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Demographic Change and the Future of Austria's Long-Term Care Allowance: A Dynamic Microsimulation study

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Keywords: population ageing, long-term care, long-term care allowance, projections, dynamic microsimulation
JEL codes: C53, I18, J14

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1 Introduction

Population ageing and the associated increase in long-term care (LTC) demand and related costs are becoming pressing issues for policymakers in Europe. Providing reliable projections is all the more essential for anticipating future care demand, guaranteeing financial sustainability through cost control while - as stressed in principle 18 of the European pillar of social rights - ensuring access to affordable high-quality LTC (European Parliament, Council of the European Union, European Commission, 2017).

Broadly speaking, two main approaches are used to project future demand for long-term care: macrosimulation and microsimulation models (Belmonte et al., 2023). Traditional macrosimulation models—such as those employed in the European Commission's 2024 Ageing Report (European Commission, Directorate-General for Economic and Financial Affairs, 2024)—offer valuable cross-country comparability, particularly when harmonised microdata are lacking. These models typically hold age-specific care needs constant over time and apply them to population projections, implying that changes in LTC demand stem solely from demographic shifts. However, such an approach is limited in its ability to reflect structural trends documented in the literature, including educational expansion (Spielauer et al., 2023), delayed ageing, and ongoing mortality improvements (Beltrán-Sánchez et al., 2015; Robine et al., 2020).

In contrast, dynamic microsimulation models offer greater analytical flexibility by simulating individuals' life courses and modeling interactions between health, demographic, and socioeconomic characteristics (Belmonte et al., 2023; Famira-Mühlberger et al., 2025). These models can cover numerous factors influencing the demand and supply of care, and incorporate transitions such as retirement, widowhood, or intergenerational caregiving, allowing for detailed estimates of lifetime care needs, costs and distributional effects. While data intensity and limited comparability have historically constrained microsimulation approaches, recent work using the Survey of Health, Ageing and Retirement in Europe (SHARE) dataset and the microWELT (www.microwelt.eu) platform shows that harmonised, cross-national microsimulation is feasible. These models integrate individual-level factors—such as education, partnership status, and caregiving roles—while remaining consistent with aggregate demographic projections (e.g. EUROSTAT), thereby enabling more realistic and policy-relevant projections of LTC demand and spending.

The overarching aim of this study is to overcome some of the shortcomings of previously used macro-projections. More concretely, focusing on demand-side factors using Austria as a case study, we develop and apply a dynamic microsimulation model to project the evolution of expenditures and lifetime costs for the long-term care allowance (LTCA), a cash benefit that represents a cornerstone of the Austrian LTC system. We present results disaggregated by sex and education — up to the year 2080 under varying scenarios. By using data from SHARE and applying existing Austrian care allowance regulations (which reflect differences in the severity of care needs), the results are expected to provide more granular insights into the (distributional) effects of ageing and other policy-relevant factors on the future demand for the LTCA, using projected prevalence rates across various allowance levels.

To illustrate the flexibility and capabilities of a dynamic microsimulation approach, we contrast different scenarios for the demand for LTC benefits that are well grounded in the literature. Building on our baseline scenario, we both extend and restrict the assumptions posed on care demand. Specifically, we model a scenario without accounting for educational differences and thus for the positive health effect associated with the educational expansion, thus resembling a macrosimulation approach. This allows us to directly compare the differences in forecasts between a standard microsimulation and a macrosimulation-based model that is restricted to demographic factors as drivers of change. Additional scenarios explore changes in assumptions regarding ageing processes, as well as the evolution of mortality rates, highlighting the potential effects of improvements in morbidity and mortality.

Recognizing that public expenditures on LTC are influenced by a complex range of factors affecting both demand and supply, our approach provides a solid foundation for further development. It can be expanded by incorporating additional scenarios that explicitly account for varying epidemiological, demographic, socio-economic and environmental factors, as well as individual habits and variations in service provision (including preventive healthcare) (Belmonte et al., 2023).

The remainder of this paper is organized as follows: Section 2 offers a concise overview of Austria's LTC system, with a particular focus on its key pillar: the care allowance scheme. Section 3 outlines the methodological approach employed in this study. Section 4 presents the results from four distinct LTC scenarios: the baseline, no education expansion, slower ageing (i.e., a compression of care needs alongside improvements in mortality), and constant mortality. Finally, Section 5 offers concluding remarks and discusses implications for policy and future research.

2 The Austrian Long-term Care Allowance

In Austria, people in need of long-term care are supported by the public sector through cash benefits (long-term care allowance, LTCA) and benefits in kind (nursing homes, residential care facilities, home care services). The Austrian LTCA (*Pflegegeld*), introduced in 1993, is a needs-based but non–means-tested benefit. The allowance is a cash benefit to individuals in need of assistance, with higher cash benefits allocated to those with greater care needs, providing a relatively broad coverage (Ranci et al., 2019). It is not limited to older adults but is available to all individuals who require care, regardless of age. Eligibility is determined solely by the assessed need for care due to physical, mental, or psychological impairments expected to last at least six months, with dementia diagnoses triggering an automatic 25-hour care premium in the assessment process (Trukeschitz et al., 2022).

The allowance is paid directly to beneficiaries to help cover additional care-related expenses. There are no restrictions on how recipients use the funds, and there is a legal entitlement to the benefit for those meeting the criteria. Depending on the intensity of care required, the LTCA is divided into seven levels, ranging from €200.80 per month at LTCA level 1 to €2,156.60 per month at level 7 (2025, annually adjusted for inflation). Specific medical conditions including blindness and paraplegia qualify for predefined benefit levels, creating standardized support pathways for these populations.

Table 1: Long-term care allowance in Austria

LTCA level	Criteria	Amount of LTC allowance p.m. in €
1	> 65 hours of care required p.m.	200.80
2	> 95 hours of care required p.m.	370.30
3	> 120 hours of care required p.m	577.00
4	> 160 hours of care required p.m.	865.10
5	> 180 hours of care p.m. if an extraordinary amount of care is required	1175.20
6	> 180 hours of care p.m. if uncoordinated care measures are required, and these must be provided regularly during the day and night, or the permanent presence of a carer is required during the day and night because there is a likelihood of danger to oneself or others	1641.10
7	> 180 hours of care p.m. if no purposeful movements of the four extremities with functional realization are possible or a condition requiring equal attention is present	2156.60

Source: Austrian Ministry of Social Affairs. https://www.oesterreich.gv.at/themen/pflege/4/Seite.360516.html

Approximately 50% of LTCA beneficiaries are in levels 1 and 2 and only 6% are in highest levels 6 and 7. In 2023, an average of about 484,000 people received a LTCA, i. e., 5.2% of the Austrian population. Among those aged 65 (80) or older, 22% (53%) received a LTCA in 2023. 78% of LTCA beneficiaries are 65 years and older, 22% are younger. The LTCA is financed by general federal tax revenues (state budget) and its total cost amounted to €3.1 billion in 2023, i. e. 0.65% of GDP.

Although the LTCA is needs-tested with an assessment of the actual hours of care required per month, it does not fully cover the additional costs of the required care on average (Nagl-Cupal et al., 2018). As it is not linked to benefits in kind, the LTCA can be used either for informal care or for other transfers or private purposes. There is no obligation to document the use of the LTCA. The social policy objective of

the LTCA is to contribute to the additional expenditure resulting from the need for long-term care.

The granting of care allowance and its specific categorization have far-reaching consequences for other benefits in the care sector. Financial support for hiring live-in caregivers ("24-hour care") is only available to people receiving at least care allowance level 3. The new bonus for caregiving relatives, introduced in 2024, is linked to a minimum classification in care allowance level 4. The subsidy for the use of mobile care services is regulated differently in the individual federal states, but in most federal states the amount of the subsidy is linked to the care allowance classification. Admission to a nursing home is also generally linked to a minimum classification in the care allowance system (usually care allowance level 4). Subsidized carer's leave is only possible if the person being cared for is classified at level 3. Finally, social insurance support for carers can only be claimed from care allowance level 3. In summary, the classification in the care allowance system is linked to further support in the care sector and thus has an impact on the eligibility for further subsidies to support people in need of care.

Data show that about 40% of LTCA recipients do not receive public in-kind benefits but are rather exclusively cared for by relatives or other informal caregivers. Thus, the Austrian LTC system is characterised by a rather strong reliance on family and other informal care - stronger than in the Nordic countries but less than in the Southern European countries (Famira-Mühlberger & Leoni, 2024).

The significance of informal care is also reflected in the structure of institutional care: the number of LTC beds in institutions and hospitals per 1,000 population aged 65 and older is slightly above the OECD34 average, yet considerably lower than in other Western European countries, such as the Netherlands and Germany (OECD, 2023). Informal caregivers enjoy several benefits, including paid caregiver leave, direct financial support, and social insurance coverage. When recipients of the LTC allowance access LTC services (in-kind benefits), the individual allowance is typically used to cover these services or the required co-payments. However, the conditions and amounts of these co-payments can vary significantly from one federal state to another.

By the end of 2022, nearly 100,000 individuals were receiving mobile care services, while approximately 68,000 were cared for in residential settings with public co-financing. These figures represent 21% and 14% of LTC allowance recipients, respectively (Pratscher, 2023). Additionally, around 29,000 LTCA recipients relied on self-employed live-in caregivers, predominantly from Eastern European countries, accounting for roughly 6% of all LTCA recipients. Live-in care is primarily financed through users' private funds, including the LTC allowance; however, there is also a means-tested public benefit specifically for live-in care, providing up to €800 per month, along with additional financial support available in some provinces.

Over the past 30 years, the range of residential and community-based care services has significantly diversified and expanded. However, these developments have not kept pace with the increasing demand for care, a situation further compounded by staff shortages. Addressing these staffing challenges has been central to recent LTC reform efforts. Nonetheless, projections indicate that significant shortages will continue unless additional measures are implemented, especially considering the anticipated rise in care needs and the number of care workers expected to retire in the coming years and decades (Famira-Mühlberger, 2023; Juraszovich et al., 2023). While evidence regarding the extent to which LTCA provision meets actual needs in Austria remains limited, studies have identified inequalities in the geographical distribution of LTCA that cannot be solely attributed to the population's age and health status (Famira-Mühlberger et al., 2022; Pennerstorfer & Österle, 2023).

3 Methodology

To project government expenditure on the Austrian care allowance, this paper extends the Austrian dynamic microsimulation model microDEMS by a module . microDEMS is a detailed Austrian implementation of the comparative microsimulation model microWELT[1] that has been used extensively to study the interplay between demography, economy and welfare state (Böheim et al., 2023, 2024; Horvath et al.,

[1] See www.microwelt.eu for further information.

2023; Horvath et al., 2024; Spielauer et al., 2022, 2023) and recently extended for the comparative study of long-term care systems (Famira-Mühlberger et al., 2025; Warum et al., 2025). Sharing its basic architecture with microWELT, microDEMS is an interacting population dynamic microsimulation model set in continuous time. The model uses the Austrian Microcensus (2018) as its starting population and draws on various administrative data sources to provide detailed labour force projections that align with official Austrian population projections from Statistics Austria (Horvath et al., 2025). For this paper, we draw on core microDEMS processes that describe how the Austrian population will evolve by age, sex and education (i.e. fertility, mortality, education and migration) and complement this by cross-sectional imputations for care allowances. Furthermore, we limit our analysis to the population of age 65 and above.

The data source for the parameterisation of the care allowance module are Austrian care allowance statistics for 2021 providing prevalences by age (in years), sex and care allowance level. In addition, we apply Austrian care allowance regulations to a pooled sample from the Survey of Health, Ageing and Retirement in Europe (SHARE) to quantify individual care need in hours, following an approach developed in Warum et al. (2025). Since care allowance levels in Austria are granted largely based on a standardised assessment scheme that assigns hours of care need according to specific limitations (see Table 1), replicating this scheme allows us to place SHARE respondents in the Austrian care allowance system according to their estimated total care needs.

We subsequently proceed with a two-step approach to estimate care allowance parameters. First, we estimate a parameter for receiving any care allowance by age, sex and education (see Figure A.7). We use a fully interacted logit model on having more than 65 hours of care need (the threshold for getting any care allowance) by age, sex and education. Using non-linear optimisation, the resulting predicted log odds by education are then aligned to the care allowance statistics. Second, we estimate a parameter for the prevalence of each care allowance level by age, sex and education. Due to sample size limitations, we split hours of care need in the subsample of respondents with more than 65 hours into only two categories at the threshold of 120 hours. Care levels 1 and 2 thus fall into the lower category and care levels 3-7 fall into the higher category. We then again estimate a logit model with the dichotomous care categories as dependent variable, interacting age with sex and education (Figure A.8). Next, we apply the predicted odds from this equation to each of the seven care levels, aligning education differentials to the prevalence of each care level (Figures A.9-A.15).

To arrive at expenditure projections, we assign care allowance payouts by care allowance level according to official values in 2023. Our projections are thus reported in constant (2023) prices and do not account for inflation. However, we note that since 2020 Austrian care allowance payments are subject to inflation indexation.

4 Projecting long-term care demand

Building on the dynamic microsimulation model detailed in Section 3, this part of the paper develops and analyses four distinct scenarios for LTCA demand. We first outline each scenario (see Section 4.1.) before reporting the corresponding simulation results (see Section 4.2.). For each scenario, we present projections of total expenditures for each of the seven care categories applied within the Austrian care allowance scheme, as well as cumulative expenditures up to the year 2080. Additionally, we provide estimates of lifetime LTCA costs per person aged 65 and over, disaggregated by sex and education level, along with projected prevalence rates of each care category by the year 2080.

4.1 Defining scenarios

The *baseline scenario* (S0, see Table 1) is a prediction based on status quo assumptions for care demand, with individual receipt of care allowance (and its amount across the varying allowance levels) by age, sex and education held constant over time. Utilizing population projections by Statistics Austria, the primary drivers of changes in both individual and aggregate receipt of care allowance and the classification into each benefit category are demographic shifts — particularly changes in the size and age structure of the

population aged 65 and over. Associated with a growing need for LTC, these shifts are mainly driven by population aging and increased life expectancy. The only mitigating factor in this scenario is the expansion of education. We assume that the currently observed patterns persist, that is, that individuals with higher levels of education are less likely to require care and tend to have lower care needs in hours (by having a lower probability of receiving care allowance and a higher probability of falling into a lower level category if needed). Increasing educational attainment confers substantial health advantages through higher income, better health literacy, healthier behaviours, better working conditions and stronger psychosocial resources (Cutler & Lleras-Muney, 2010)(Zajacova & Lawrence, 2018). A corresponding increase in the share of the 65+ population with higher education levels in the future is therefore expected to have a dampening effect on care demand and associated LTCA costs.

The aim of the scenario analysis is to test the sensitivity of the results to changes in various parameters and to demonstrate the capabilities and flexibility of a microsimulation approach for predicting future care demand and costs, particularly in contrast to previously used macrosimulation models (Famira-Mühlberger, 2023). Starting from our baseline scenario, we thus both expand as well as further reduce the assumptions posed on the demand for LTC. By not taking into account educational differences in care needs, the *no education expansion scenario* (S1) follows the basic idea of a macrosimulation model, as it eliminates the mitigating effect of educational expansion.

Finally, both the *slower ageing scenario* (S2) and the *constant mortality scenario* (S3) represent alternative outlooks for population health and care demand. While S2 projects a slower increase in both the demand for care and the severity of care needs (and corresponding allowance categories) through a decelerated ageing process, S3 is based on the assumption of constant mortality (by age and sex). A comparison of S3 with S0 thus highlights the effects of ongoing improvements in mortality. Conversely, S2 assumes that individuals not only live longer, but also in better health. In this scenario, we define a person's care age such that from 65 onward, a person ages 4 years in 5 years for care-related processes (having a birthday only every 1.25 years). A person aged 70 will then have a "care age" of 69, a person aged 75 will be 73... and 90 will be the new 85, thus adjusting age to increasing life expectancy. Put differently, while the baseline scenario implicitly assumes that individuals live longer but have more years with care needs (expansion of morbidity), the comparison to S2 highlights the potential mitigating effect of health improvements despite increasing life expectancy (compression of morbidity) (Gruenberg, 1977; Robine et al., 2020)

Table 2: Care demand scenarios

Scenario	**Name**	**Care demand assumptions**
S0	*Baseline*	• Demography as in official population projections by Statistics Austria • Education expansion • Constant prevalences for care allowance takeup and levels by age, sex, and education
S1	*No education expansion*	• "Switching off differences in LTCA prevalences by education and thus the mitigating effects of educational improvements (prevalences for care allowance takeup and levels by age and sex only)
S2	*Slower ageing*	• Care needs grow at a slower rate with age (a person ages 4 years in 5 years)
S3	*Constant mortality*	• Mortality by age and sex as of today (no gains in life expectancy)

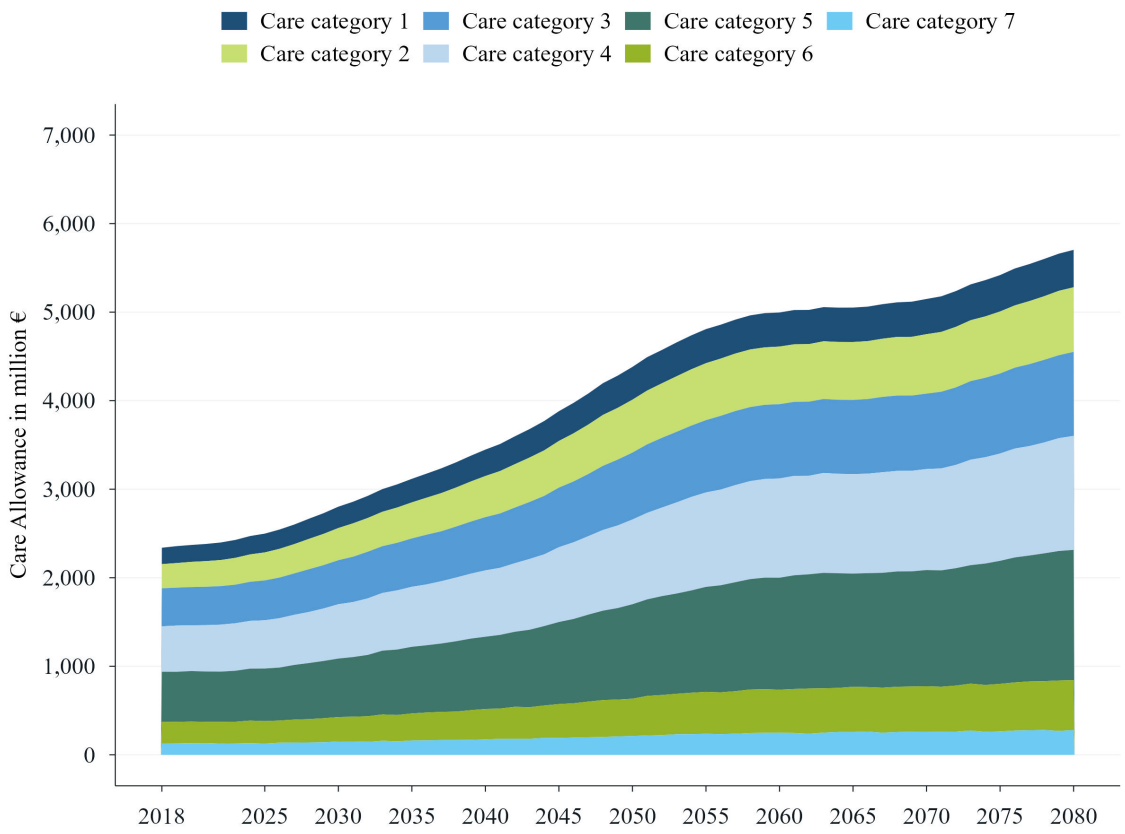
4.2 Results: The importance of education and health in projecting long-term care demand

This section presents and analyses the main findings from the dynamic microsimulation. Starting with projections based on the baseline scenario (S0), we proceed with a comparative assessment in which each subsequent scenario (S1 to S3) is analysed relative to the baseline (S0). The primary objective is to highlight differences in the projections across scenarios, rather than to evaluate each scenario in isolation. For instance, our interest lies not only in the absolute increase in total expenditures within a given scenario, but in how each scenario potentially shifts demand relative to the baseline. For each, we provide estimates of total expenditure, lifetime costs (by sex and education) and future long-term care allowance prevalence rates. For further detail, we provide statistics on life expectancy and prevalence of each care category as of today (see Figure A.1 - A.2) along with the absolute number of projected cases for each scenario (see Figure A.3 - A.6) in the Appendix of this paper.

According to our baseline scenario (assuming demographics as in the official population projections and a composition effect due to the expansion of education, see Table 2), total LTCA spending on people aged 65 and over is projected to increase from €2.3 billion in 2018 to €5.7 billion in 2080 (see Figure 1). Please note that our projections refer only to the population aged 65+ and thus do not cover the costs associated with the LTCA for the whole Austrian population (€3.1 billion in 2023). Notably, the increase in expenditures is driven by a surge across all categories of the care allowance scheme, with a particularly high concentration of costs in categories 4 and 5. As presented in Figure 1, expenditures in these categories will increase two and a half times over, from €0.5 billion in 2018 to €1.3 billion in 2080 in care category 4 and from €0.6 billion to €1.5 billion in care cateogory 5.

In the base scenario, we see a rise in expected cases from 353,000 cases in 2018 to 854,000 cases until 2080. The relative share of each care category remains very similar, with the first two categories accounting for nearly half of all cases (see Figure A.3).

Figure 1: Total LTCA expenditure by category – Base



Source: WIFO.

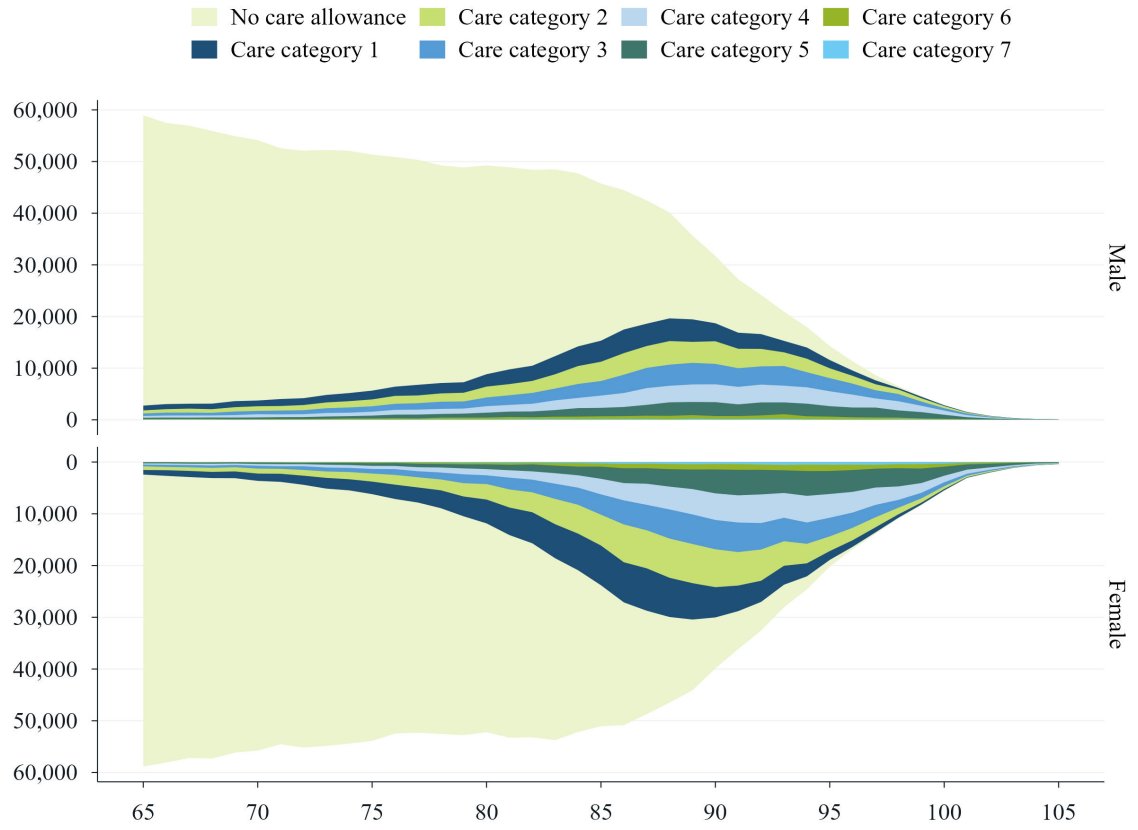
Figure 2 illustrates the lifetime LTCA costs for a person who is currently 65 years old, categorized by education and sex, based on base scenario assumptions. Individuals with lower education levels face significantly higher overall lifetime costs. This disparity is evident for both sexes, but is particularly pronounced among women. In contrast, the differences in lifetime costs between older adults with medium and high educational attainment are relatively small.

Figure 2: Lifetime LTCA costs per person 65+ (now 65) by gender and education – Base

Source: WIFO.

Similarly, Figure 3 highlights a significant increase in the prevalence of care needs of individuals aged 65 and older, as evidenced by the rising number of care allowance recipients (for comparison with 2020, please refer to Figure A.2). This increase occurs gradually with age, reaching its peak around age 88. The trend is particularly pronounced among women, although a notable rise in uptake is also observed among men.

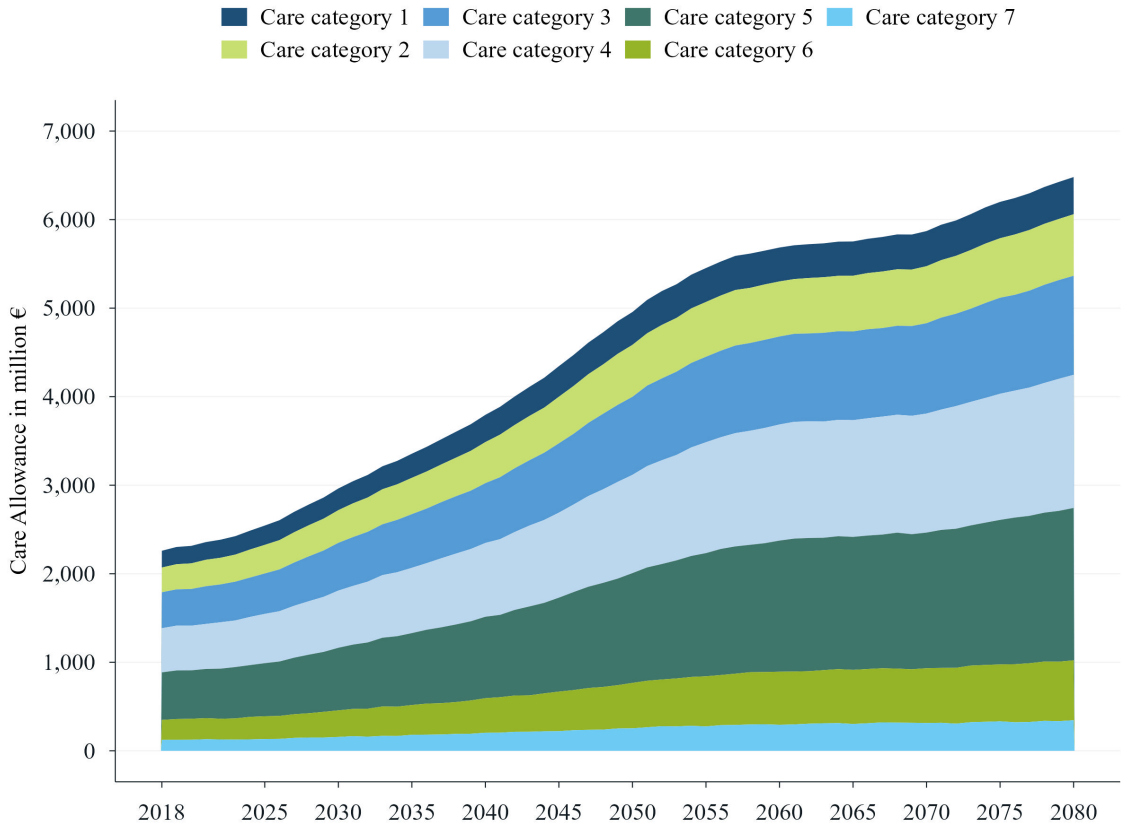
Figure 3: LTCA Prevalence 2080 – Base



Source: WIFO.

A comparison between the *baseline scenario* (Figures 1-3) and the *no education expansion scenario* (Figures 4-6) demonstrates the potential mitigating effects of educational expansion. It also underscores the advantages of a microsimulation model over a macrosimulation-based approach, which is limited in its ability to fully capture this need-reducing effect. Total LTCA expenditures are projected to increase by approximately 187% in scenario 1 (S1), compared to 144% in scenario 0 (S0). In absolute numbers, when accounting for population ageing without considering the potential impact of educational expansion, total expenditures nearly triple, reaching almost €6.5 billion in 2080 (see Figure 4). The difference between scenario S1 and the base scenario S0 thus corresponds to almost €0.8 billion in 2080 (+13.6%).

Figure 4: Total LTCA expenditures by category – No education expansion



Source: WIFO.

While average lifetime costs are only marginally higher (approximately €40,000) in the scenario reflecting a macrosimulation model (S1, as shown in Figure 5) than in the baseline, the distribution of costs across educational groups differs significantly from that of the baseline scenario. In fact, the distribution reverses when the positive effects of education on the need for care are not taken into account (see Figures 2 and 5).

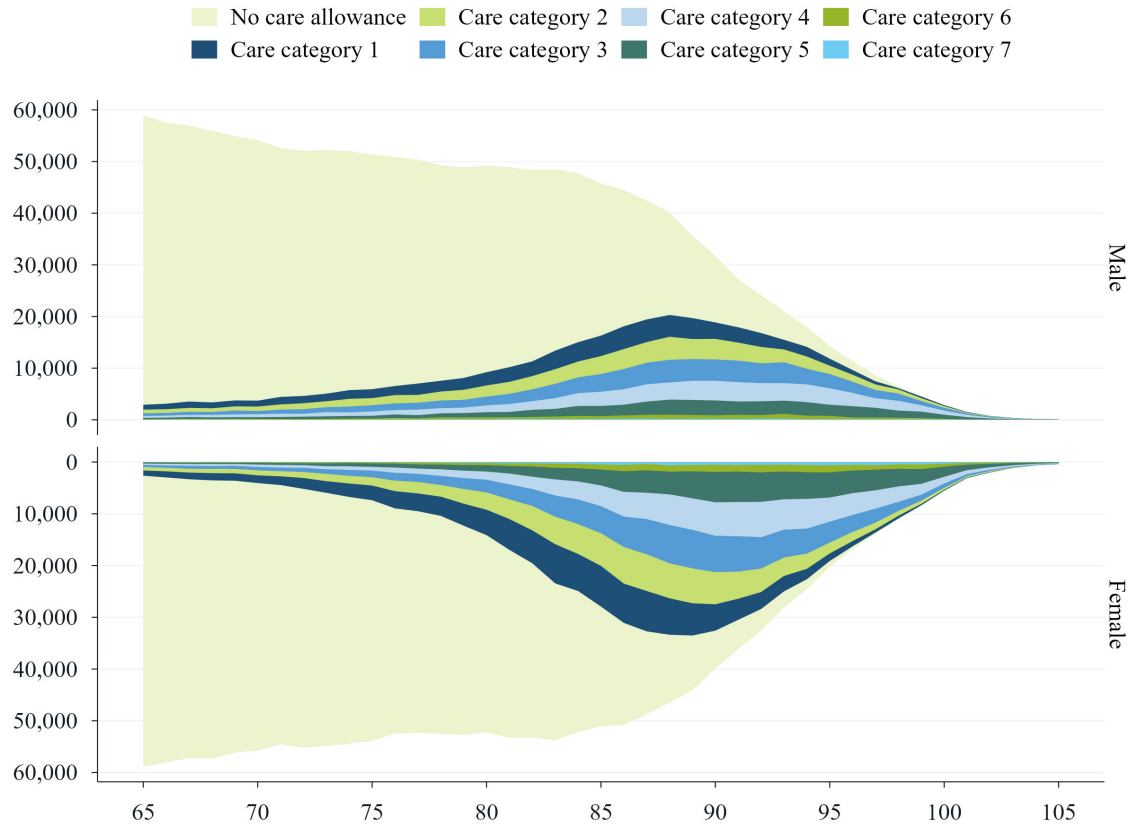
While in Figure 2 we observe a 'pro-lower-education' gradient in lifetime costs (with higher public expenditures for low educated older adults), the opposite is evident in Figure 5, displaying total lifetime costs under S1. When education is not taken into account, higher educated individuals (as shown in Figure 5) incur higher lifetime costs than low educated individuals. This is driven by longer life expectancies (and potential years in poor health), which result in higher cumulative LTC costs. Additionally, sizeable differences by sex are reported in S1. Lifetime costs for highly educated females amount to nearly €60,000, while those for equally educated males total around €38,000. Yet, for both scenarios, the largest gap in lifetime costs between men and women is observed among the group with the lowest level of educational attainment.

Figure 5: LTCA Lifetime costs in Euro per person 65+ (now 65) – No education expansion

Source: WIFO.

Figure 6 shows the projected prevalence rates of LTCA categories in S1 by 2080. These projections confirm the sex-related disparities reported previously (see Figure 5) and the broader differences observed between scenarios S0 and S1. There are significantly higher prevalence rates when the effect of education is not taken into account (compare Figures 3 and 6).

Figure 6: LTCA Prevalence 2080 – No education expansion



Source: WIFO.

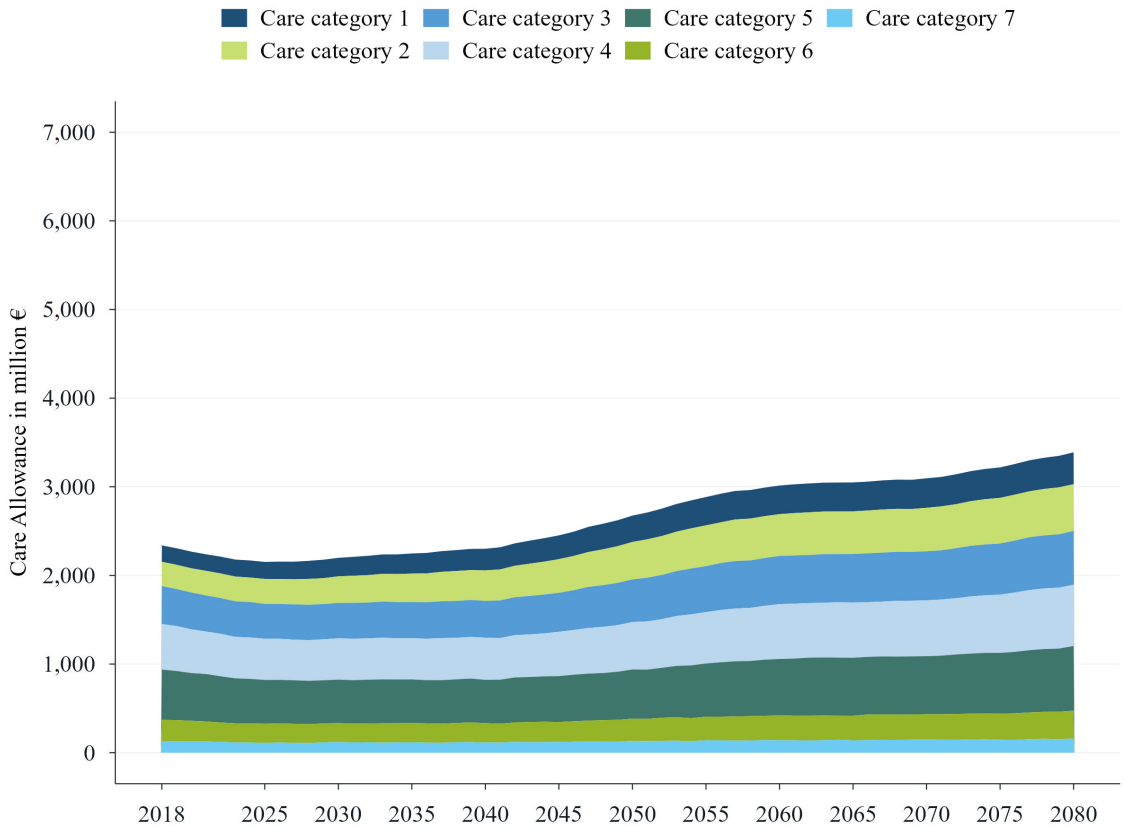
Further illustrating the capabilities of dynamic microsimulation modeling, Figures 7-9 and Figure 10-12 show forecasts based on two additional scenarios, 'slower ageing' (S2) and 'constant mortality' (S3). While the scenario displayed in Figure 7 applies decelerated ageing, stretching individual ageing by assuming that, due to improvements in morbidity, care needs and hours grow more slowly with age, the scenario displayed in Figure 10 shows a situation in which mortality rates by age and sex are hold constant over time. The slower ageing scenario can thus be viewed as comparatively more optimistic, predicting lower overall expenditures than the baseline scenario S0. Total expenditure is projected to increase by 45% to almost €3.4 billion by 2080 (€2.3 billion, which is 40% less than in scenario S0).

Projections under scenario S3 - assuming constant mortality and no gains in life expectancy - remain the lowest in terms of expenditures, with an increase of only 29% over the projection period. As reported in Figure 10, total expenditure is expected to rise from €2.3 billion to around €3 billion by 2080 in this scenario. This highlights that approximately 80% of the €3.4 billion increase in LTCA costs projected at the baseline are the consequence of a higher life expectancy. Notably, total expenditures in S3 are expected to peak around the year 2056, with the babyboomers reaching older ages, before gradually declining thereafter.

Finally, Figures 8 and 11 confirm the previously observed 'pro-lower-education' gradient in lifetime costs, further underscoring the predictive strength of the education composition effect as captured by the dynamic microsimulation model. Total lifetime costs are significantly higher for the lower educated older

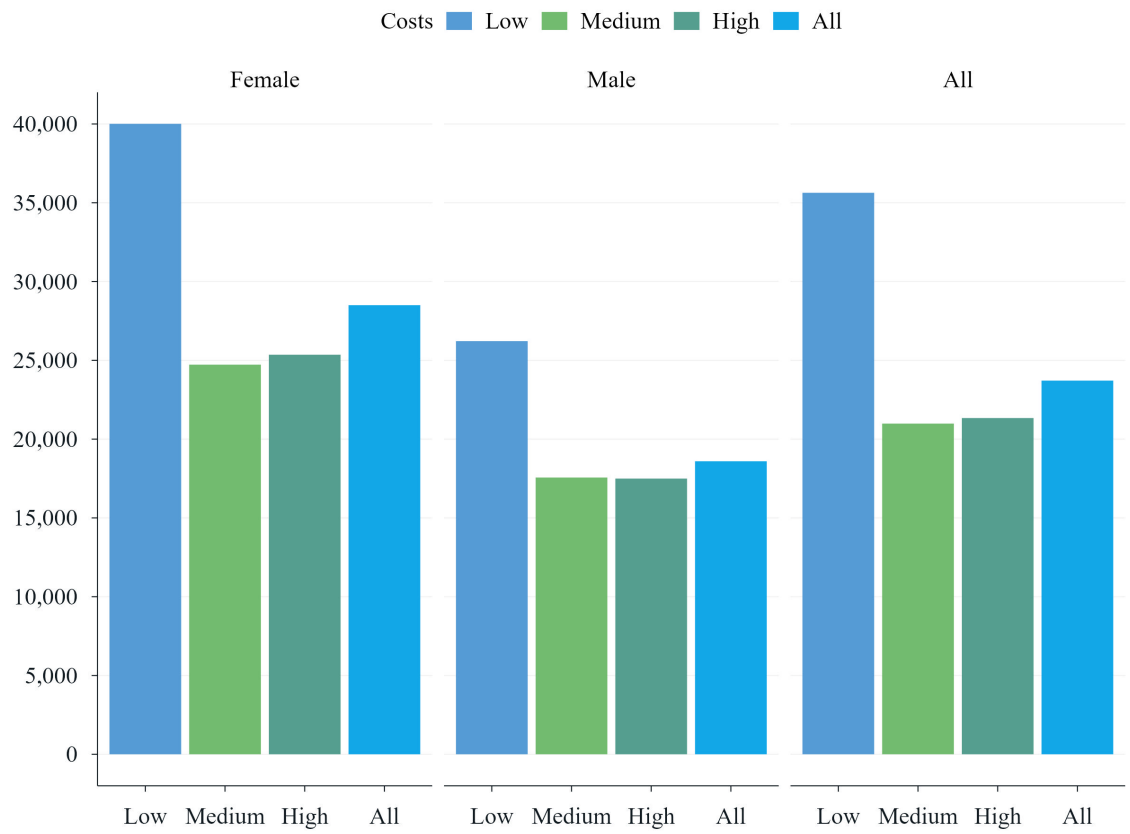
adults than for those with medium or high education. For all education groups, costs are projected to be lower under both the slower ageing and constant mortality scenarios compared to the baseline scenario (under slower ageing because of healthier lives, under constant mortality because of shorter lives). The LTCA prevalence rate figures (Figure 9 & Figure 12) corroborate the broader trends observed.

Figure 7: Total LTCA expenditures by category – Slow aging



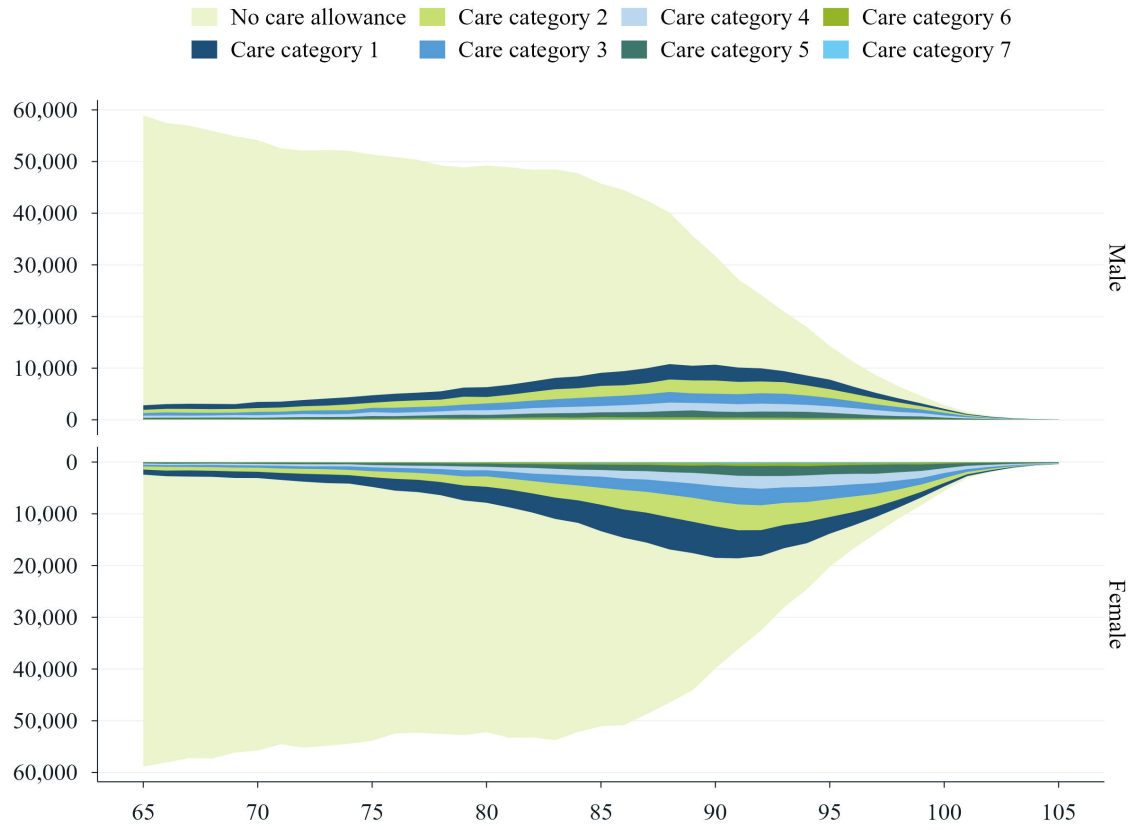
Source: WIFO.

Figure 8: LTCA lifetime costs per person 65+ (now 65) – Slow aging



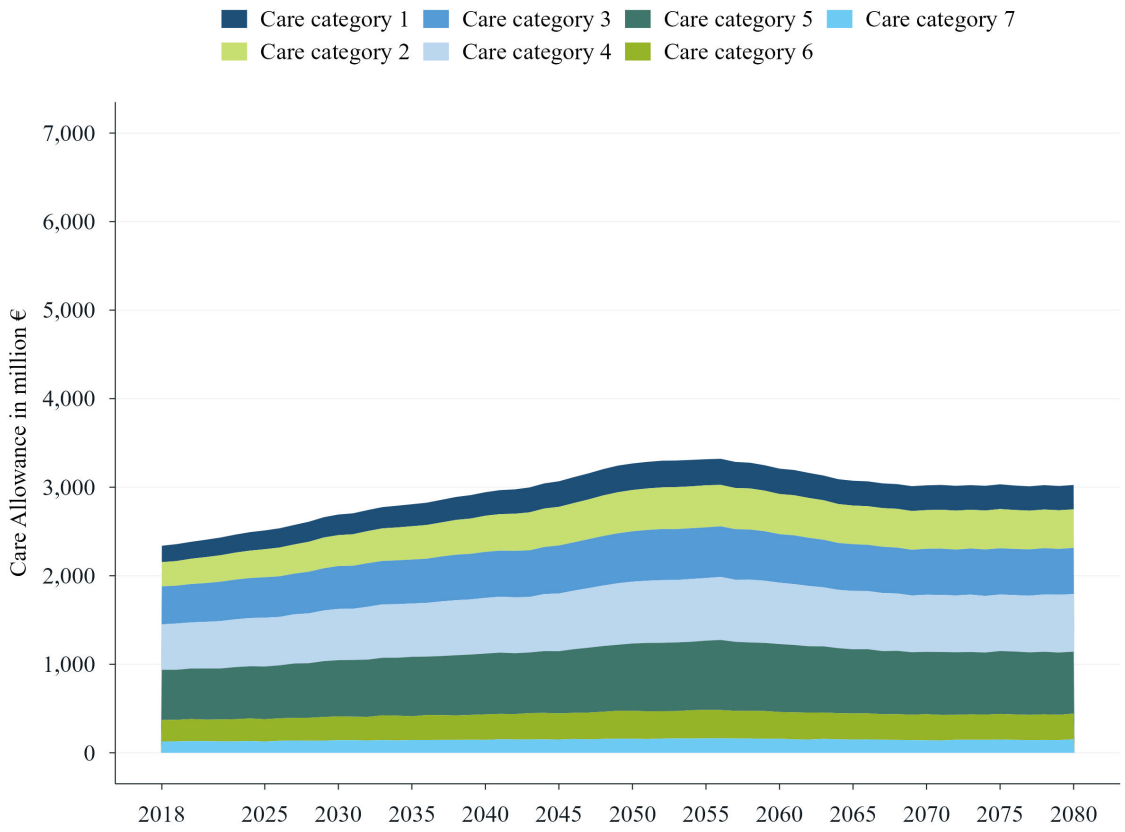
Source: WIFO.

Figure 9: LTCA Prevalence 2080 – Slow aging



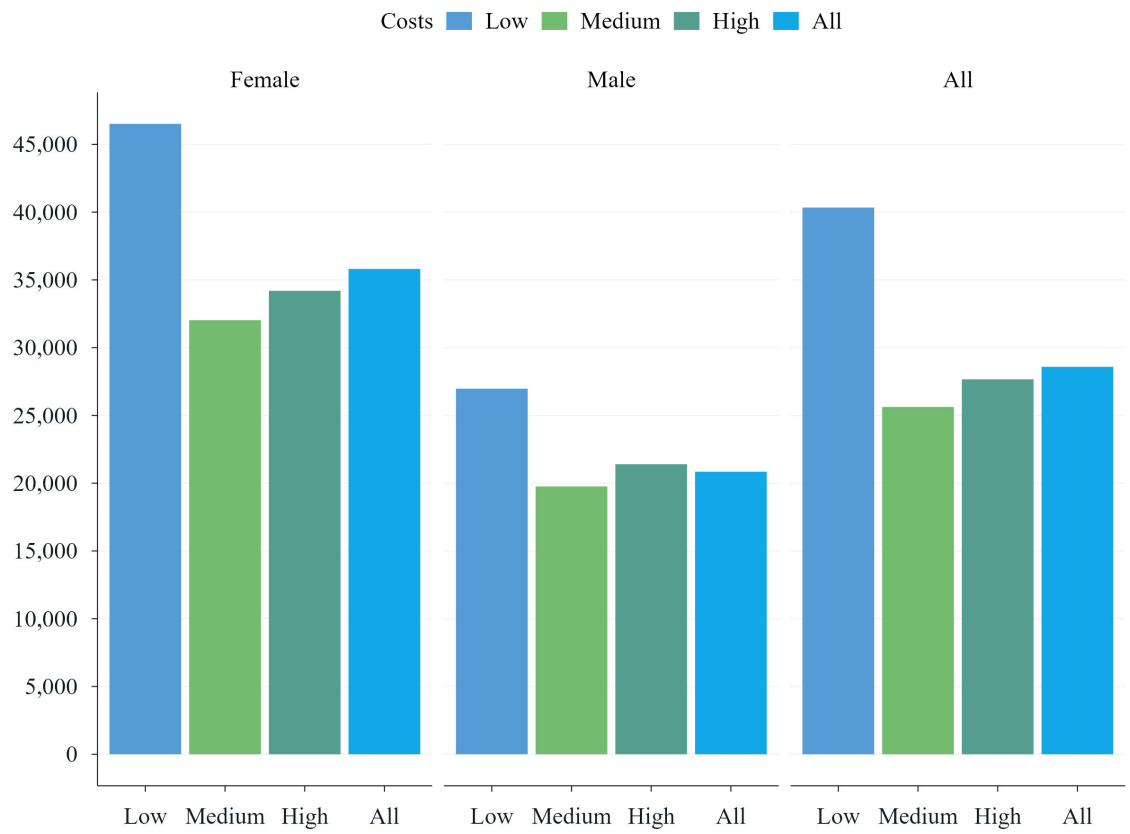
Source: WIFO.

Figure 10: Total LTCA expenditures by category – Constant mortality



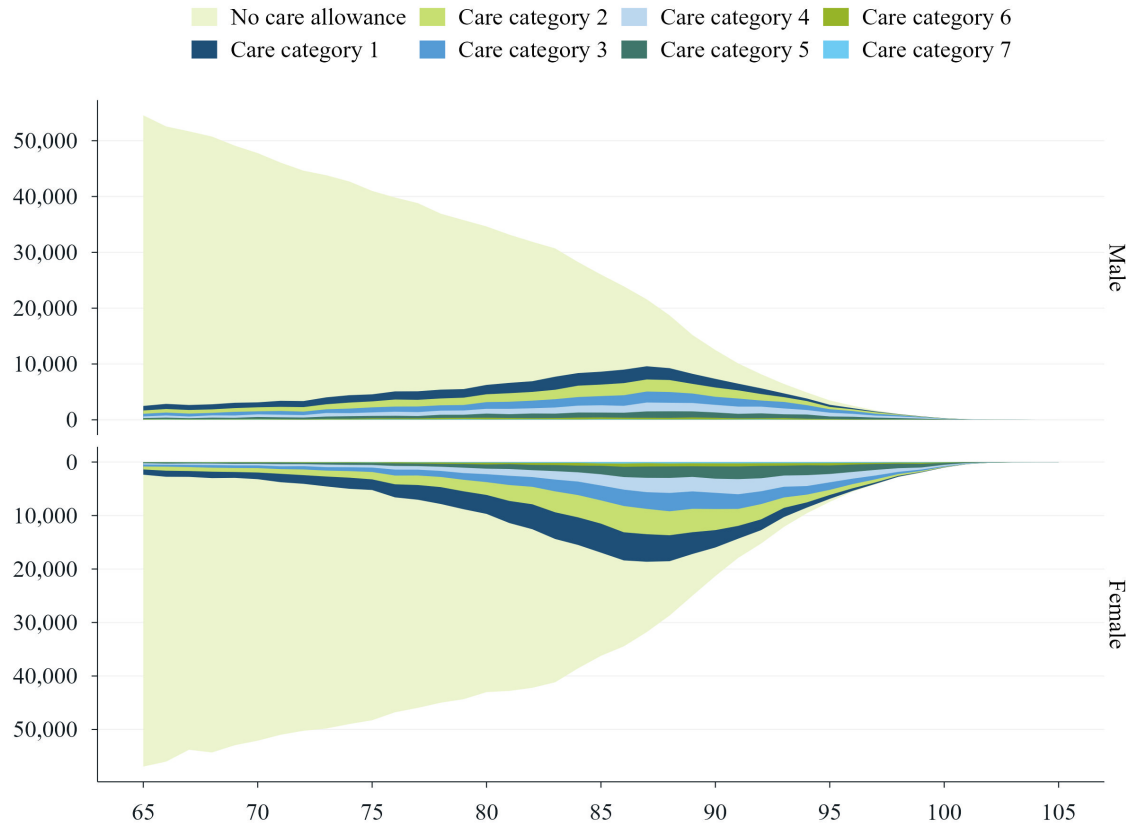
Source: WIFO.

Figure 11: Lifetime costs per person 65+ (now 65) – Constant mortality



Source: WIFO.

Figure 12: LTCA Prevalence 2080 – Constant mortality



Source: WIFO.

5 Conclusions

Demographic projections for Austria, as for many other countries, highlight the trend towards an ageing population. Statistics Austria projects that the share of the population aged 65 years and older will increase from 20% in 2023 to 29% in 2080. Consequently, alongside a decline in labor supply, many demographic-related expenditures will increase. Especially, public expenditure on long-term care (LTC) in Austria is projected to double from 1.6% of GDP in 2022 to 3.1% by 2070 according to macroprojections by the European Commission (European Commission, Directorate-General for Economic and Financial Affairs, 2024).

In this study, we used dynamic microsimulation to estimate the future development of expenditures for the individual allowance for long-term care (LTCA) in Austria. With a total volume of €3.1 billion (or 0,65% of GDP in 2023), the LTCA represents a large expenditure item within the Austrian long-term care system, only slightly less than the public expenditure on long-term care services of €3.2 billion in 2023. Currently, more than one fifth of individuals over 65 and more than half of those over 80 receive this benefit. The significance of the LTCA also lies in its function as a prerequisite for accessing additional services, such as support for 24-hour care and financial assistance for caregiving relatives.

The future development of entitlement to the allowance and the associated expenditures thus carry important implications for the sustainability of the welfare state and for the distribution of social ben-

efits among the Austrian population. To understand the challenges involved and provide a sound basis for policymaking, we require not only accurate projections but also analytical insights that can identify intervention points and support the design of effective policy strategies.

Our projections aim, on the one hand, to show how the number of LTCA recipients in each care level will evolve under the assumption that the population ages in line with official projections and that the current distribution of care needs by age, gender, and educational group remains constant over time. On the other hand, contrasting scenarios are used to examine how changes in individual determinants and the assumptions applied affect the projections.

As expected, the baseline scenario shows a marked increase in total expenditures, with a steeper cost curve until around 2050, followed by a slower increase. Spending rises across all care allowance levels, with a particularly high concentration of costs in levels 4 and 5. Under this scenario, the number of LTCA recipients among older adults aged 65 years and older will increase to more than 850,000 by 2080. Accordingly, the share of the population receiving the benefit will rise from 5.2% in 2023 to 8.4% in 2080. A comparison with a scenario that assumes constant mortality reveals that most of the cost increase in the baseline scenario is attributable to rising life expectancy. Without this increase, the number of recipients would reach just under 527,000 by 2052 and then slightly decline to 483,000 in 2080. Our other scenarios equally highlight the sensitivity of cost projections to different key assumptions, particularly those related to changes in population health and therefore care needs. Neglecting the positive health effects on care needs associated with the educational expansion leads to projected total expenditures that are about 14% higher by the end of the projection period than in the scenario that accounts for the mitigating effect of educational expansion. Assuming that the expected increase in life expectancy will go hand in hand with a delay in the onset of care needs along the life course, conversely, leads to substantially lower costs than in our baseline (which implicitly assumes that longer lives lead also to more years with care needs). According to the corresponding scenario, total expenditures will reach only slightly under €3.4 billion by 2080 and the number of LTCA recipients will increase to 570,000 persons by 2080.

Our analyses demonstrate how results vary when key cost determinants develop differently from what would be expected under a continuation of current trends combined with official population forecasts. Unlike most macroeconomic projections, microsimulation allows for the inclusion of additional health-relevant factors beyond demographics. This added flexibility enables more realistic projections and helps to identify the scope for policy interventions. Limiting analyses to demographic factors alone significantly narrows the policy space. While demographic variables are crucial, they have a quasi-deterministic character.

Dynamic microsimulation is well suited for projecting LTC expenditures where individual-level dynamics (e.g. health transitions, household changes) and policy interactions are critical. Our study benefits from the integration of various data sources and the Austrian care needs assessment system, which we used to model hourly care requirements. Nonetheless, it also has limitations. The use of SHARE data constrains the validation of our results, particularly in terms of measuring care needs across population subgroups. Future research could also adapt our approach to model different scenarios that provide a deeper understanding of the individual determinants of care needs and the potential effects of various policy measures.

Our modeling approach is also well suited to overcome three other shortcomings of macro projections. First, it can be used to avoid the oversimplification that results from ignoring subgroup differences and life events. Second, it can relax static assumptions - e.g. while the EU Ageing Report includes sensitivity tests (e.g. higher life expectancy), it has less flexibility in incorporating policy changes, which limits its ability to assess the impact of LTC reforms. Third, macro models have limited behavioural feedback, i.e. they lack mechanisms to model how individuals adjust their behaviour, potentially underestimating shifts in demand.

Our results highlight several critical policy implications, particularly in addressing demographic shifts and ensuring sustainable care systems. *Educational expansion* is a key lever for reducing future care demand. Health advantages of the higher educated through higher income, better jobs and healthier behaviour accumulate over the life course, resulting in better health outcomes and a lower probability

of requiring intensive care in old age. For policy, this highlights the importance of not only promoting educational attainment, but also addressing the broader social determinants of health-such as occupational health and access to preventive services-that mediate the link between education and care needs. By investing in these upstream factors, policymakers can help to reduce future long-term care demand and improve equity in healthy ageing. We have shown that improvements in health can significantly reduce LTC costs, implying that *healthier ageing initiatives* (e.g., preventive care, chronic disease management) and effective investments in public health could delay care dependency and yield significant long-term savings.

Depending on the scenario, we have shown *significant rises in projected long-term care* (LTC) costs by 2080, particularly between the mid-2040s and mid-2050s, when the baby boom generation of the 1960s will require care. Alongside rising health and pension costs, this period will put enormous strain on public finances, prompting a discussion on *alternative financing models* to balance the generational burden. For instance, a long-term care contribution for pensions above a certain threshold could be proposed for discussion, as literature on long-term distributional issues shows that older people have been less affected by recent crises (Rocha-Akis et al., 2023)(Wiemers et al., 2024).

Further, the paper notes Austria's reliance on informal care and implicitly projected *staff shortages* (see also (Famira-Mühlberger, 2023)). Policies that enhance training programmes for professional caregivers, improved working conditions to retain staff and support for informal caregivers through financial incentives and respite care will be crucial although the latter has to be balanced with policies that increase labour market participation of women.

The paper also reveals a significant *difference in lifetime LTCA costs* between individuals aged 65+ with low and high levels of education. Lifetime costs are substantially higher for those with low levels of education when accounting for education and improvements in health. This calls for investments in the health and education of disadvantaged groups from an early age.

With around 40% of LTCA funds not directly linked to formal services, it might be worthwhile considering tiered *benefit structures tied to service utilisation*, with the aim of improving care quality outcomes. Incentives to combine LTCA with professional care could improve the overall quality of care.

These implications highlight the importance of adopting a *multidimensional approach* that combines demographic adaptation, health system strengthening and equity-focused interventions in order to maintain Austria's universal LTCA system in the context of an ageing population.

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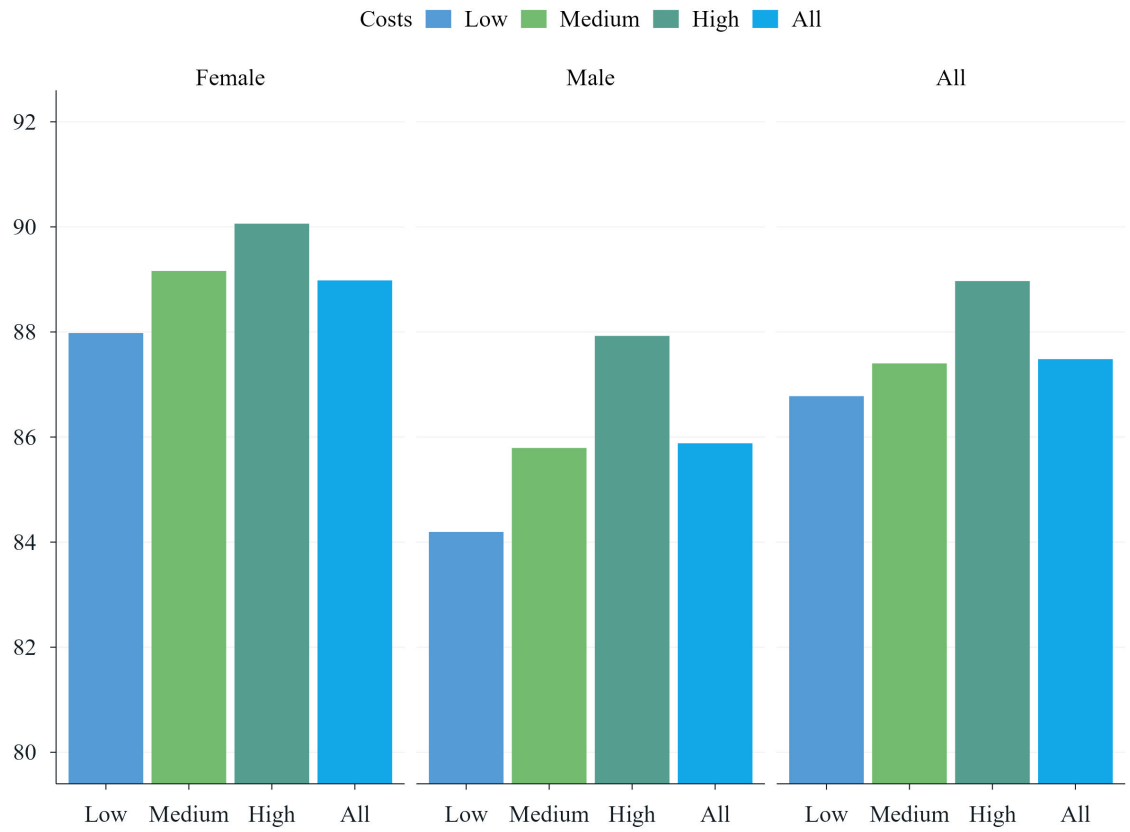
A Appendix

A.1 Life expectancy by education and sex

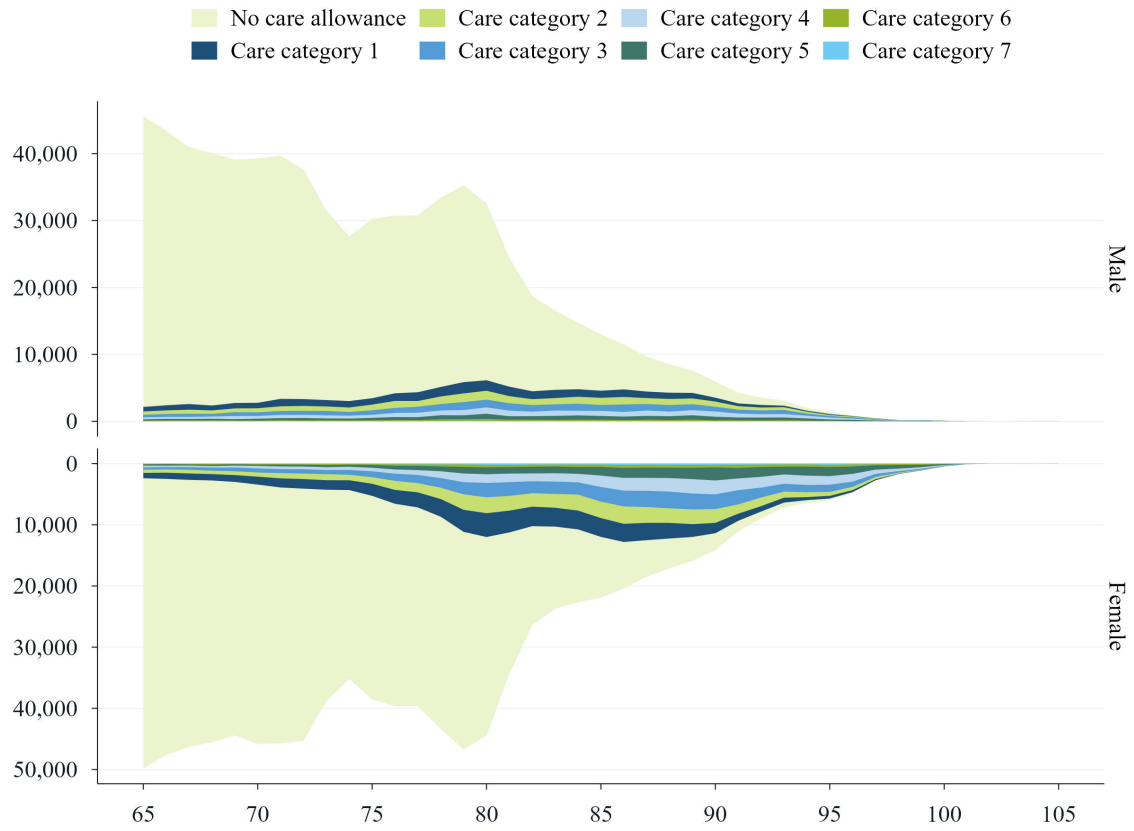
Figure A.1: Lifetime expectancy at 65 (now 65)



Source: WIFO.

A.2 LTCA Prevalence 2020

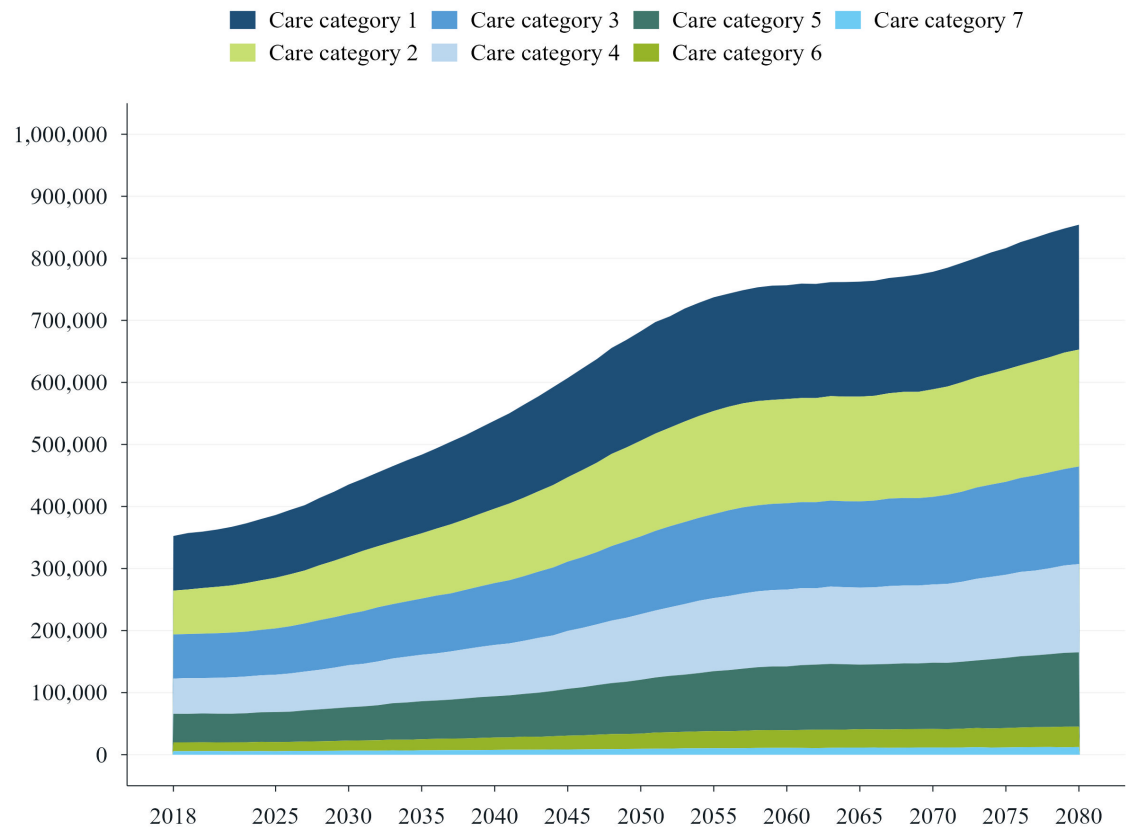
Figure A.2: LTCA Prevalence 2020 (Base)



Source: WIFO.

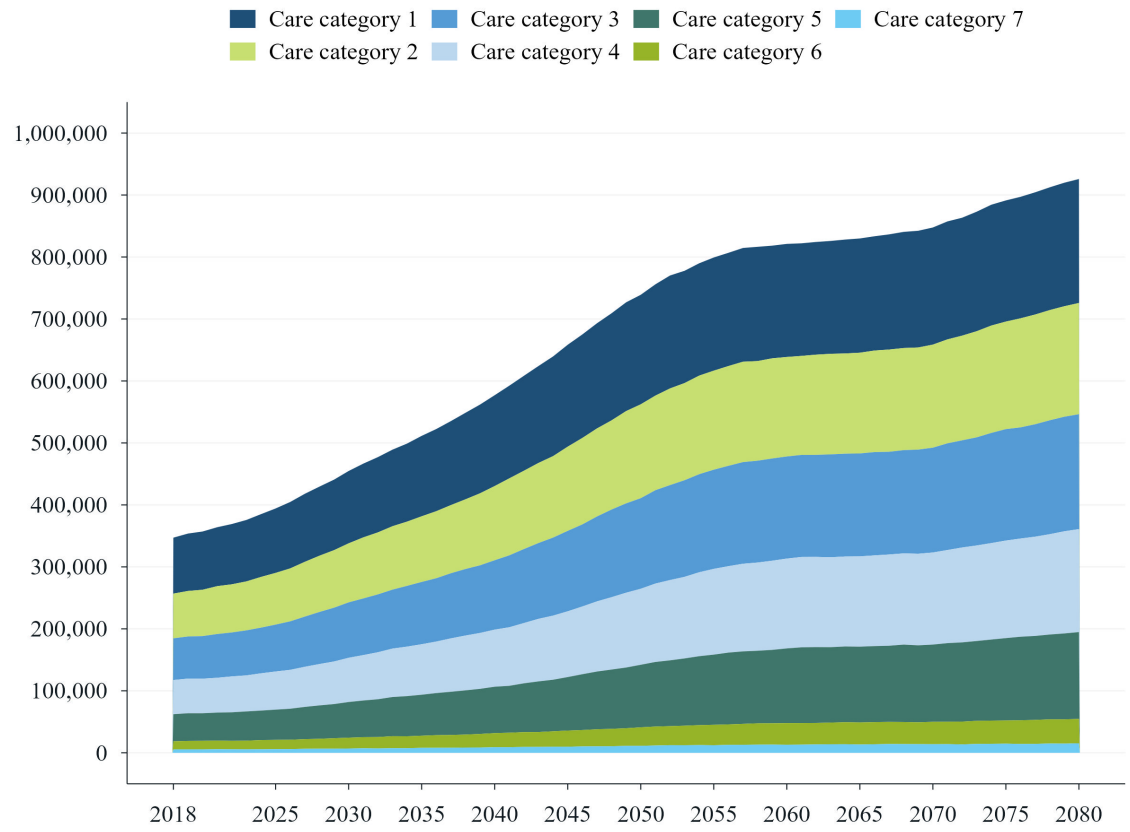
A.3 Cases

Figure A.3: Cases by category – Base



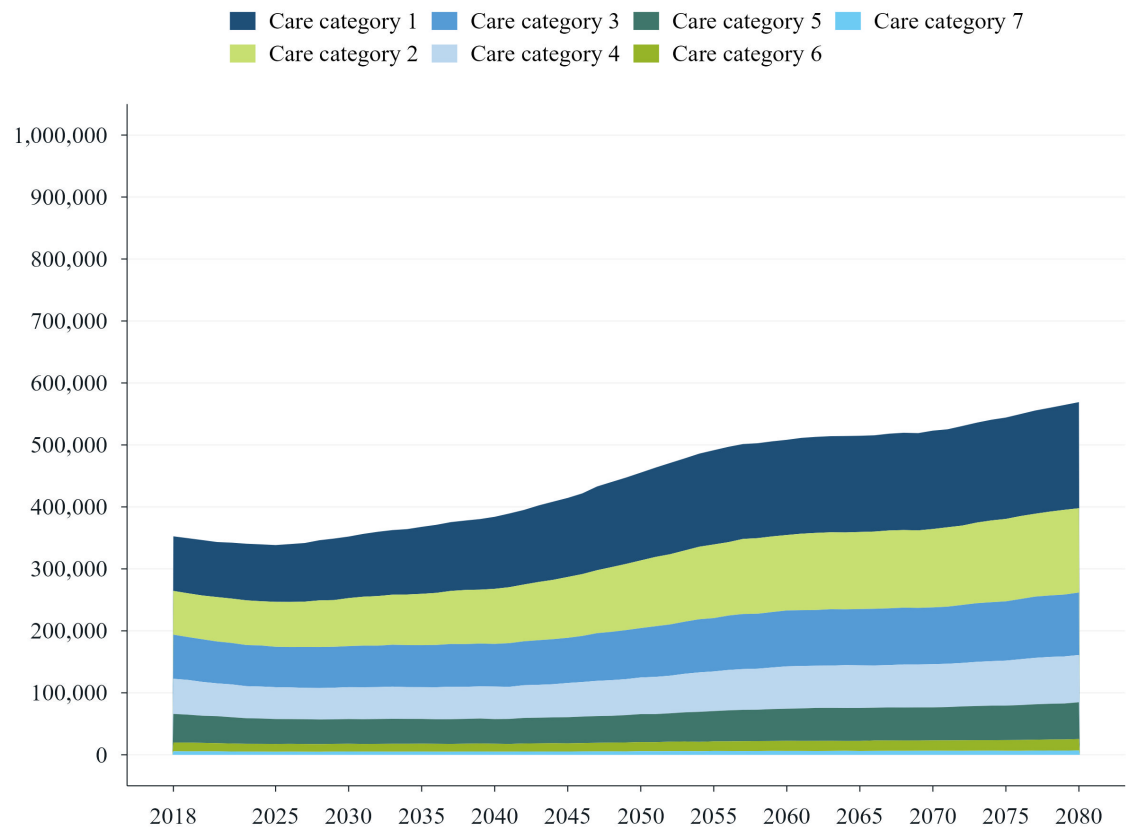
Source: WIFO.

Figure A.4: Cases by category – No education expansion



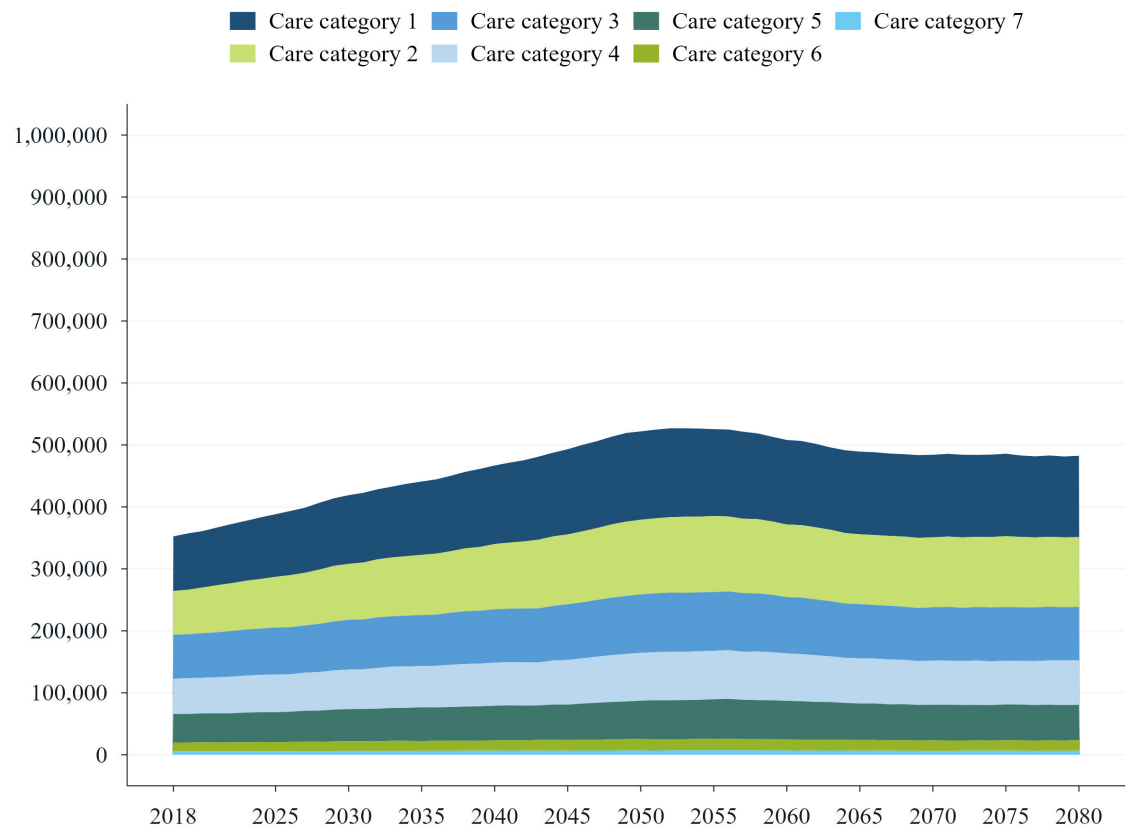
Source: WIFO.

Figure A.5: Cases by category – Slow aging



Source: WIFO.

Figure A.6: Cases by category – Constant mortality



Source: WIFO.

A.4 Parameters

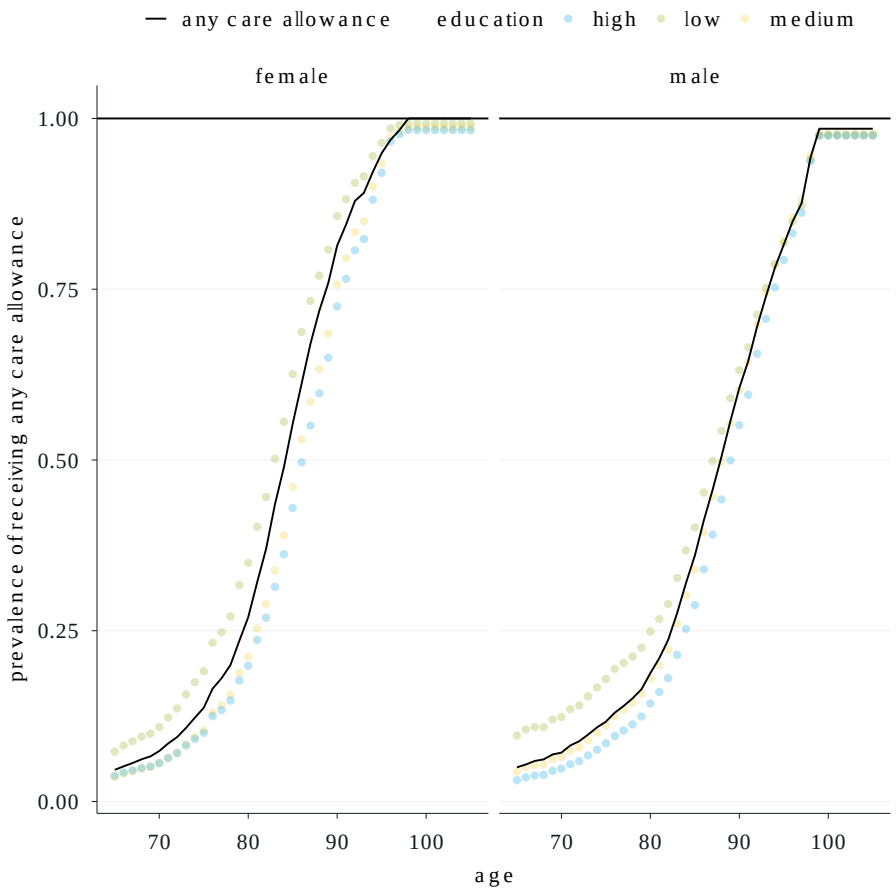


Figure A.7: Prevalence of receiving any care allowance by age, sex and education. The black line provides a comparison with Austrian care allowance statistics for 2021.

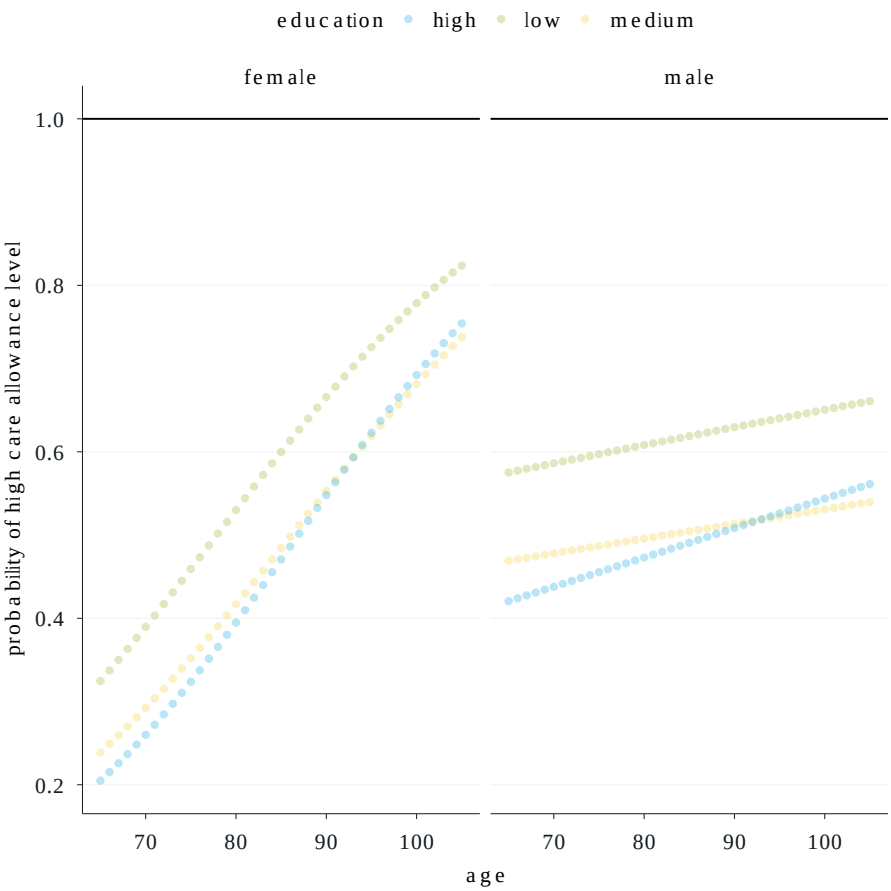


Figure A.8: Predicted probability of falling into a high care allowance level (assessed hours larger than 120 hours) by age, sex and education. Subsample: respondents with 65+ hours of care need.

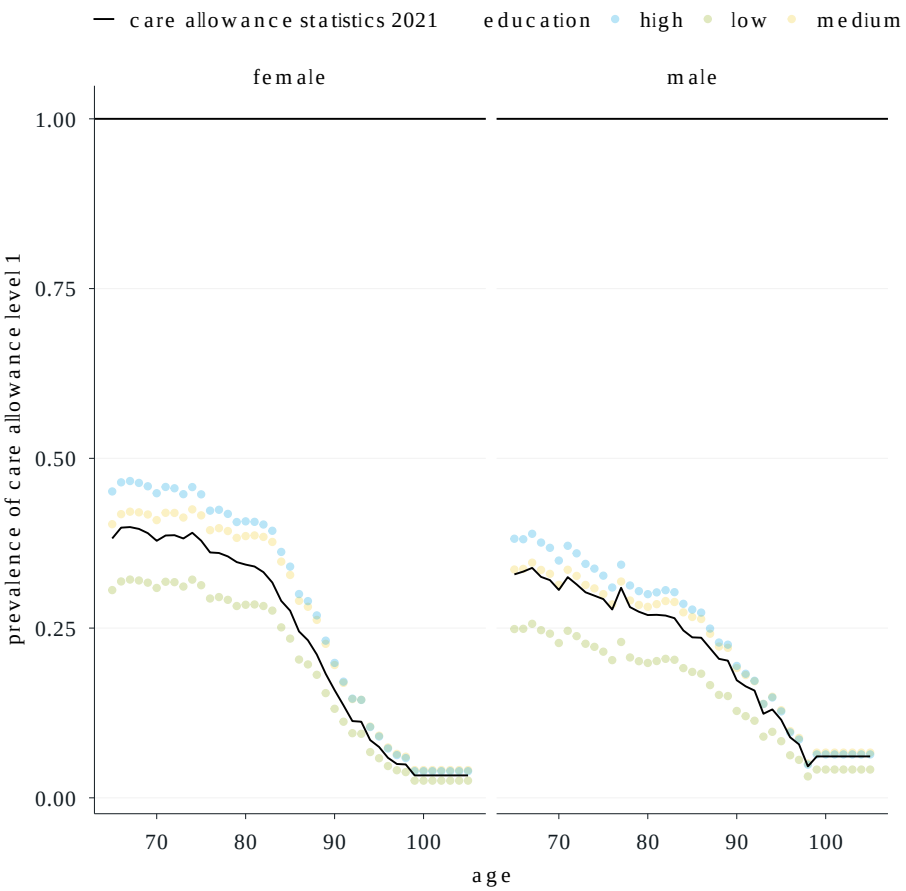


Figure A.9: Prevalence of care allowance level 1 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.

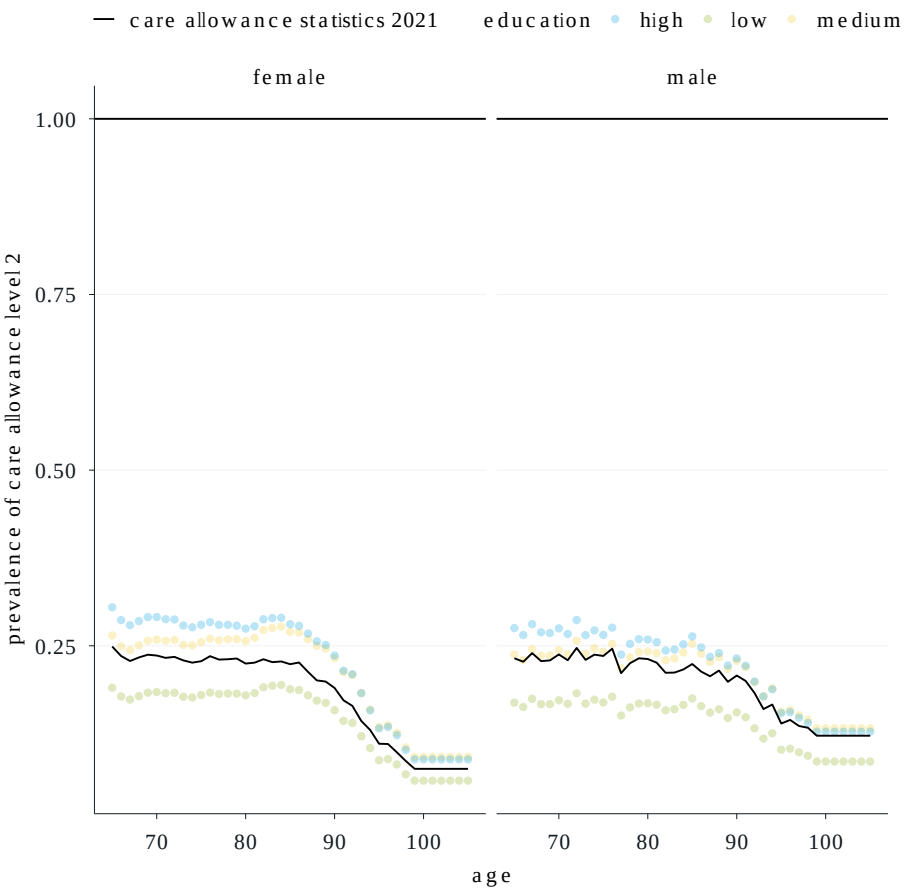


Figure A.10: Prevalence of care allowance level 2 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.

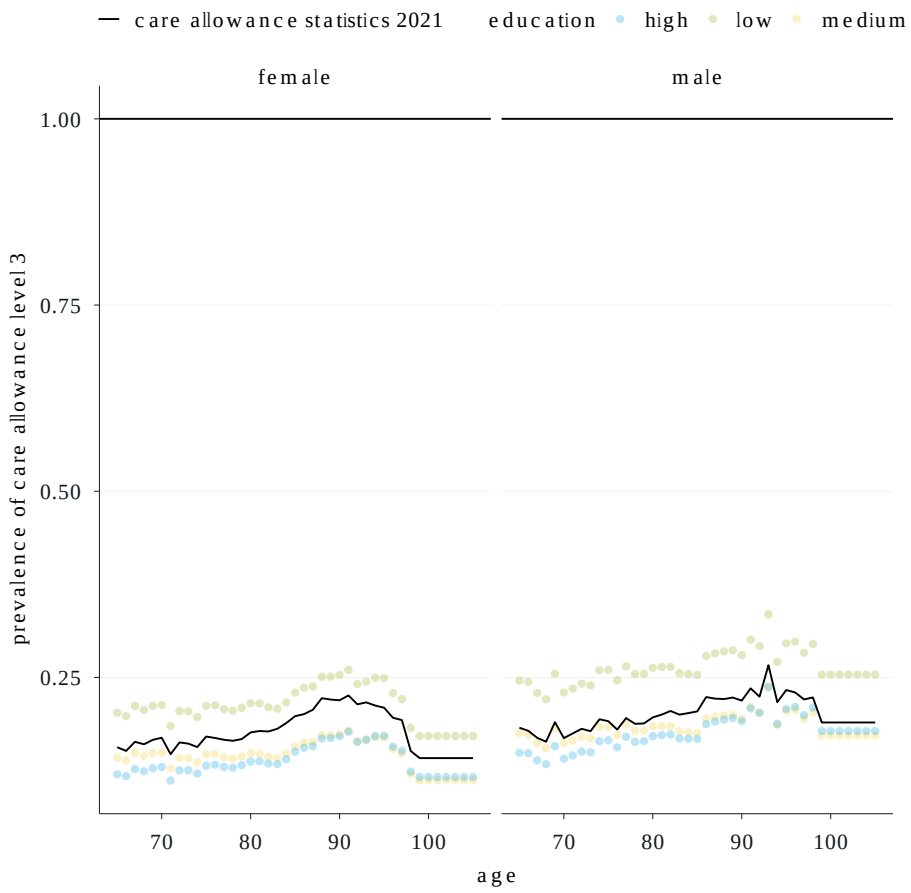


Figure A.11: Prevalence of care allowance level 3 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.

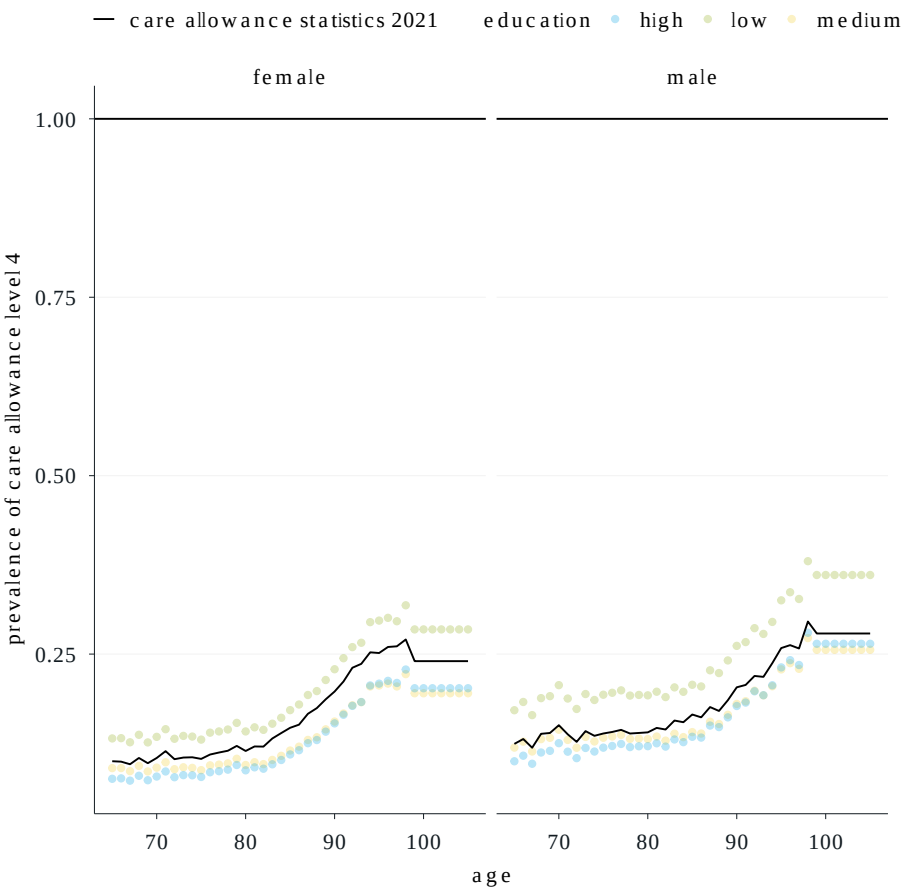


Figure A.12: Prevalence of care allowance level 4 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.

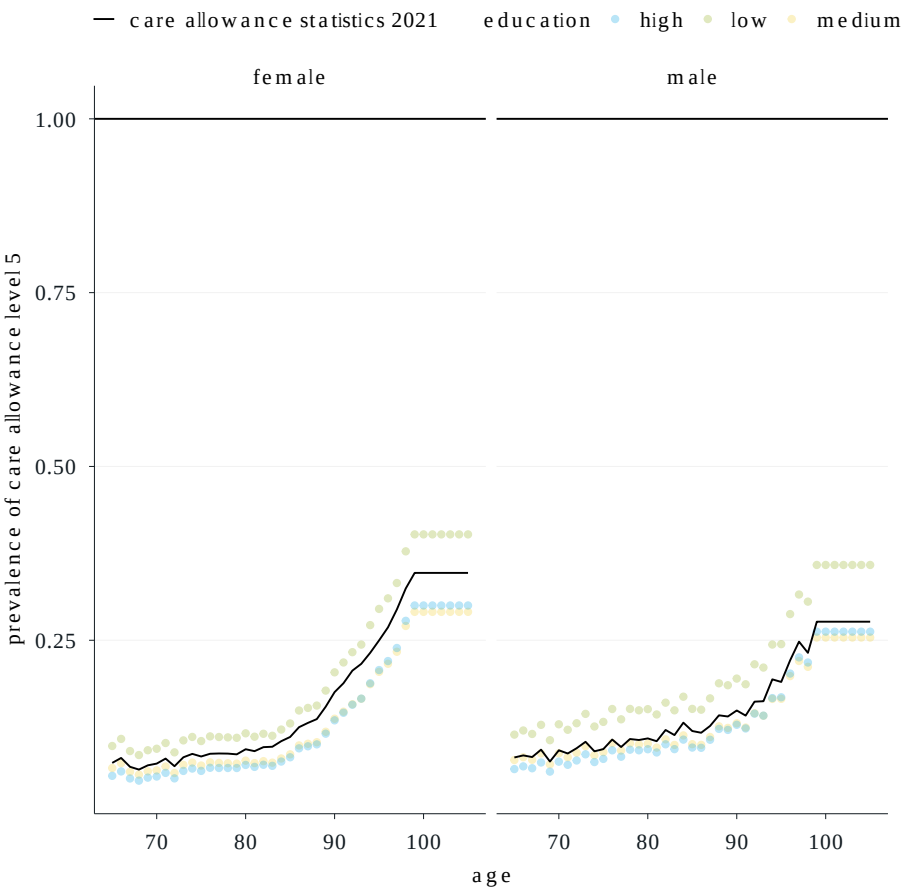


Figure A.13: Prevalence of care allowance level 5 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.

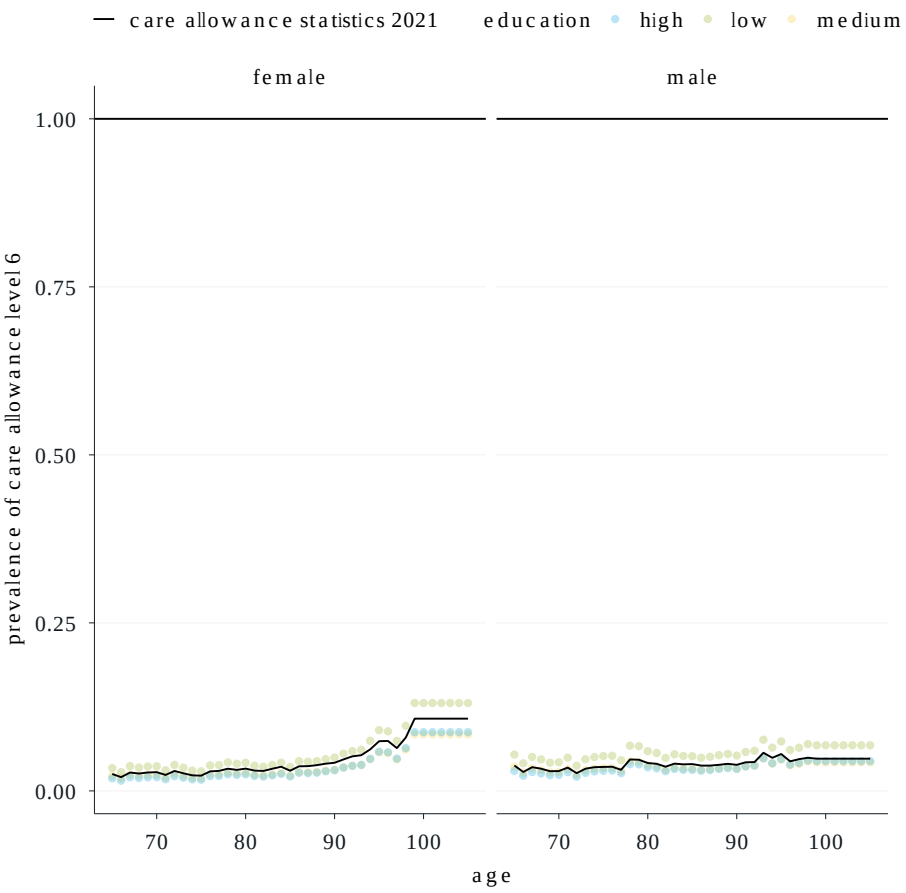


Figure A.14: Prevalence of care allowance level 6 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.

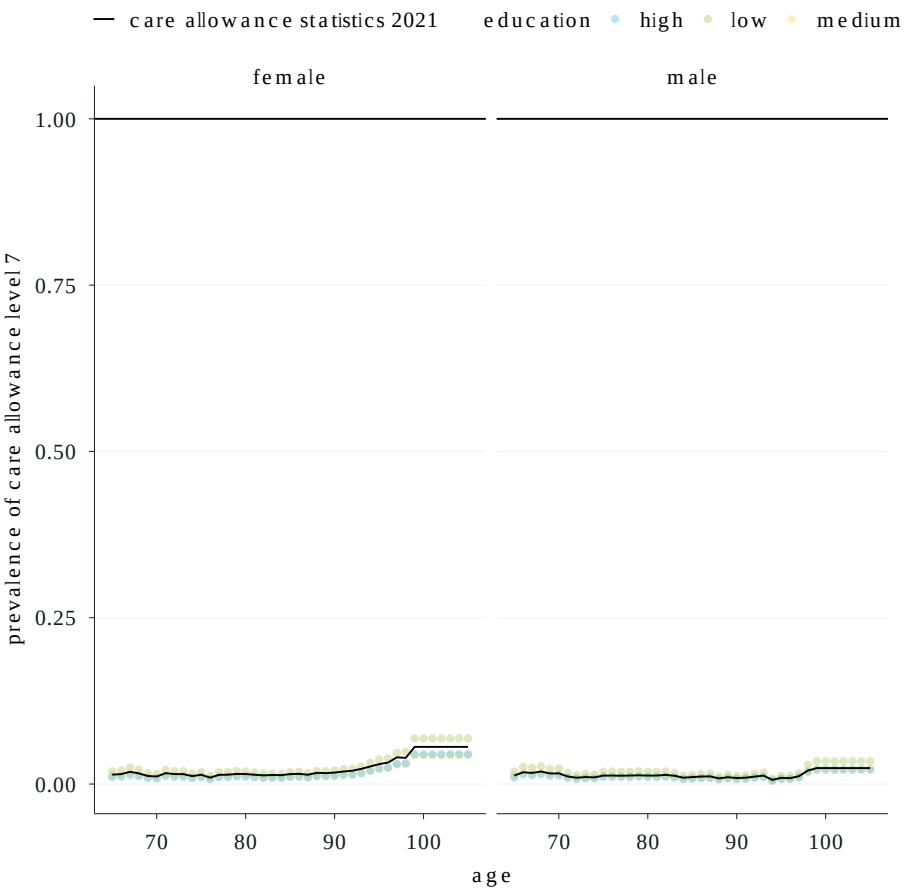


Figure A.15: Prevalence of care allowance level 7 by age, sex and education. Subsample: respondents with 65+ hours of care need. The black line provides a comparison with Austrian care allowance statistics for 2021.