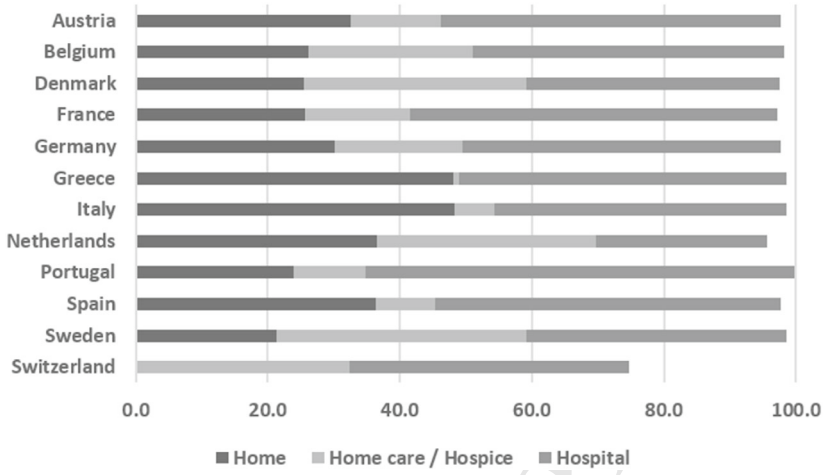
### 336 5.2.7 *Where to Die?*

337 Using data from the European SHARE survey, Orlovic et al.(2017) attempt to compare  
 338 where people die in around 20 countries, i.e., at home, in a nursing home or in  
 339 hospital, with the implication that the latter solution is the costliest for families. They  
 340 show that the increased use of ambulatory long-term care facilities in countries with  
 341 higher public spending on long-term care leads to a reduction in hospital admissions  
 342 and an increase in the proportion of out-of-hospital deaths, compared with countries  
 343 where end-of-life care is mainly privately financed, which tend to have underdeveloped  
 344 and underused formal long-term care facilities. As a result, end-of-life care in  
 345 privately-funded countries is more hospital-based. Focusing on Belgium, Gielen et  
 346 al. (2010) show that life ending in hospitals is more expensive than in palliative care  
 347 centers.

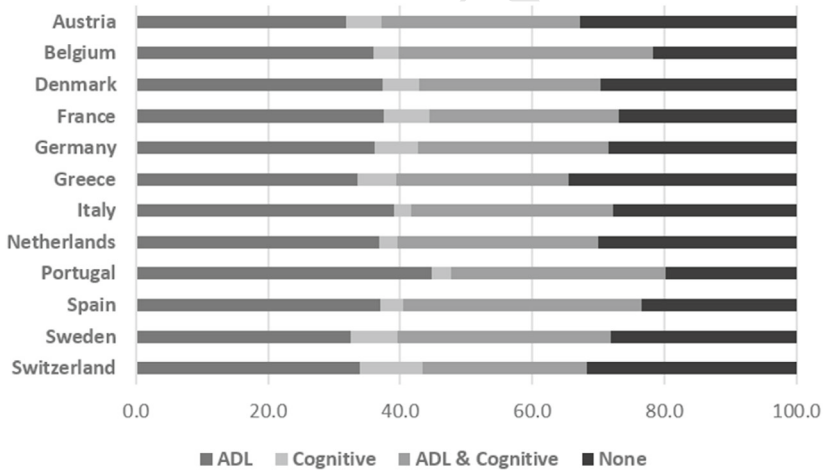
348 Figure 5.1 shows places of death in a sample of European countries using SHARE  
 349 updated data. This figure shows that the fraction of people who are in a nursing  
 350 home or hospice at the time of death is particularly high in Sweden, Switzerland,  
 351 the Netherlands, and Denmark, which are known to have particularly high levels of  
 352 public LTC insurance. In these same countries, the proportion of people dying in  
 353 hospital is relatively low. Of course, age and cause of death—cancer, heart disease,  
 354 respiratory problems or other—are related and can influence the place of death.

355 At the time of death, there are some people who suffer no dependency at all, and  
 356 who are perfectly autonomous. However, they represent a minority, as Fig. 5.2 shows.  
 357 Portugal is the country where people have the most physical or cognitive problems,  
 358 and Greece has the least, followed by Austria and Switzerland. In terms of disabilities,  
 359 we distinguish between limitations in the exercise of daily activities (ADL) and  
 360 cognitive dependencies, separate and combined.

361 It is also interesting to compare countries according to the time spent by individuals  
 362 in an institution of any kind in the last year of life. According to Fig. 5.3, France is  
 363 the country where most people spend the whole of their last year of life at home.



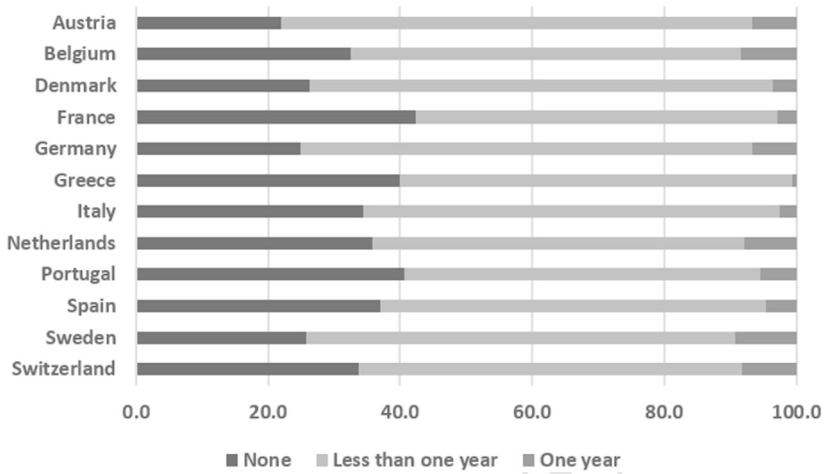
**Fig. 5.1** Place of death in Europe (in %) *Source* SHARE Survey. Own calculations based on information reported by relatives of the deceased respondent (Waves 2–8, 2005–2020)



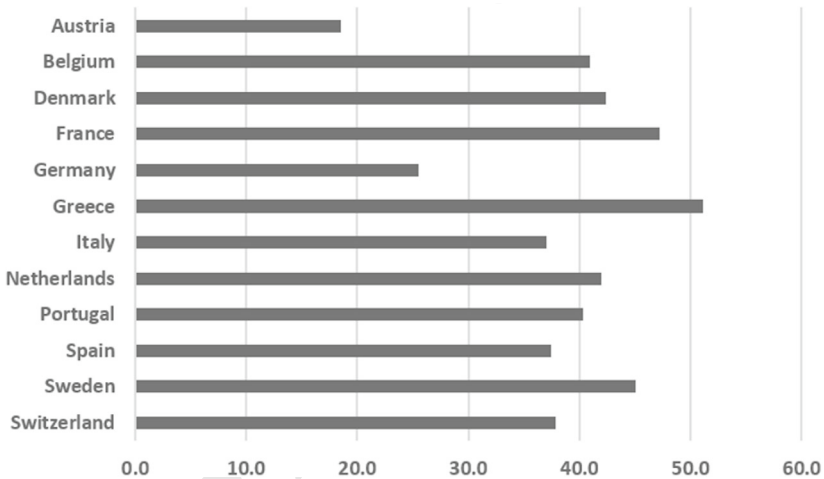
**Fig. 5.2** Type of dependency in the last year of life (in %). *Source* See Fig. 5.1

364 More generally, this trend is found in southern European countries. To the contrary,  
 365 in Sweden and generally northern European countries, people are the most likely to  
 366 spend the last year of their lives in an institution. In Europe, the use of palliative  
 367 care varies greatly from country to country. Figure 5.4 shows data for a sample of  
 368 countries, with variations ranging from 18% in Austria to 52% in Greece for people  
 369 dying over the age of 64. This figure includes palliative care received at home, in  
 370 nursing home, in hospital, and in specialized centers.

Author Proof



**Fig. 5.3** Time spent in an institution during the last year of life (in %). *Source* See Fig. 5.1



**Fig. 5.4** Share of people who used palliative care before dying (aged 65 or over). *Source* SHARE Survey, Waves 7 and 8 (2017–2020)

371 **5.2.8 Need of Reorientation**

372 Among all stages of life, the final phase is marked by heightened vulnerability, both  
 373 physically and emotionally. As individuals approach the end of life, the need for  
 374 tranquility and peace becomes paramount. However, numerous obstacles can hinder  
 375 this pursuit, including the indifference or self-interest of relatives and friends, a  
 376 medical system more focused on cure than comfort, inadequate social support, and  
 377 legal frameworks that fail to fully uphold the dignity of dying individuals. Addressing

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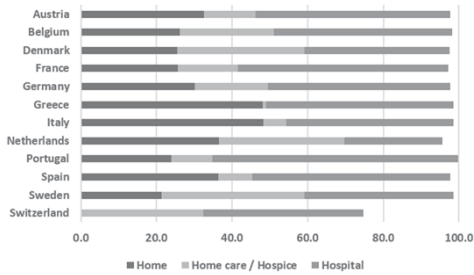
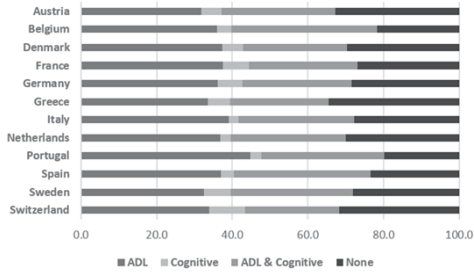
378 these challenges requires a legislative and social support system that prioritizes the  
 379 wishes of patients regarding crucial end-of-life decisions. These include managing  
 380 personal assets, choosing where to spend one's final days, deciding between palliative  
 381 care and euthanasia, or refusing aggressive medical interventions.

382 While some countries have made progress in these areas, much remains to be done  
 383 to ensure that every individual can end their life freely and with dignity. Beyond the  
 384 moral considerations, practical concerns also arise, particularly regarding the grow-  
 385 ing financial burden of end-of-life care on both the state and individual families.  
 386 The suffering associated with this stage is often profound, making it imperative to  
 387 shift toward greater investment in palliative care and a reassessment of conventional  
 388 treatment approaches that frequently result in excessive and futile medical inter-  
 389 ventions. Such a shift would bring multiple benefits: reducing pressure on social  
 390 security systems, alleviating financial strain on families, and most importantly, pre-  
 391 venting unnecessary suffering. Moving toward a patient-centered, dignity-affirming  
 392 approach to end-of-life care is not only a compassionate choice but also a socially  
 393 and economically responsible one.

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Page no	Fig/Photo	Thumbnail	Alt-text Description
11	Fig1	 <p>A horizontal stacked bar chart showing attentional biases for 12 countries. The x-axis represents percentages from 0.0 to 100.0. The y-axis lists countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Sweden, and Switzerland. The legend indicates three categories: Home (dark gray), Home care / Hospice (medium gray), and Hospital (light gray). The bars are stacked from left to right in the order: Hospital, Home care / Hospice, Home.</p>	<p>1Flow chart illustrating attentional biases based on the presence or absence of positive and negative stimuli. The chart is divided into four quadrants:</p> <p>1. Top left (yellow) - "Positive Attentional Bias": Attend to positive stimuli and neglect negative stimuli.</p> <p>2. Top right (green) - "Balanced Attention": Attend to both positive and negative stimuli.</p> <p>3. Bottom left (blue) - "Full Neglect": Neglect both positive and negative stimuli.</p> <p>4. Bottom right (gray) - "Negative Attentional Bias": Attend to negative stimuli and neglect positive stimuli.</p> <p>Arrows indicate the axes: vertical for presence of positive stimuli/events and horizontal for presence of negative stimuli/events.</p>
11	Fig2	 <p>A horizontal stacked bar chart showing attentional biases for 12 countries. The x-axis represents percentages from 0.0 to 100.0. The y-axis lists countries: Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Sweden, and Switzerland. The legend indicates four categories: ADL (dark gray), Cognitive (medium gray), ADL &amp; Cognitive (light gray), and None (white). The bars are stacked from left to right in the order: ADL, Cognitive, ADL &amp; Cognitive, None.</p>	<p>2Flow chart illustrating attentional biases based on the presence or absence of positive and negative stimuli. The chart is divided into four quadrants:</p> <p>1. Top left (yellow) - "Positive Attentional Bias": Attend to positive stimuli and neglect negative stimuli.</p> <p>2. Top right (green) - "Balanced Attention": Attend to both positive and negative stimuli.</p> <p>3. Bottom left (blue) - "Full Neglect": Neglect both positive and negative stimuli.</p> <p>4. Bottom right (gray) - "Negative Attentional Bias": Attend to negative stimuli and neglect positive stimuli.</p> <p>Arrows indicate the axes: vertical for presence of positive stimuli/events and horizontal for presence of</p>

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12	Fig3	<table border="1"> <caption>Data for Fig3: Attentional Biases by Country</caption> <thead> <tr> <th>Country</th> <th>None (%)</th> <th>Less than one year (%)</th> <th>One year (%)</th> </tr> </thead> <tbody> <tr><td>Austria</td><td>20</td><td>20</td><td>60</td></tr> <tr><td>Belgium</td><td>30</td><td>30</td><td>40</td></tr> <tr><td>Denmark</td><td>25</td><td>25</td><td>50</td></tr> <tr><td>France</td><td>40</td><td>20</td><td>40</td></tr> <tr><td>Germany</td><td>25</td><td>25</td><td>50</td></tr> <tr><td>Greece</td><td>35</td><td>25</td><td>40</td></tr> <tr><td>Italy</td><td>35</td><td>25</td><td>40</td></tr> <tr><td>Netherlands</td><td>35</td><td>25</td><td>40</td></tr> <tr><td>Portugal</td><td>35</td><td>25</td><td>40</td></tr> <tr><td>Spain</td><td>35</td><td>25</td><td>40</td></tr> <tr><td>Sweden</td><td>25</td><td>25</td><td>50</td></tr> <tr><td>Switzerland</td><td>30</td><td>20</td><td>50</td></tr> </tbody> </table>	Country	None (%)	Less than one year (%)	One year (%)	Austria	20	20	60	Belgium	30	30	40	Denmark	25	25	50	France	40	20	40	Germany	25	25	50	Greece	35	25	40	Italy	35	25	40	Netherlands	35	25	40	Portugal	35	25	40	Spain	35	25	40	Sweden	25	25	50	Switzerland	30	20	50	<p>3Flow chart illustrating attentional biases based on the presence or absence of positive and negative stimuli. The chart is divided into four quadrants:</p> <p>1. Top left (yellow) - "Positive Attentional Bias": Attend to positive stimuli and neglect negative stimuli.</p> <p>2. Top right (green) - "Balanced Attention": Attend to both positive and negative stimuli.</p> <p>3. Bottom left (blue) - "Full Neglect": Neglect both positive and negative stimuli.</p> <p>4. Bottom right (gray) - "Negative Attentional Bias": Attend to negative stimuli and neglect positive stimuli.</p> <p>Arrows indicate the axes: vertical for presence of positive stimuli/events and horizontal for presence of negative stimuli/events.</p>
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12	Fig4	<table border="1"> <caption>Data for Fig4: Attentional Biases by Country</caption> <thead> <tr> <th>Country</th> <th>Percentage (%)</th> </tr> </thead> <tbody> <tr><td>Austria</td><td>18</td></tr> <tr><td>Belgium</td><td>42</td></tr> <tr><td>Denmark</td><td>45</td></tr> <tr><td>France</td><td>52</td></tr> <tr><td>Germany</td><td>25</td></tr> <tr><td>Greece</td><td>55</td></tr> <tr><td>Italy</td><td>38</td></tr> <tr><td>Netherlands</td><td>42</td></tr> <tr><td>Portugal</td><td>40</td></tr> <tr><td>Spain</td><td>38</td></tr> <tr><td>Sweden</td><td>45</td></tr> <tr><td>Switzerland</td><td>38</td></tr> </tbody> </table>	Country	Percentage (%)	Austria	18	Belgium	42	Denmark	45	France	52	Germany	25	Greece	55	Italy	38	Netherlands	42	Portugal	40	Spain	38	Sweden	45	Switzerland	38	<p>4Flow chart illustrating attentional biases based on the presence or absence of positive and negative stimuli. The chart is divided into four quadrants:</p> <p>1. Top left (yellow) - "Positive Attentional Bias": Attend to positive stimuli and neglect negative stimuli.</p> <p>2. Top right (green) - "Balanced Attention": Attend to both positive and negative stimuli.</p> <p>3. Bottom left (blue) - "Full Neglect": Neglect both positive and negative stimuli.</p> <p>4. Bottom right (gray) - "Negative Attentional Bias": Attend to negative stimuli and neglect positive stimuli.</p>																										
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			stimuli and neglect positive stimuli.\\n\\nArrows indicate the axes: vertical for presence of positive stimuli/events and horizontal for presence of negative stimuli/events.

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Abstract	<p>In the twilight of his life, Baumgartner, the protagonist of Paul Auster’s last novel, reflects on the future that still lies ahead. “Time matters now, and he has no idea how much of it remains. Not just how many years until he ‘kicks the bucket,’ but more precisely, how many years of active, productive life he has left before his mind or body—or both—begin to fail him, turning him into an incompetent fool, wracked with pain, unable to read or think, unable to remember what was said four seconds ago, or summon enough energy to have sex—a horrible thought he does not wish to entertain. Five years? Ten years? Fifteen? The days and months now race past him more quickly, and the time he has left will pass, in any case, in the blink of an eye.” This uncertainty is one of the differences between youth and old age. One can clearly distinguish childhood from adolescence. However, the duration of the two stages of old age—one of good health and autonomy, the other of dependency and various impairments—remains uncertain. It’s true that, on average, in a given country and at a certain time, from the age of 65, the first stage lasts around 10 years, and the second about 8 years. But these are merely statistical averages. On an individual level, the length of old age and the distribution between these two stages can vary enormously.</p>
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# Chapter 6

## Conclusion



Author Proof

0 In the twilight of his life, Baumgartner<sup>1</sup>, the protagonist of Paul Auster’s last novel,  
1 reflects on the future that still lies ahead. ”Time matters now, and he has no idea how  
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14 about 8 years. But these are merely statistical averages. On an individual level, the  
15 length of old age and the distribution between these two stages can vary enormously.

16 Some may lose all autonomy at 65 and live only a few more years, while others  
17 remain independent for decades, experiencing only a short period of dependency.  
18 According to this binary perspective, during the first phase, individuals retain both  
19 physical and mental health, maintain a high level of independence, and actively  
20 engage in social, recreational, and possibly even professional activities. They face  
21 only minor or no health issues, managing them effectively with regular check-ups and  
22 a healthy lifestyle. They often continue exercising, eat a balanced diet, and sustain a  
23 strong social network. They still enjoy hobbies, travel, volunteer, and participate in  
24 family commitments, while their cognitive functions remain sharp. The second phase  
25 is characterized by significant health problems, declining physical and cognitive  
26 abilities, and increased dependence on others for daily activities and care. Chronic

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<sup>1</sup> Auster (2023).

27 diseases, mobility issues, and cognitive decline (such as dementia) become more  
28 common. The elderly may have frequent medical appointments, hospitalizations, and  
29 require continuous medication management. Their participation in previous leisure  
30 and social activities may drastically decrease. Significant support is needed, ranging  
31 from help with daily activities (bathing, dressing, eating) to full-time care. This  
32 support might come from family members, professional caregivers, or assisted living  
33 facilities. In general, the transition from one phase to the other is not abrupt. Most  
34 often, unless there is a sudden event like a stroke, the shift is gradual. Physical and  
35 cognitive decline can be slow, almost imperceptible.

36 There are scales, such as the widely used Katz Index, that help assess a person's  
37 level of dependence and thus determine whether they have entered the second stage  
38 of old age. It is important to note that while we can recognize when an elderly person  
39 shifts into heavy dependence, we cannot predict when they might transition from a  
40 state of well-being to one of unhappiness. It is clear that in the first phase of old age,  
41 there is little need for LTC. On the contrary, by helping their children in caring for  
42 their grandchildren, elderly people can create favorable conditions for care the day  
43 they lose autonomy. The second phase is the period that will need attention. In this  
44 work, we have demonstrated that the demand for long-term care (LTC) will continue  
45 to rise in the coming decades. To meet this growing need, both family and the market  
46 will be crucial. The family appears to play a less significant role than it did in the  
47 past, and the market remains conspicuously absent. This leaves the state as the key  
48 actor. In the future, its involvement will need to increase. We have presented a series  
49 of ideas and proposals aimed at developing a comprehensive social insurance system  
50 to cover the loss of autonomy in the elderly. It is indeed possible to address this rapid  
51 increase in LTC demand, but doing so requires genuine political will.

52 As a final comment, let me address a growing concern shared by many. Most  
53 countries have traditionally met the needs of disabled elderly individuals by relying  
54 heavily on younger generations' contributions. However, with populations rapidly  
55 aging, this intergenerational arrangement faces mounting pressure. The declining  
56 ratio of working-age individuals to retirees raises serious questions about the long-  
57 term viability of this model. If younger generations—already challenged by rising  
58 costs, stagnant wages, and economic uncertainty—become overwhelmed, they may  
59 resist further contributions, creating political and financial strain on welfare systems.  
60 In such circumstances, there exists a genuine risk that governments, struggling to bal-  
61 ance competing demands, may begin neglecting the frail elderly. Budget constraints  
62 could lead to reduced long-term care funding, more restrictive eligibility require-  
63 ments, or an increasing shift of responsibilities to families who may lack the resources  
64 or capacity to provide adequate support. Without proactive policy adjustments—  
65 such as diversifying funding sources, promoting private savings, or implementing  
66 efficiency-driven reforms—this model may become unsustainable, leaving vulnera-  
67 ble populations at risk of inadequate care. Let us hope that the alarming prospect of  
68 societies abandoning their most vulnerable members remains a warning rather than  
69 becoming our reality.

70 **Reference**

71 Auster, P. (2023). *Baumgartner*. NYC: Grove.

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