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Abstract

As populations age, the sustainability of long-term care systems increasingly depends on the availability of informal care, particularly from partners. This paper addresses the question of how much care we may expect partners to provide in the future by projecting demand for long-term care (LTC), the care supply mix based on current patterns, and the resulting care gaps up to 2070. Using a comparative dynamic microsimulation model, we contrast the results for Austria and Italy, two countries at very different stages in the ageing process and with pronounced institutional differences. Our results suggest that delayed widowhood due to improvements in mortality is a mitigating factor for the increased need for formal care in ageing societies, although it can only offset this increase to a limited extent. Even under optimistic assumptions, potential care gaps substantially increase in both countries, primarily due to demographic change. The size of these gaps is influenced by institutional settings, partnership patterns and gains in longevity, but no scenario reverses the overall upward trend. These findings emphasize the need for comprehensive LTC reforms that extend beyond merely promoting informal care and highlight the necessity for substantial investment in formal care infrastructure.

Keywords: population ageing, long-term care, spousal caregiving, care gap, projections, dynamic microsimulation
JEL codes: C53, I11, J14

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1 Introduction

Population ageing will increase the number of people in need of care, as the risk of physical and cognitive impairments rises with age. Various analyses on the costs of providing care reflect this. For example, the Ageing Report of the European Commission (2024) projects an increase in long-term care (LTC) expenditure in the EU from 1.7% of GDP in 2022 to 1.9% in 2030 and 2.6% in 2070. Thus, ageing societies are being forced to develop strategies to increase the supply of care while limiting the impact on public finances. To meet this challenge, many countries are implementing policies that encourage the provision of informal care. These policies are based on the expectation that non-professional caregivers, primarily spouses[1], children and other relatives of the care-dependent individuals, will absorb a substantial share of the additional demand for care (Costa-Font & Vilaplana-Prieto, 2025; Elayan et al., 2024; Maarse & Jeurissen, 2016; Verbakel, 2018).

Informal care arrangements have many benefits, but they are also associated with well-documented risks. These risks include potential negative effects on the well-being and labour force participation of the caregivers (Bauer & Sousa-Poza, 2015; Rocard & Llena-Nozal, 2022). Additionally, the strategies to expand informal care are based on the implicit assumption that the pool of informal caregivers will be large enough in the future to relieve the burden on care systems and public finances. However, this assumption must be examined in the light of demographic and social changes that will affect the number of available informal caregivers. We investigate how such trends may affect people's ability to receive care from their spouse or partner living in the same household. Along with children, partners provide most of the informal care and often act as primary caregivers, supplying the largest share of informal care hours for coupled individuals (Barczyk & Kredler, 2019; Bertogg & Strauss, 2020). If the partner is unable to provide care, e.g. because they themselves have functional limitations or are in paid employment, the risk of unmet care needs increases considerably (J. Zhang et al., 2025).

As life expectancy increases and the number of older adults in need of care grows, so does the number of individuals who could potentially support their partners in need of care. However, several factors will constrain the number of people able to provide informal care within the household. These factors include increased labour market participation, particularly among women, as well as higher retirement ages. In addition, there are higher shares of single-person households due to changing living arrangements and partnership patterns (Wieczorek et al., 2022). Further, the extent to which spouses can provide care depends on their own health and morbidity.

Taken together, these social and demographic trends may reduce the number of caregiving partners and/or the hours of informal care provided. This would add further pressure to already strained care systems. However, whether and to what extent this negative scenario will materialise is an empirical question, and the answer will also vary by country depending on demographic, social and institutional characteristics. In this paper, we examine the future contribution of partners to care provision, assessing the impact of different social and demographic trends and the underlying assumptions. Using dynamic microsimulation, we project the demand for care, the components of care supply, and the resulting care gaps. Taking a comparative perspective, we provide projections until 2070 for Italy and Austria. These two European countries face similar LTC challenges, but differ in their institutional settings and are at different stages of the demographic ageing process. Our aim is to quantify the net effect of countervailing trends on the supply of informal care by spouses, to isolate the contribution of different drivers of care supply, and to highlight the sensitivity of projected care gaps to different assumptions.

Although several scholars have pointed out the links between demographic and social changes and the potential for providing informal care (Broese Van Groenou & De Boer, 2016; Maarse & Jeurissen, 2016;

[1] Throughout the paper, we use the terms spouse and partner interchangeably. We define being in a partnership by whether the partner lives in the same household and do not consider marital status.

Stone, 2015), there is a lack of studies gauging how the supply of informal care will develop in the future. A sound understanding of the magnitudes involved and the role of different mechanisms is key to critically assessing existing reform strategies and identifying policy needs.

Existing studies are limited to a few countries, focus primarily on care demand, and mostly rely on cell-based or macro-modelling approaches. For instance, Pickard et al. (2007, 2012) project the supply of care that disabled older adults in England receive from their spouses and children. These studies highlight the strong reliance of this group on their adult children for care, while also acknowledging that this is partially because disabled older adults are less likely to have a spouse than other people in this age group. In a more recent study of Korea, Hu et al. (2022) use a macro-simulation model to project informal care demand between 2020 and 2067. According to these projections, the demand for informal care from adult children or relatives is expected to increase much faster than the increase in demand for spousal care. In a microsimulation study of China, L. Zhang et al. (2024) project the informal care needs of older adults in rural and urban areas until 2040. Their results indicate that the demand for spousal care will increase most for men living in urban areas. However, they do not provide estimates of whether the number of spouses able to provide care will rise accordingly. Ribeiro et al. (2021) investigate changes in the ratio of potential caregivers to the number of persons aged 80 years and older in a sample of European countries. Rather than making projections, however, they extrapolate the ratio of potential caregivers aged 45–64 available for each person aged 80 and older, using census data and data from the UN database of population projections.

The present study makes several contributions to the existing literature. First, we provide quantitative evidence on the potential effects of demographic changes and evolving partnership patterns on the demand and supply of informal LTC. Our approach is general and capable of accounting for the intensity of LTC needs and the mix of formal and informal care supply within a unified framework. Although our focus is on spousal caregiving, we also consider different components of formal care, as well as informal care provided by children and individuals living outside the household. Using what-if scenarios, we disentangle the effects of different drivers on the amount of informal care that can be expected. These scenarios highlight the role of changes in longevity and partnerships while accounting for other demographic factors and institutional setups that determine the care supply mix. We present detailed findings for two countries, Italy and Austria, for which, to our knowledge, no evidence on the future development of informal LTC supply is currently available. The comparison allows us to contrast the effects of different trends and determine how sensitive the results are to changes in the determinants of informal care. These results can also provide more general insights and helpful benchmarks for researchers and policymakers in other countries.

Our results suggest that we can expect an increase in the number of hours of informal care provided by spouses or partners in the coming decades. Depending on whether longer life expectancies are also accompanied by longer partnerships and on the extent to which spouses fill emerging care gaps, spousal care provision in Austria may increase between 35% and approximately 130%. In Italy, where the demographic ageing process is more advanced, the increase will be much more modest, growing by 50% in the most expansive scenario. However, in both countries, additional informal care by partners can only marginally contribute to mitigating the widening care gaps expected under the current demographic projections and status quo assumptions about the evolution of LTC supply. Our projections also shed light on the interplay between demographic developments and institutional LTC settings. Care needs increase much less in Italy than in Austria because the two countries are at different stages of the demographic ageing process. Nevertheless, Italy's heavier reliance on informal care results in care gap increases similar to Austria's.

The remainder of this paper is structured as follows: Section 2 provides the context for our research. First, we review the theoretical and empirical literature on informal LTC to identify the different determinants of informal care. Then, we explain how these determinants are covered in our projections and define our research questions. Next, we describe the salient features of LTC systems in Italy and Austria, highlighting common trends and key differences in their demographics and informal care patterns. Sections 3

outlines the projection methods and data sources employed in our analysis. This section also describes the assumptions underlying our baseline projection and the different scenarios we employ. Section 4 presents the results of the study, Section 5 provides a discussion of the findings, and Section 6 offers conclusions.

2 Background and research questions

2.1 Determinants of informal care provision

On average, around 60% of older people receiving care in OECD countries state that they receive care only from informal caregivers (Spasova et al., 2018). Although informal care plays a key role in all LTC systems, there are significant differences between countries. Notably, a well-documented North–South gradient in the utilization of informal care exists across Europe. Southern Europe relies heavily on family care, while Nordic countries have higher levels of formal home care and residential care (Barczyk & Kredler, 2019; Haberkern & Szydlik, 2010).

These large international differences point to the importance of national care systems, socio-cultural norms as well as other factors that explain informal care. According to the model for informal care proposed by Broese Van Groenou and De Boer (2016), the intention to provide informal care at the individual level depends on dispositional factors, including general and normative beliefs, as well as perceived constraints. However, the extent to which this intention results in the actual care provision is strongly influenced by contextual factors, including the presence of other helpers as well as structural and normative aspects at the familial, social network and community levels. Furthermore, numerous other studies demonstrate that macro-level factors, the main focus of this study, can affect the demand for and supply of informal care (Agree & Glaser, 2009; Bertogg & Strauss, 2020; Quashie et al., 2022).

One important set of macro-level drivers is demographic change. Increased life expectancy leads to an increased demand for care. At the same time, lower fertility rates and increasing dependency ratios reduce the number of younger people available to provide care. Conversely, the increased longevity of spouses and close relatives can result in a greater number of people of the same age who can potentially provide informal care (Agree & Glaser, 2009). The extent to which changes in longevity will impact the demand and potential supply of care depends on population health and on the number of healthy life years (i.e., the compression or expansion of morbidity). However, the availability of informal caregivers will also depend on competing demands resulting from changes in labour force participation and working careers. Higher labour force participation of women and higher retirement ages for both men and women will reduce available time while raising the opportunity costs for providing care.

The availability of informal care within households may also change due to shifts in partnership patterns, especially as the number of older adults living alone increases. Globally, there is a clear trend of declining household size. Between 1970 and 2020, household size decreased by an average of 0.5 persons per decade across 156 countries (Esteve et al., 2024). According to Eurostat data from 2023, the number of adults aged 54 and over living alone has increased by over 23% compared to 2013.

Another group of factors determining the demand for and the supply of informal care relates to various dimensions of welfare state policy. In an effort to contain the increase in ageing-related public expenditures, many governments are implementing measures to support the provision of informal care (Verbakel, 2018; Wieczorek et al., 2022). In particular, there is an increasing commitment to supporting informal caregivers who balance paid employment with caregiving responsibilities. Half of the OECD countries, including Austria, grant paid leave to people who provide care to older adults (Rocard & Llena-Nozal, 2022). These efforts are based on the assumption that informal care arrangements can relieve some of the pressure on formal care systems.

For some time now, researchers have examined the relationship between the provision of informal and formal care provision. Studies support the hypothesis that formal care services substitute for family and intergenerational care and, thus, that we can expect a certain 'crowding out' of informal care in contexts where more formal care is offered (Haberkern & Szydlik, 2010). However, the literature also highlights that formal and informal care are only imperfect substitutes. Informal arrangements effectively substitute for long-term care when the needs of older adults are minimal (Firgo et al., 2020). Thus, the relationship between formal and informal care depends on the specific type of care needs examined (Bonsang, 2009; Bremer et al., 2017).

Table 1 provides an overview of the main drivers of change and their effects on the demand and supply of spousal caregiving. Our microsimulation model highlights the effects of different drivers and quantifies the total changes in care needs, care provision, and the resulting care gap. Our approach covers the highlighted factors. Using what-if scenarios, we can investigate the implications of different trends and assumptions, focusing on changes in the demographic structure of the population and in the partnership status of older adults.

Table 1 Drivers of change affecting the demand for and supply of partner care within the household

An increase in ... leads to more/less	**... demand**	**... supply**
Longevity	↑	↑
Fertility	↓	
Single households		↓
Formal care	↓	⟷
Morbidity	↑	↓
Support for informal care		↑
Labour force participation		↓

Note: Drivers in **bold** are covered by this study.

More specifically, we address the following three research questions: First, will older adults receive more or less informal care from their partners in the future, and what impact will this have on care gaps? Second, what is the magnitude of the effects associated with the aforementioned drivers, and how do changes in the underlying assumptions affect these projections? Third, what can we learn from a comparison of Italy and Austria about the role of spousal caregiving in the future supply of care and the vulnerability of LTC systems facing similar challenges but characterized by different demographic, social and institutional fundamentals?

2.2 Long-term care in Austria and Italy and demographic differences

Both Austria and Italy have developed unique approaches to long-term care that reflect their respective welfare traditions and demographic challenges. Although both countries' systems include universal cash benefits, their organizational structures, benefit design, and integration with formal care services differ significantly. In both countries, cash benefits account for approximately half of all long-term care expenditures (Bundesministerium für Soziales, Gesundheit, Pflege und Konsumentenschutz (BMSGPK) (Hg.), 2024; Gubert & Perobelli, 2024).

In Austria, individuals requiring long-term care receive support from the public sector through two primary mechanisms: cash benefits and in-kind benefits. Cash benefits are provided through the long-term care allowance (LTCA, or *"Pflegegeld"*), which is financed through general taxation (0.65% of GDP in 2023) and paid by the federal government. In-kind benefits include nursing homes, residential care facilities, and home care services, which are organized by regional governments (Famira-Mühlberger & Österle, 2024).

The Austrian LTCA is a needs-based benefit that is not subject to means testing. The LTCA is structured across seven levels based on the intensity of care required. Monthly payments range from €200.80 at level 1 to €2,156.60 at level 7, with annual inflation adjustments. As of 2023, approximately 5.2% of Austria's population receives the LTCA, rising to 22% among those aged 65 and older. In 2022, the public sector spent 1.26% of GDP on long-term care (LTC) allowances and services.

Despite Austria's well-developed formal care infrastructure, informal care continues to play a significant role in its long-term care system. Barczyk and Kredler (2019) argue that there is a north-south gradient of informal care across Europe. Italy is an example of a southern country with a high share of informal care, while Austria represents "middle" countries with medium levels of informal care. This contrasts with countries in northern Europe, which exhibit low shares of informal care. Specifically, the authors calculated that in Italy 62% of disabled older adults receive only informal care, whereas in Austria, the figure is only 36%. Conversely, approximately 15% of this group receives care in nursing homes in Austria, compared to only 7% in Italy.

Italy's long-term care (LTC) system emphasizes family caregivers and has a more fragmented governance structure involving national, regional, and local authorities. The main intervention in Italy is the Companion Allowance ("Indennità di Accompagnamento"), a universal cash benefit for individuals with severe disabilities that is not linked to formal care services (0.7% of GDP in 2022).[2] Similar to Austria, this cash benefit has no restriction of use and is intended for individuals with severe disabilities, regardless of age or income. Unlike the Austrian LTCA, the Italian Companion Allowance is a fixed monthly amount (€542.02 in 2025) regardless of dependency level. Approximately 3.7% of Italy's population receives the allowance, rising to around 11.5% among those aged 65 and older. This means a smaller proportion of the population receives the allowance compared to Austria. In 2023, public expenditure on long-term care (LTC) in Italy was estimated at 1.63% of gross domestic product (GDP) (Gubert & Perobelli, 2024). In both countries, we observe cost-sharing conditions for LTC services that mostly depend on income levels. However, unlike in Austria, co-payments for stays in nursing homes vary significantly across Italian regions.[3]

Both Gubert and Perobelli (2024) and Brugiavini et al. (2023) characterize the Italian LTC system as highly fragmented due to a weak coordination between the central and local governments. This results in a heterogeneous system with significant differences between regions and municipalities; northern regions typically offer more comprehensive in-kind services than southern regions.

Both countries face similar challenges, such as labour supply restrictions and the need for structural reforms to address demographic changes. Austria has made progress in integrating community-based care and supporting informal caregivers. Italy, on the other hand, has recently introduced reforms aimed at improving coordination and expanding service provision; however, the impact has been limited thus far (Famira-Mühlberger & Österle, 2024; Gubert & Perobelli, 2024).

The two countries' different demographic profiles and stages of ageing make them valuable case studies

[2] Recently, the Italian government launched a pilot program for 2025-2026 that provides financial support to address severe care needs among individuals aged 80 and older with limited income. Eligible individuals receive an additional benefit exclusively for hiring professional caregivers or home care services (*"Prestazione Universale" or "Bonus Anziani")*.

[3] In Austria, when the LTCA and pension do not cover the costs, a state subsidy is provided without further means-testing. This essentially means that the federal state covers the remaining costs.

for examining LTC systems. Italy currently has the oldest population in the European Union (EU), with a median age of 47.1 years in 2020 (Eurostat, 2025a). It also has one of the lowest total fertility rates in the EU (1.24 in 2020) and faces acute challenges in meeting the growing demand for LTC services (Eurostat, 2025b). Conversely, Austria's median population age is slightly below the EU average (43.4 years in 2020 as compared to 43.9 for the entire union) and its fertility rate (1.44) is close to the EU average (1.51).

Consequently, the old-age dependency ratio (the percentage of the population aged 65 and older compared to the population aged 20-64) differs significantly between Italy and Austria. In 2022, it stood at 40.8 in Italy and only 32.0 in Austria. It is projected to rise to 65.5 in Italy and 57.0 in Austria by 2070 (European Commission, 2024). In Italy, the need for care due to population ageing will peak around 2055 and then decline; this point will not be reached within the timeframe of our projections (2070) in Austria.

3 Method

This section briefly describes the method employed in this paper to study the effects of increased longevity on the availability of spousal care and the future care mix. We apply the microsimulation model microWELT 2.0 LTC recently developed by Warum et al. (2025), which offers a quantitative framework for the comparative analysis and projections of the LTC sector in Austria and Italy, i.e. the micro-level demand and supply of LTC care, and implement scenarios on the future development of partnerships of older adults.

3.1 Data

We use various microdata sources to parameterize the microsimulation model microWELT. Consistent with a cross-country perspective, we employ comparative European datasets to construct the initial model population and estimate parameters for individual probabilities and transitions in each country under study. Starting populations are obtained from the European Union Statistics on Income and Living Conditions (EU-SILC) by pooling cross-sectional waves from 2014 to 2018 and are weighted to reflect the population in the base year (2018). Additionally, we use EU-SILC microdata to estimate individual probabilities and state transitions characterizing the core socio-demographic processes of fertility, mortality, migration, education and partnership (see Warum et al. (2025) for further details).

The LTC module is parameterized drawing on data from the Survey of Health, Ageing and Retirement in Europe (SHARE) and a method recently developed by Warum et al. (2025) for the comparative measurement of care needs, the care supply mix and care gaps in hours. SHARE is a harmonized panel survey that provides representative data on the population over 50 in many EU countries, including Austria and Italy. SHARE is a unique, comparative source that provides information on the demand and supply of long-term care services. It enables us to distinguish the major elements of any care mix, i.e. nursing homes (institutional LTC) and formal and informal home care.

We use a pooled cross-section of SHARE waves 1-9 (ranging from 2004-2022), excluding wave 3. To account for the underrepresentation of nursing home residents in the SHARE sampling scheme (Barczyk & Kredler, 2019), we recalibrate the cross-sectional survey weights to match the institutionalized populations, as in Banks et al. (2023) and Brugiavini et al. (2023). In the LTC module of microWELT, we quantify LTC needs in hours at the individual level and record the level and type of assistance provided. Measuring LTC needs in hours offers a significant advantage in analyzing LTC needs because it allows us to integrate the demand and supply sides and identify potential gaps between the required and provided LTC assistance. Since hours of care need are not directly available in the SHARE data, we implement a two-step procedure to measure LTC needs in hours. First, we identify the type of mental and physical limitations for each SHARE survey respondent as Activity-based Daily Limitations (ADLs) and Instrumental ADLs (IADLs). Second, we convert the set of ADLs and IADLs into the number of monthly hours of care needed. To do

so, we draw on a unique administrative source, the Austrian Care Needs Assessment (ACNA) scheme (see Appendix Table 2) that is used in Austria to determine eligibility for long-term care allowance and apply the same procedure to the limitations of respondents in both countries.[4] Finally, we obtain the total number of monthly hours of care needed.

SHARE does not directly identify the full care mix and care gaps in hours and does not measure all care types consistently across waves, which is why we follow the approach by Warum et al. (2025) applying imputations and a decision tree (see Appendix Figures 11 and 12) to obtain the information needed for the estimation of the home care mix parameters further discussed below. Most importantly, having established individual care needs in hours as discussed in the previous paragraph, this approach relies on the assumption that partners who are able to care or other household members cover any individual care needs not covered by formal home care or other informal care from outside the household.[5] This assumption is necessitated by the absence of a SHARE question that directly measures the intensity of informal care provided within households. As we only model nuclear families in the simulation, care from household members other than partners counts as care from outside the household in our results. The implication of our assumptions regarding the home care mix is that the care gaps we report can be regarded as lower bound estimates, since there are no individual care gaps as soon as spouses without high care need or other household members are present.

SHARE is also used to improve the realism of the age and partner age variables of older adults in the starting population. Since the age variable in EU-SILC is typically top-coded at 80, we impute age for individuals above this threshold. We use the previously discussed SHARE based parameter on the female partnership probability given age and Eurostat population figures to calculate the conditional probability of age given partnership status for women. This probability is used to randomly assign age to women above the EU-SILC threshold. Next, we use the model parameter for male age given spouse age to randomly assign age to men in partnerships and apply a correction procedure to meet Eurostat population figures as well as to randomly assign ages to men in partnerships.

3.2 Modelling

MicroWELT (www.microWELT.eu) is a comparative microsimulation platform that reproduces official (Eurostat) population projections while adding individual-level detail. The model starts from a representative cross-section of a country's population in the base year and simulates individual life histories in their family context over time. The model version used in this paper integrates modules on fertility, mortality, education, partnerships, family composition, migration and LTC. Detailed parameters for each of these processes are estimated from comparative survey data and outcomes are then stochastically assigned to individuals in the simulation. Projections therefore usually rely on status quo assumptions or illustrate the effects of parameter changes in what-if scenarios. The main drivers of change in projection results are increasing longevity, increasing childlessness and the expansion of education.

Partnerships are modelled from the female perspective, taking into account age, the presence and age of children in the family, and education. Partners are matched by assortative mating, using current distributions of age differences and education. This paper studies the sensitivity of caregiving arrangements and projections to the availability of a partner by means of different scenarios for partnerships above age 65 which are further discussed in Section 3.3 below. Our baseline scenario assumes that women maintain currently observed age-specific probabilities of being in a partnership and unions are formed and dissolved to align with these targets in the future (these parameters are illustrated in Appendix Figures 16 and 17).

[4] To align the assigned hours of care needed with those observed in Austrian statistics, the assessment algorithm also includes a calibrated age polynomial assigned to individuals conditional on having any limitation.

[5] We define that partners are able to care if they need less than 180 hours of care per month themselves, which corresponds to the highest level in the Austrian LTCA system.

We observe that there are more partnerships above the age of 65 in our EU-SILC based starting population when compared to data from SHARE. To maintain consistency in our analysis of LTC 65+ that is based on SHARE, we thus calibrate partnerships above 65 once at the start of the simulation (for each scenario) to align with the female age-specific partnership probability parameter (Appendix Figures 16 and 17).

To parametrize an additional scenario on new union formations for women aged 65 and over, we compute transition rates from SHARE data. In constructing the parameter, the population at risk is defined as the number of women in a given SHARE wave aged 65+ who are not currently living with a partner. We then determine, for each pair of consecutive survey waves (excluding wave 3), the share of women living with a partner in the following wave. The rates are computed for 5-year age groups and weighted using the adjusted survey weights. We find limited evidence for union formation above 65, with rates slightly higher in Austria than in Italy, and caution that our estimates are based on few available observations (see Appendix Section A.2).

The LTC module is a cross-sectional imputation model that updates individual care needs and supply on a monthly basis by age, sex, education and other characteristics. Following the approach of Warum et al. (2025), care needs, the care mix received (nursing home, formal and informal home care) and the potential care gap (unmet demand) are all quantified in hours at the individual level.[6] Subsequently, the LTC module is parametrized and implemented in five steps (Figure 7). First, the probability of requiring any care by age, sex and education is estimated (Figure 8). In the model, this parameter serves as a threshold and random draws from a uniform distribution decide whether an individual above 65 needs any LTC. Second, quantile regressions are used to estimate decile means of the number of hours of care needed by age, sex and education (Figure 9). Individuals in need of care are subsequently randomly allocated across deciles to determine their care need in hours. The third step considers the probability of being in a nursing home by age, sex, care need, presence of a partner and number of children (Figure 10). In the model version used here, nursing home admission is decided randomly based on the estimated probability threshold (corresponding to currently observed patterns) and not subject to supply constraints. In the fourth step, the probability of receiving any home care is implemented by hours of care needed, having a caring partner and children (Figure 13) and the parameters for the individual home care mix are computed as the share of total hours received for each care type within several subgroups (depending on care need, the presence of a caring partner and the number of children) (Figure 14). If no caring partner is available, the individual probability threshold is used to determine randomly whether home care is received. Next, the home care mix is assigned deterministically based on the parameter and individual characteristics. Lastly, the parameter on average hours of informal care provided to adults outside the household is obtained by age and sex (Figure 15). In the model, each individual provides care according to this parameter.

The LTC module applies status quo assumptions and the aforementioned parameters remain constant over time while the composition of the population changes. Our results indicate how the supply of LTC hours across the different types of care would have to be adjusted to provide care according to currently observed patterns. Regarding institutional care, we implicitly assume that the number of available nursing home places will increase by a corresponding amount to meet the demand, as determined by the observed individual-level probabilities of residing in a nursing home. For formal and informal home care, we separate current supply from additionally needed supply to highlight potentially arising care gaps. For our main results reported in this paper, we additionally check whether such "supply shortfalls", arising from formal or informal home care demand that is higher than current supply, could be covered by care-giving spouses.[7] The difference between the total projected hours of care needed and the total projected hours of care supplied (in institutional care as well as through home care supplied by formal caregivers, partners or informal caregivers from outside the household) is what we refer to as care gap.

[6] See Section 3.1 for further details.

[7] This is in line with our assumption that partners cover any remaining care needs discussed above.

3.3 Defining scenarios

In our *baseline scenario* S0, life expectancy continues to improve as in the official population projections by Eurostat. Women retain today's probability of being in a partnership by age and education. In this scenario, partnerships are dissolved to maintain today's female partnership probability even if (former) spouses continue to live on. This resembles the point where spouses would have died according to current mortality patterns. Scenario S0 establishes a status-quo benchmark that considers both increased longevity and unchanged partnership durations.

In scenario S1 (*current mortality*), mortality rates are kept constant, while partnership probabilities are identical to the baseline scenario. Thus, a comparison of S0 and S1 isolates the additional hours of care needed because people will live longer.

Scenario S2 (*no union formation*) assumes that life expectancy increases while partnership dynamics are disabled for people over 65 years of age. Thus, individuals maintain their union status from their 65th birthday onwards, with no late-life re-partnering and or further breakups except in the event of a partner's death. Unlike S0, S2 demonstrates the longevity effect due solely to partners living longer, regardless of any behavioural changes in late life.

Finally, scenario S3 (*union formation*), allows individuals aged 65 and older to form new unions at rates observed for people in the same age group. By comparing S3 with S2, we can quantify the additional partner care that becomes available when late-life union formation is possible, given the same longevity profile. We do not model additional union dissolutions in S3, as official statistics suggest that these events may be rare.[8]

4 Results

4.1 Descriptives and partnership related simulation results

In both countries, the likelihood of receiving home care increases with the intensity of need and depends on the presence of a partner (by design) and the number of children (see Figure 13 in the Appendix for a detailed illustration). At low levels of care need, the probability of receiving care is higher in Austria (45-50%), than in Italy (38%–40%), suggesting that there is better access to care at lower need thresholds in Austria. In both countries, individuals with children are slightly more likely to receive care than those without, particularly at lower to medium levels of need.

When a caring partner is present, the partner provides most of the care hours in both countries—a pattern that is particularly pronounced in Italy.[9] In both Austria and Italy, about half of the partners who provide care provide less than 30 hours per month and another quarter provides between 30 and 60 hours, while the rest may provide significantly more.[10] In the absence of a caring partner, the proportion of care provided by informal caregivers outside the household increases significantly. The usage of formal home care rises with higher care needs, especially when a partner is absent. This increase is more pronounced in Austria, where formal care plays a stronger role. The care gap also becomes more evident at higher need levels without a partner, suggesting that some care needs remain unmet. The figure underscores the pivotal role of family members, particularly partners and children, in addressing care needs in both countries, though

[8] According to the Register-based Labour Market Statistics, there were 449,061 women aged 65 and older who were either married or in a registered partnership in Austria in 2022. In the same year, only 356 women were divorced (including dissolution of registered partnerships) according to Statistics on Divorces and Dissolutions of Registered Partnerships (Statistics Austria). As of January 1, 2022, 5,421,176 women aged 60 and over were married in Italy, compared to just 10,840 divorces in the same age group (ISTAT).

[9] Figure 14 compares the home care mix in Austria and Italy by assessed need level, presence of a partner, and number of children.

[10] Appendix Figures 26-29 show the projected distribution of care hours provided by partners by decade and sex in Austria and Italy for different scenarios.

Austria relies more heavily on formal care. Gaps in care provision are most visible when neither a partner nor children (or only one child) are available.

Considering the composition and evolution of informal care networks, our simulation results show significant increases in the number of individuals without partnerships in older age groups.[11] The projections highlight significant demographic shifts in Austria and Italy, including an increase in the number of individuals without partnerships or children. Comparing S0 and S3 shows the effect of allowing new union formations, which results in a higher percentage of partnerships. This effect is slightly stronger in Austria than in Italy.

Figure 24 in the Appendix plots the projected average years spent in partnership for persons aged 65+ by cohort, sex and education in Austria and Italy.[12] In line with our scenario definitions, time spent in partnership is lowest in scenario S1, due to stagnant life expectancy, though the deviation from our baseline scenario is quite small. On the other hand, scenarios S2 and S3 show a significant increase in the time women above age 65 spend in partnerships, with a pattern that corresponds to the increase in life expectancy. By definition, time spent in partnership above age 65 is highest in scenario S3, where we allow for new union formations.

For validation purposes, Figures 31 and 36 plot the share of persons aged 65 and over in partnerships by age, sex, education, time period and country. As expected, scenario S3, which allows for new partnerships to be formed from age 65 onwards, leads to higher shares of older individuals in partnerships over time compared to the baseline scenario S0. This result holds across sexes, education levels and countries. Figures 37 and 38 plot the distribution of male partner's ages by female partner's age, scenario and country. Compared to scenarios S0 and S1, the distributions of male partner's age in scenarios S2 and S3 show deviations from the parameter.

4.2 Simulation results on spousal caregiving and the care mix

This section presents the results of applying the dynamic microsimulation model to assess the future of long-term care (LTC) in Austria and Italy. Using 2018 as the base year, the projections extend through to 2070, providing a detailed analysis of evolving LTC needs and the composition of care provision. The findings discussed here reflect the baseline scenario outlined in the previous section.[13]

Figure 1 summarizes the results of the baseline scenario, which assumes longevity gains and unchanged partnership behaviour. It illustrates the increase in projected care hours needed and received by providers. Total hours are scaled to one in the first projected year (2018). Projected LTC supply values are reported as positive shaded areas, and additional required LTC supply (or gaps) are indicated as negative shaded areas. The solid black line indicates total care need, and the dotted line indicates the remaining gap if partners are assumed not to cover the resulting LTC supply gaps. Supply gaps occur for formal home care and informal home care provided by others than the partner because we assume that these care types will follow current patterns.

The figure shows that care needs are expected to roughly double in Austria by 2070, whereas in Italy, they are expected to increase by about 45 percent. This difference is due to Italy already being more advanced in the process of population ageing. However, despite the larger increase in LTC needs in Austria, care gaps increase similarly in both countries. This is largely because Italy relies more on informal care from outside the household and its population is expected to decline. As will be further discussed below, the slight expansion of partner care is hardly noticeable in this illustration. This expansion is driven by an increase in

[11] Figures 20 to 23 present projections of population shares by partnership status and number of children.

[12] Appendix Figure 25 additionally shows projected life expectancy at age 65 by cohort, sex, education and country.

[13] It is important to note that all projected values represent averages over multiple (8) simulation runs with a simulated population size of initially 450.000 persons. This is a simulation size sufficiently large to eliminate Monte Carlo variation in the presented results.

care needs and an increase in partnerships arising from the growth of the population aged 65 and older, as more women maintain partnerships corresponding to today's age-specific partnership probabilities.

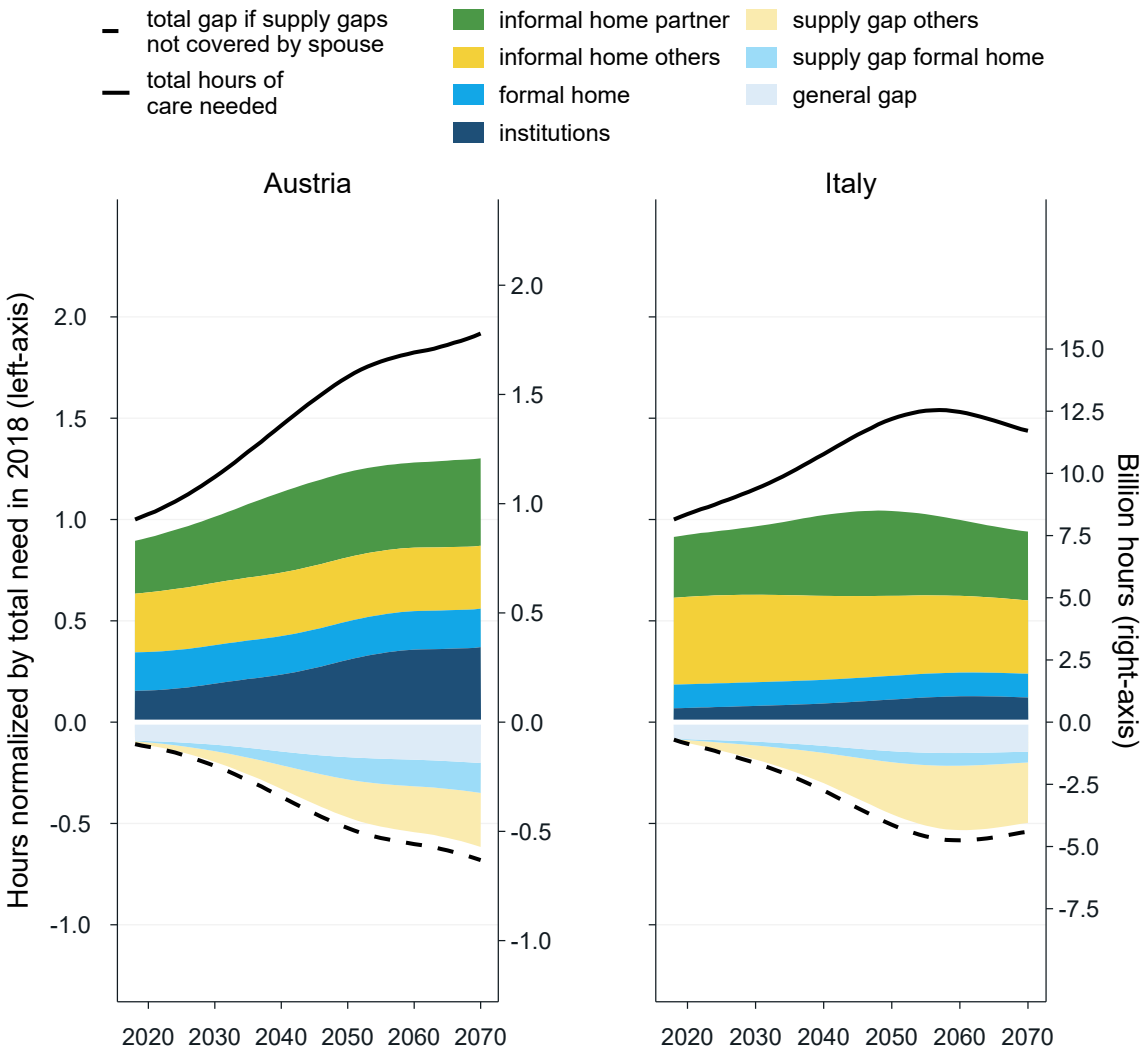

Fig. 1 Projected hours of care needed and the care mix received in Austria and Italy relative to the base year 2018 – Scenario 0 (S0) baseline

Figure 2 below shows the current mortality scenario S1, in which current mortality rates and partnership probabilities by age and education remain unchanged. When contrasted with scenario S0, this scenario highlights that most of the expected increase in care needs can be attributed to increasing longevity. Under the current mortality assumption, care needs in Austria would only increase by about 35 percent, due to the growth of the population aged 65 and over. In Italy, care needs would increase only modestly until about mid-century and return to the current level by the end of our projection period.

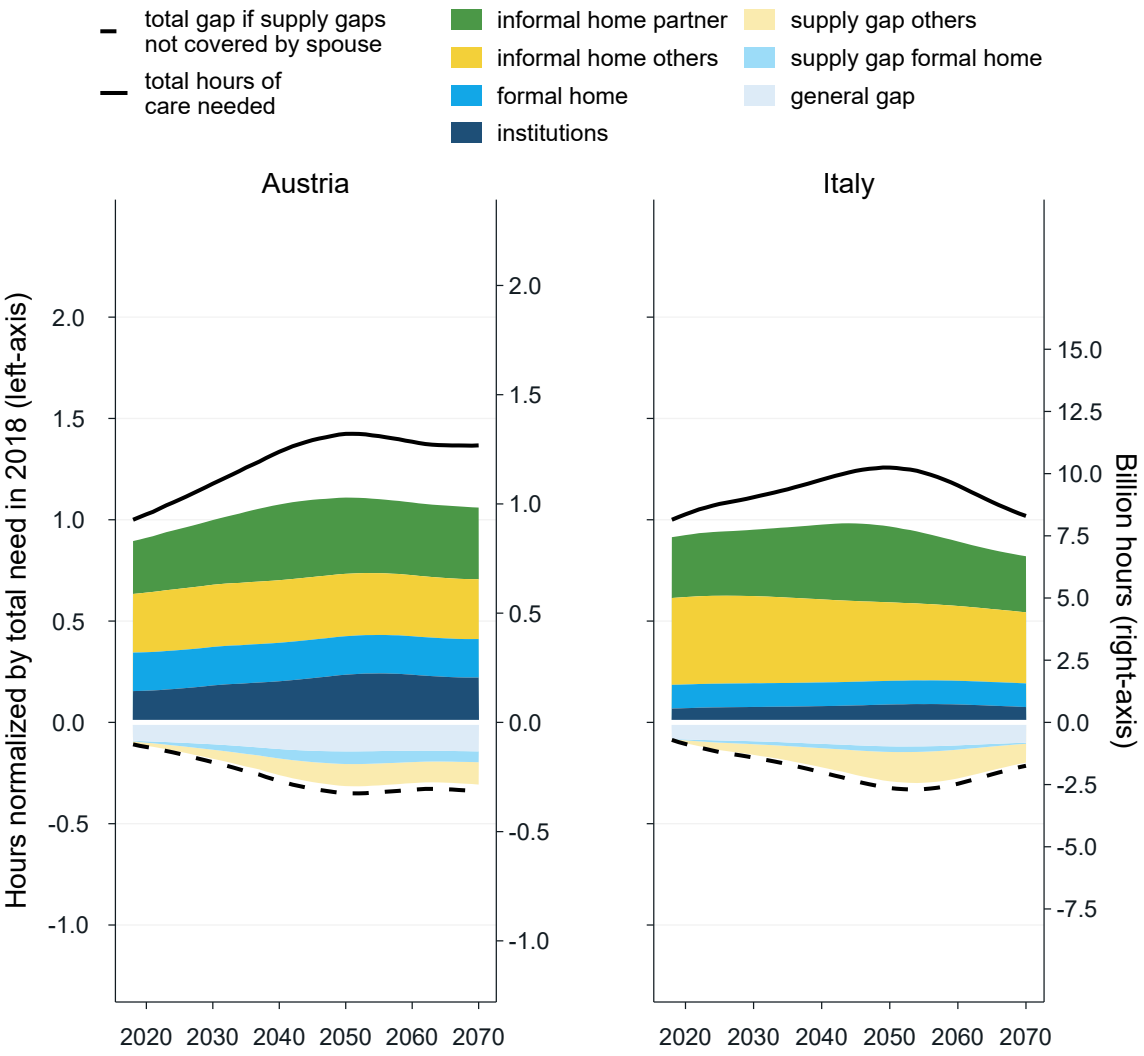

Fig. 2 Projected hours of care needed and the care mix received in Austria and Italy relative to the base year 2018 – Scenario 1 (S1) current mortality

Unlike the previous scenarios, S2 (the no union formation scenario that assumes an increase in life expectancy and no union formation above the age of 65), shows a more noticeable increase in partner care hours in Figure 3. This difference with respect to S0 is due solely to the alignment of union formations and dissolutions being disabled at age 65, which permits partnerships to persist until death. Thus, S2 illustrates the impact of increased longevity on the additional availability of informal partner care supply.

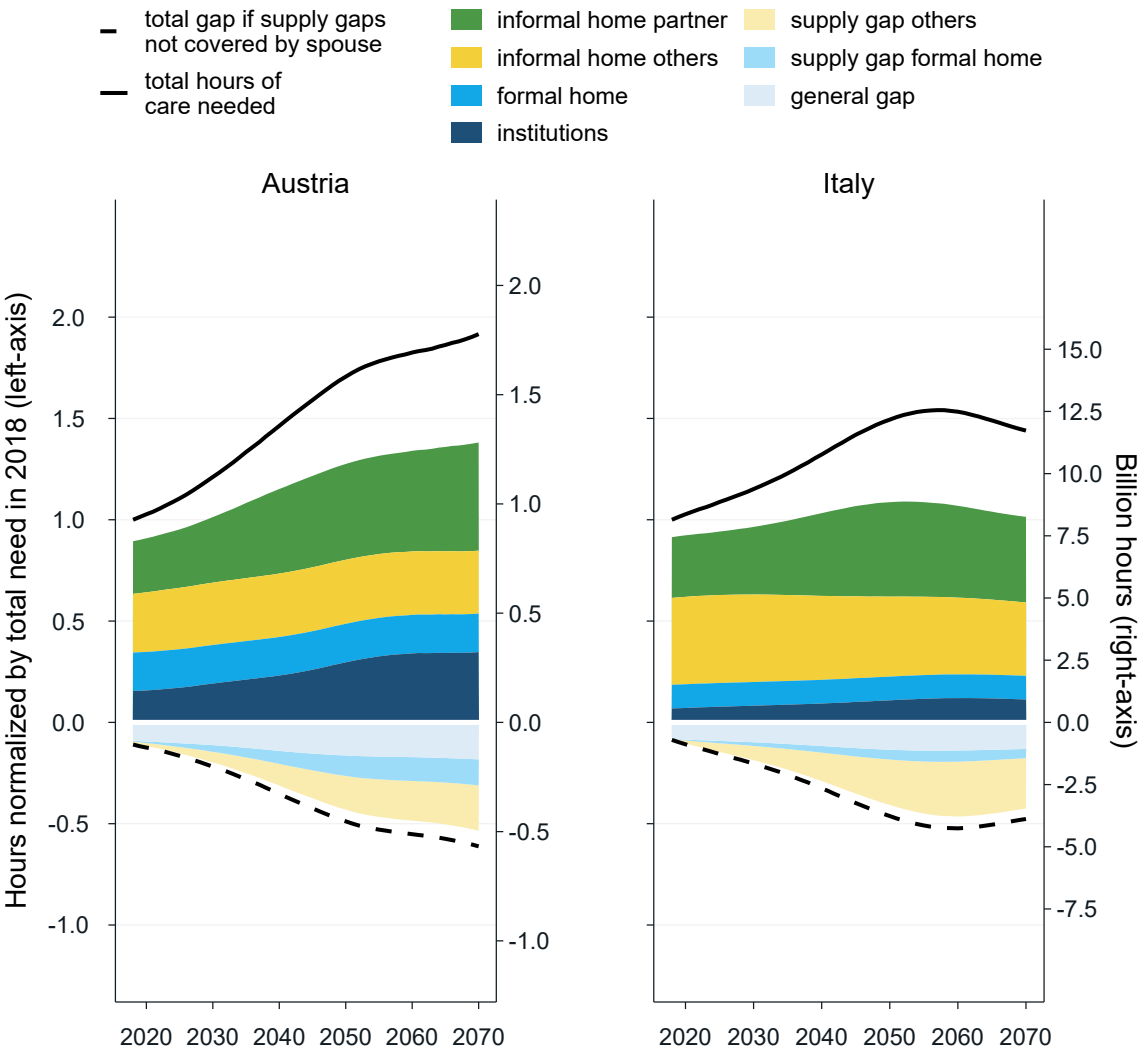

Fig. 3 Projected hours of care needed and the care mix received in Austria and Italy relative to the base year 2018 – Scenario 2 (S2) no union formation

Finally, the union formation scenario S3 in Figure 4 illustrates the impact of permitting union formation above age 65, based on current patterns. As expected, this scenario results in the greatest increase in partner hours. Additionally, there is a slight reduction in the overall care gap, as more partnerships reduce the number of people experiencing full care gaps.

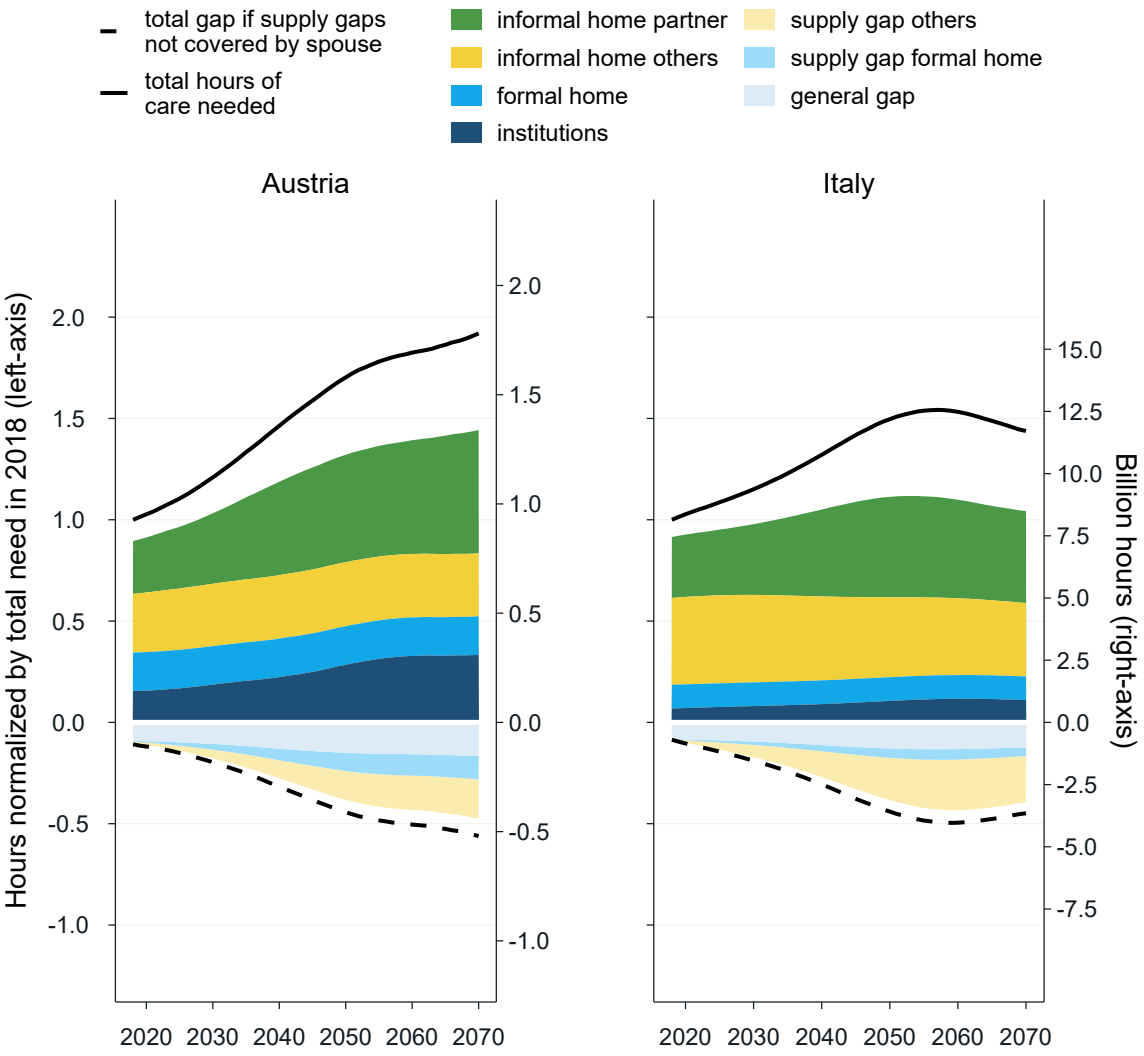

Fig. 4 Projected hours of care needed and the care mix received in Austria and Italy relative to the base year 2018 – Scenario 3 (S3) union formation

Figure 5 shows the relative changes in care hours from partners compared to 2018 for all scenarios, while Figure 6 removes hours arising from supply gaps that may be covered by partners. The largest change in partner hours occurs in S3, while the smallest change (or even a negative change in the case of Italy) occurs in S1. Since S0 and S1 both use current age-specific partnership probabilities for women, the difference in partner care hours is directly attributable to the effect of increased longevity on the hours of care needed. The higher levels of spousal caregiving in S2 and S3 compared to S0, in turn, are the consequence of the assumptions about partnerships for those aged 65 and older. We note that the rise in spousal caregiving only exceeds the rise in total LTC care needs in S3 when additionally including the coverage of LTC supply gaps.

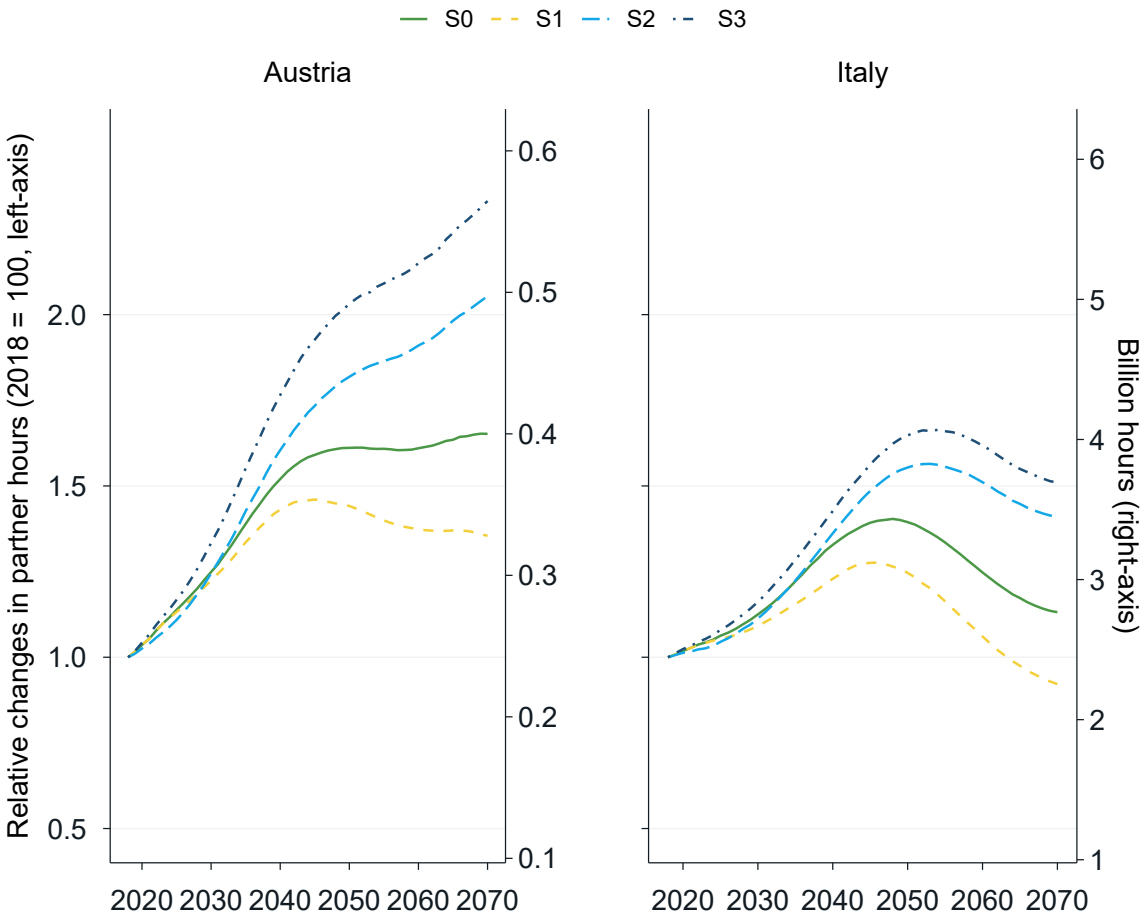

Fig. 5 Scenario comparison of projected hours of care provided by partners (relative to partner hours in 2018) under the assumption that partners cover potential supply gaps

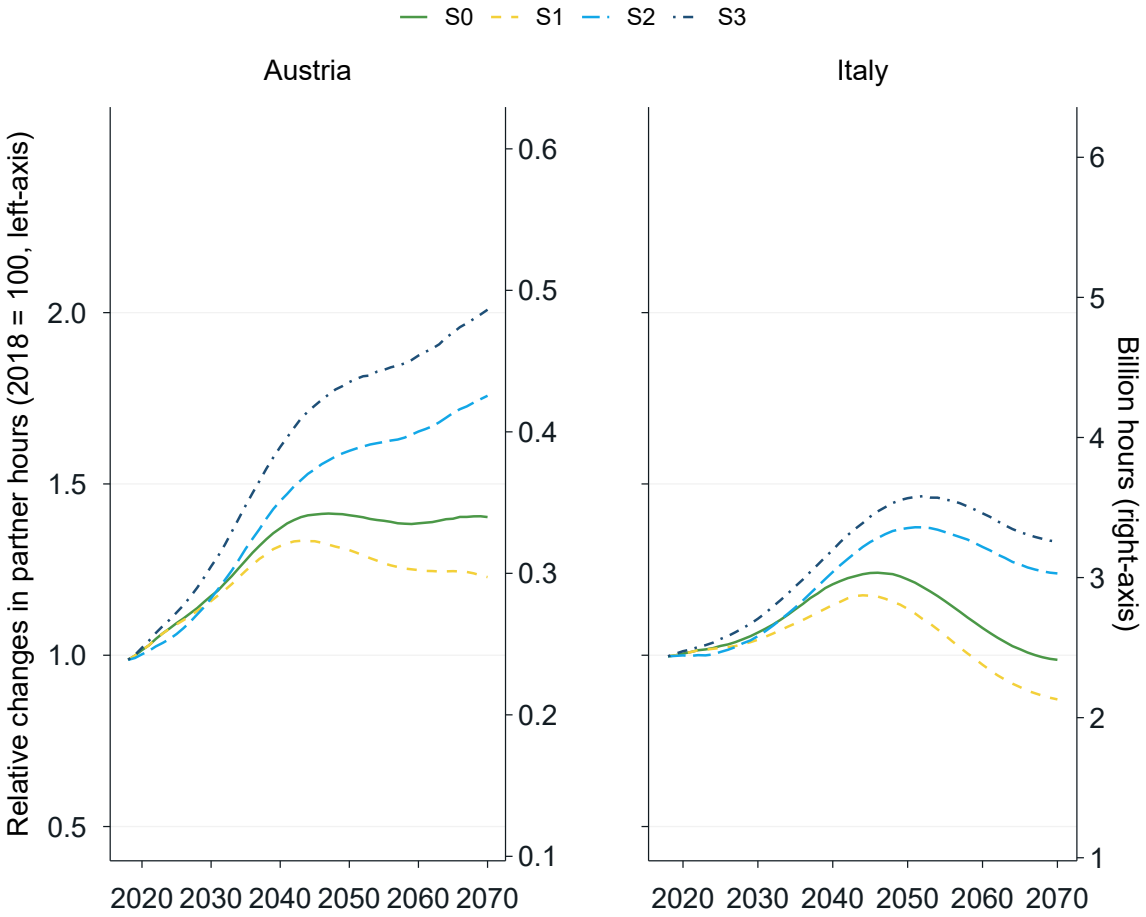

Fig. 6 Scenario comparison of projected hours of care provided by partners without the assumption that partners cover potential supply gaps (relative to partner hours in 2018)

The implications of the different scenarios for the total care gap, i.e. the difference between total hours of care needed and supplied as a ratio of total hours needed, are illustrated in Appendix Figures 18 and 19. From levels of about 10 percent in Austria and 9 percent in Italy in 2018, the total care gap under scenario S0 increases to approximately 32 percent in Austria and 35 percent in Italy by 2070. Increased spousal caregiving due to improving longevity of partners in S2 reduces the care gap to 28 percent in Austria and 30 percent in Italy. Allowing for union formation above 65 (S3) further brings down care gaps to 25 and 27 percent respectively. In all these scenarios, care gaps remain above levels observed in scenario S1 (where mortality remains unchanged) at 22 percent in Austria and 20 percent in Italy and substantially above levels in 2018.[14] Another perspective on this result is illustrated in Appendix Figure 30 showing the projected care mix relative to total needs. This figure highlights that increased partner longevity keeps the share of spousal caregiving roughly constant (compared to S0, where it declines) and that additional union formation above 65 only modestly expands its role in the overall care mix.

[14] Total care gaps increase across all scenarios when supply shortfalls in formal home care and outside informal care are not covered by partners by about 4 percent in Austria and 3 percent in Italy (Figure 19).

5 Discussion

Our results provide crucial insights into the evolving landscape of long-term care provision in ageing societies, demonstrating that despite increased longevity creating larger pools of potential spousal caregivers, care gaps will continue to expand significantly in both Austria and Italy through 2070. The microsimulation analysis reveals that demographic transitions, partnership dynamics, and institutional differences fundamentally shape the availability and sustainability of informal care arrangements within households.

Interpreting the magnitude and drivers of increasing care needs and gaps

The projected doubling of care needs in Austria versus the 45% increase in Italy by 2070 reflects these countries' different stages in the demographic transition, with Italy already experiencing advanced population ageing while Austria faces an accelerating ageing process. This finding aligns with projections from the European Commission's Ageing Report, which anticipates substantial increases in long-term care expenditure across EU member states. However, our results demonstrate that the relationship between care need growth and care gap expansion is not straightforward, as both countries experience similarly expanding care gaps despite different trajectories in overall care demand.

The scenario analysis reveals longevity gains as the primary driver of increased care needs, accounting for most of the projected expansion in both countries. If mortality rates were to remain constant (S1), care needs in Italy would return to the current level at the end of the projection period, while growth would be substantially reduced in Austria, with approximately 65% of the projected increase in the demand for care hours stemming from improved life expectancy. This finding supports previous research that identified longevity as a fundamental challenge for care systems, even when the pool of potential spousal caregivers increases due to longer life expectancy (Cattaneo et al., 2025; Happich et al., 2022).

Relative to the current level of care provided by partners/spouses, we can expect a substantial increase in informal care supplied within the household. While longer-lived partnerships increase the availability of spousal care, the absolute magnitude of this effect however remains limited compared to the overall expansion in care needs. In our (conservative) baseline scenario, between 2018 and 2070 the number of care hours provided by partners increases by about 65% in Austria and 13% in Italy. In the most expansive scenario (S3), the number of hours more than doubles in Austria and increases by 50% in Italy. These relative changes have a positive impact on the care supply gap, but they can not alter the fundamental upward trajectory of care gaps.

The relatively modest impact of partnership dynamics on overall care provision reflects the complex interplay between demographic forces. Scenario S3, which allows for new union formation among older adults, demonstrates only marginal improvements in care coverage. When compared to the baseline (S0), the total care gap in 2070 is about 7 percentage points lower in Austria and 8 percentage points lower in Italy. This suggests that late-life re-partnering cannot substantially mitigate growing care gaps despite its potential benefits for individuals who do form new partnerships.

Institutional and cultural contexts shaping care arrangements

The comparison between Austria and Italy illuminates how institutional frameworks and cultural norms influence informal care patterns and system vulnerabilities. Italy's heavier reliance on informal care from outside the household (mostly from children), reflecting its position within the southern European care regime, creates particular exposure to demographic pressures as the pool of potential family caregivers contracts. This finding supports research by Haberkern and Szydlik (2010) demonstrating the north-south gradient in European care provision, where southern countries depend more heavily on family-based arrangements.

Austria's more developed formal care infrastructure, evidenced by higher nursing home utilization rates

and more comprehensive home care services, provides greater buffer capacity against demographic pressures. However, even Austria's relatively robust formal system cannot compensate for the projected expansion in care needs, highlighting universal challenges facing European long-term care systems regardless of their institutional design. The similar care gap trajectories in both countries, despite their different starting points and institutional arrangements, suggest that demographic pressures may ultimately overwhelm system-specific advantages.

Policy implications for sustainable care systems

Our findings have significant implications for long-term care policy development in ageing societies. Spousal care will continue to represent an important pillar of the LTC mix in European societies. The expected increase in life expectancy opens the prospect for additional informal care provided by spouses and partners. The extent to which this additional care potential can actually be realised will also depend on the specific policies and support programs. This concerns, for example, the compatibility of caring responsibilities and work commitments. Increasing female labour force participation and the extension of working careers, which was not examined in this study, plays a particularly important role in this regard.

On the other hand, the persistent expansion of care gaps across different scenarios indicates that policy strategies emphasizing informal care expansion may be insufficient to meet future needs. Policies supporting informal caregivers, while valuable for individual wellbeing and system sustainability, cannot fundamentally alter the demographic mathematics underlying care supply constraints.

The limited impact of late-life union formation on overall care provision suggests that policies promoting social connections among older adults, while beneficial for individual wellbeing, can only make a partial contribution to addressing overall care gaps. Instead, policymakers must focus on expanding formal care capacity while developing innovative models that effectively combine formal and informal care resources.

Our findings support arguments for comprehensive care system reforms that acknowledge the limits of informal care expansion and invest substantially in formal care infrastructure and workforce development.

Limitations and future research directions

Several limitations constrain the interpretation of our results. The projections assume stable care provision patterns and institutional arrangements, potentially underestimating adaptive capacity within care systems. Technological innovations, changing health trajectories, and evolving care preferences could substantially alter future care arrangements in ways not captured by our status quo assumptions. The focus on spousal care, while addressing a crucial component of informal care provision, does not fully capture the complexity of intergenerational care relationships that may evolve differently across cultural contexts.

Although we have corrected for the underrepresentation of nursing home residents in the SHARE data (Banks et al., 2023; Brugiavini et al., 2023), there is still the issue that we may underrepresent the most vulnerable populations and institutional care recipients. This could affect the accuracy of estimates of care needs and provision. Additionally, the scenarios examining partnership dynamics, while illuminating theoretical relationships, may not fully reflect the complex social and economic factors influencing late-life relationship formation and dissolution.

This research opens several avenues for future investigation that could improve our understanding of care system evolution in ageing societies. Longitudinal studies examining the actual trajectory of care preferences and arrangements among ageing cohorts would provide crucial validation for projection models and insights into behavioural adaptation to demographic change. Cross-national comparative research extending beyond Austria and Italy could shed light on how different institutional and cultural contexts shape the relationship between demographic change and care system performance.

Future research should also examine the intersection between technological innovation and care provision, as assistive technologies, tele-health systems, and artificial intelligence applications may fundamentally alter the balance between formal and informal care requirements (Chapman et al., 2023; Wong et al., 2024). Studies investigating the economic implications of different care gap scenarios, including analysis of public expenditure trajectories and opportunity costs of informal care provision, would provide essential information for policy development (Løken et al., 2017; Maestas et al., 2024; Schmitz & Westphal, 2017).

Research examining the health and wellbeing implications of evolving care arrangements, particularly the effects of increased care gaps on both care recipients and informal caregivers, would contribute to a more comprehensive understanding of the societal implications of demographic change. Such studies could inform the development of policies that protect vulnerable populations while supporting sustainable care arrangements (Frimmel et al., 2023; Longobardo et al., 2023).

6 Conclusions

This paper applies a novel comparative microsimulation approach to address critical gaps in our understanding of how demographic trends, in particular population ageing and declining fertility, will affect spousal caregiving and the future care mix in ageing societies.

Our study demonstrates that demographic ageing presents fundamental challenges to long-term care systems that transcend institutional arrangements and policy frameworks. While increased longevity expands the pool of potential spousal caregivers, the simultaneous growth in care needs creates persistent and expanding care gaps that informal care arrangements cannot fully address. The comparative analysis of Austria and Italy reveals that countries with different institutional foundations face similar underlying demographic pressures, suggesting the need for comprehensive policy responses that acknowledge the limits of informal care expansion while investing substantially in formal care system development. These findings provide crucial evidence for policymakers developing strategies to address one of the most significant challenges facing ageing societies in the 21st century.

7 SHARE Acknowledgements

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This paper uses data from the generated easySHARE data set (SHARE-ERIC, 2024a), see Gruber et al. (2014) for methodological details. The easySHARE release 9.0.0 is based on SHARE Waves 1, 2, 3, 4, 5, 6, 7, 8 and 9.

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A Appendix

A.1 Parameters

Table 2 *Austrian care need assessment scheme.*

LIMITATION	SHARE VARIABLE	MONTHLY HOURS
Basic Assessment Scheme		
Activities of Daily Living (ADLs)		
Dressing	ph049d1	20
Walking AND getting up	ph049d2, ph049d5	30
Walking AND NOT getting up	ph049d2, ph049d5	15
NOT Walking AND getting up	ph049d2, ph049d5	22.5
Daily hygiene and bathing	ph049d3	35
Eating	ph049d4	30
Using the toilet	ph049d6	30
Instrumental Activities of Daily Living (IADLs)		
Preparing a hot meal	ph049d8	30
Shopping	ph049d9	10
Taking medication	ph049d11	3
House or garden work	ph049d12	10
Leaving home independently	ph049d14	10
Laundry	ph049d15	10
Motivational talk (Using a map OR Telephone calls OR Managing money)	ph049d7, ph049d10, ph049d13	10
Severe mental health limitations		
Dementia	ph006d16 (imputed)	45
Psychiatric problem	ph006d18, mh022 (proxied)	45
Supplementary Items		
Extra hours 1 (Climbing several flights of stairs without resting OR Stooping, kneeling, or crouching OR Reaching or extending your arms above shoulder level OR Pulling or pushing large objects like a living room chair OR Lifting or carrying weights over 5 kilos)	ph048d4, ph048d6, ph048d7, ph048d8, ph048d9	5
Extra hours 2 (Walking 100 metres OR Sitting for about two hours OR Getting up from a chair after sitting for long periods OR Climbing one flight of stairs without resting OR Picking up a small coin from a table)	ph048d1, ph048d2, ph048d3, ph048d5, ph048d10	10
Conditional Age Trend		
IF any limitation OR Global Activity Limitation Indicator (GALI)	gali, age	$(age - 65) * 0.73 + (age - 65)^2 * 0.042$

Notes: The basic assessment scheme is based on Austrian LTC legislation and guidelines, i.e. the Federal Care Allowance Act, the classification regulation, the directive for the uniform application and a consensus paper of institutional stakeholders. Our full assessment scheme additionally includes extra hours for additional limitations and a conditional age trend that is calibrated against Austrian care allowance statistics. Reproduced from Warum et al. (2025)

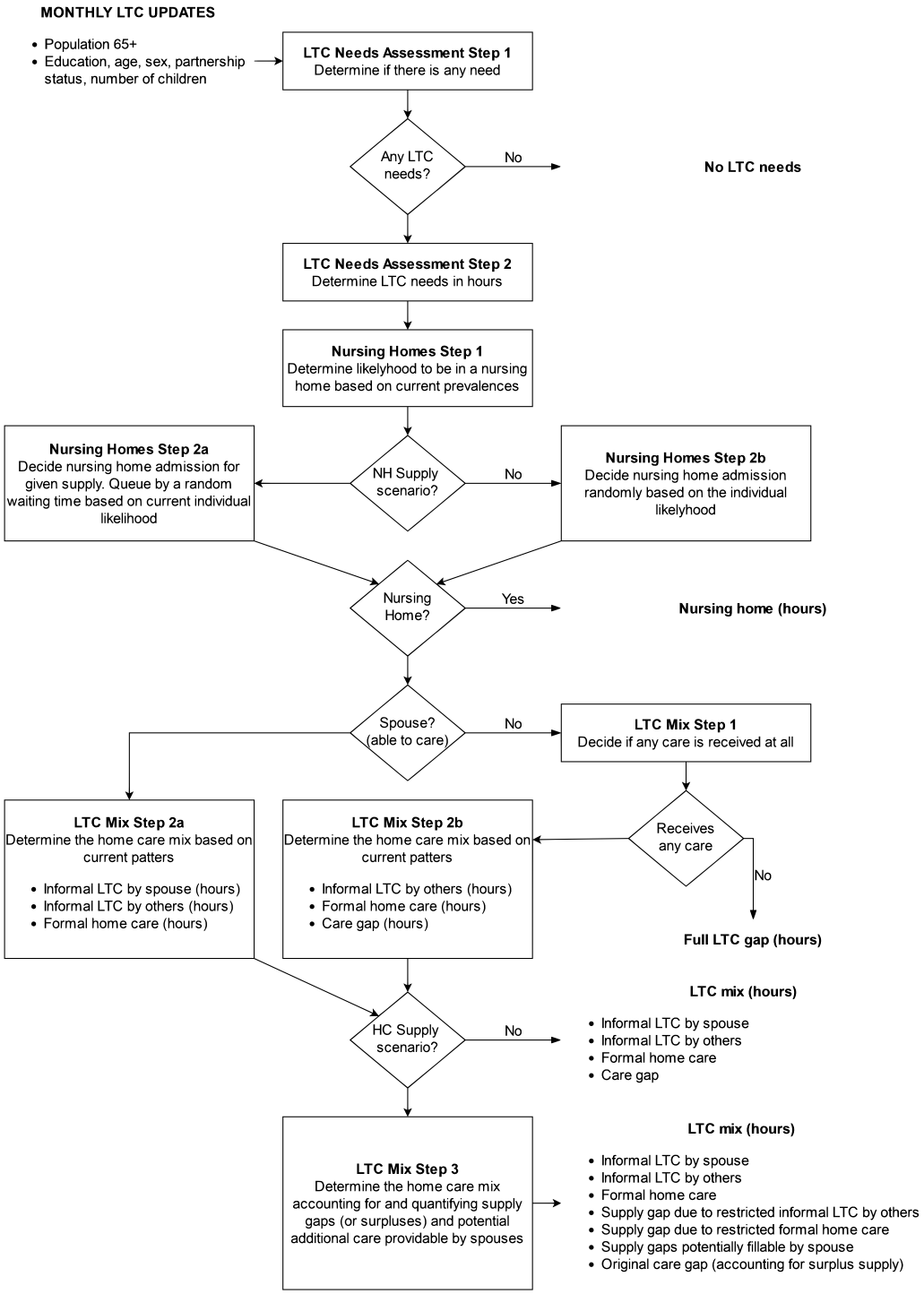

Fig. 7 Flowchart of the LTC module in microWELT. Reproduced from Famira-Mühlberger et al. (2025)

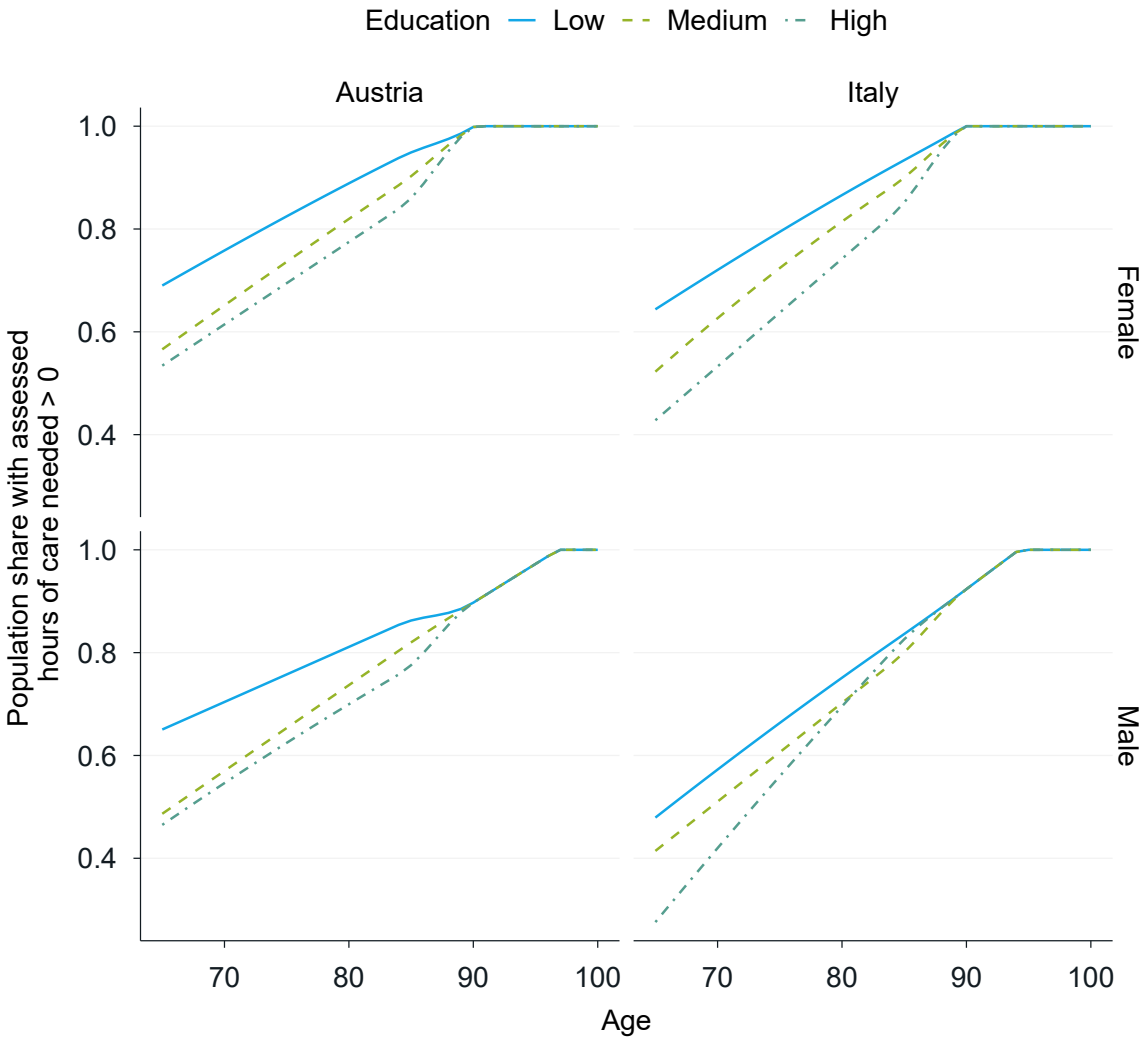

Fig. 8 Step 1 - Prevalence of positive assessed monthly care need by age, sex, education in Austria and Italy (weighted). *Notes:* We use monotone increasing P-splines to estimate smooth functions and stop differentiating by education from age 90 due to data sparsity at the upper end of the age range. Reproduced from Warum et al. (2025)

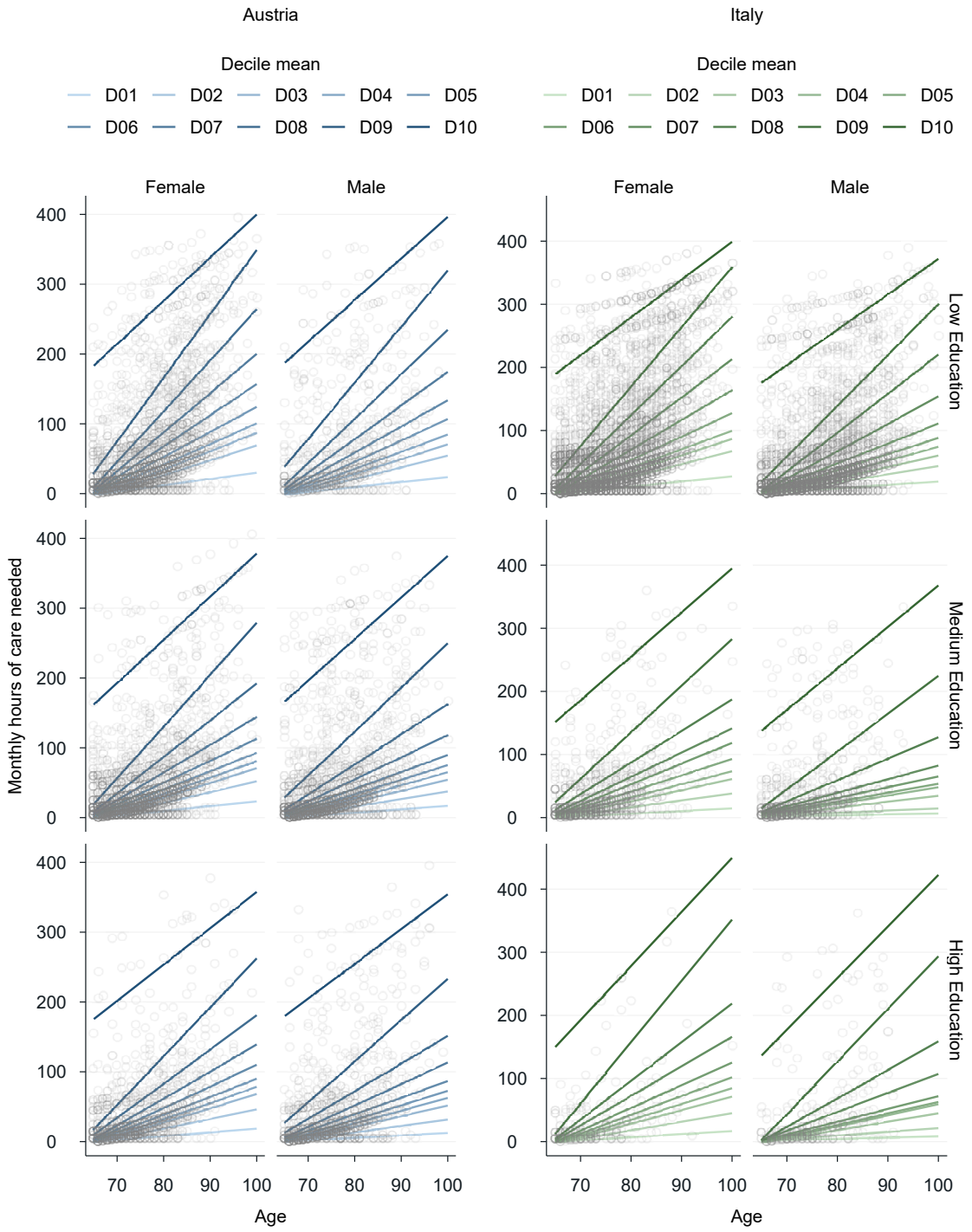

Fig. 9 Step 2 - Distribution of care need in hours by age, sex, education in Austria and Italy (weighted). *Notes:* Subsample: respondents with positive care need. Decile means computed from predictions of quantile regressions. As independent variables, we include age, sex and education as well as interaction terms between age and sex as well as age and education. Reproduced from Warum et al. (2025)

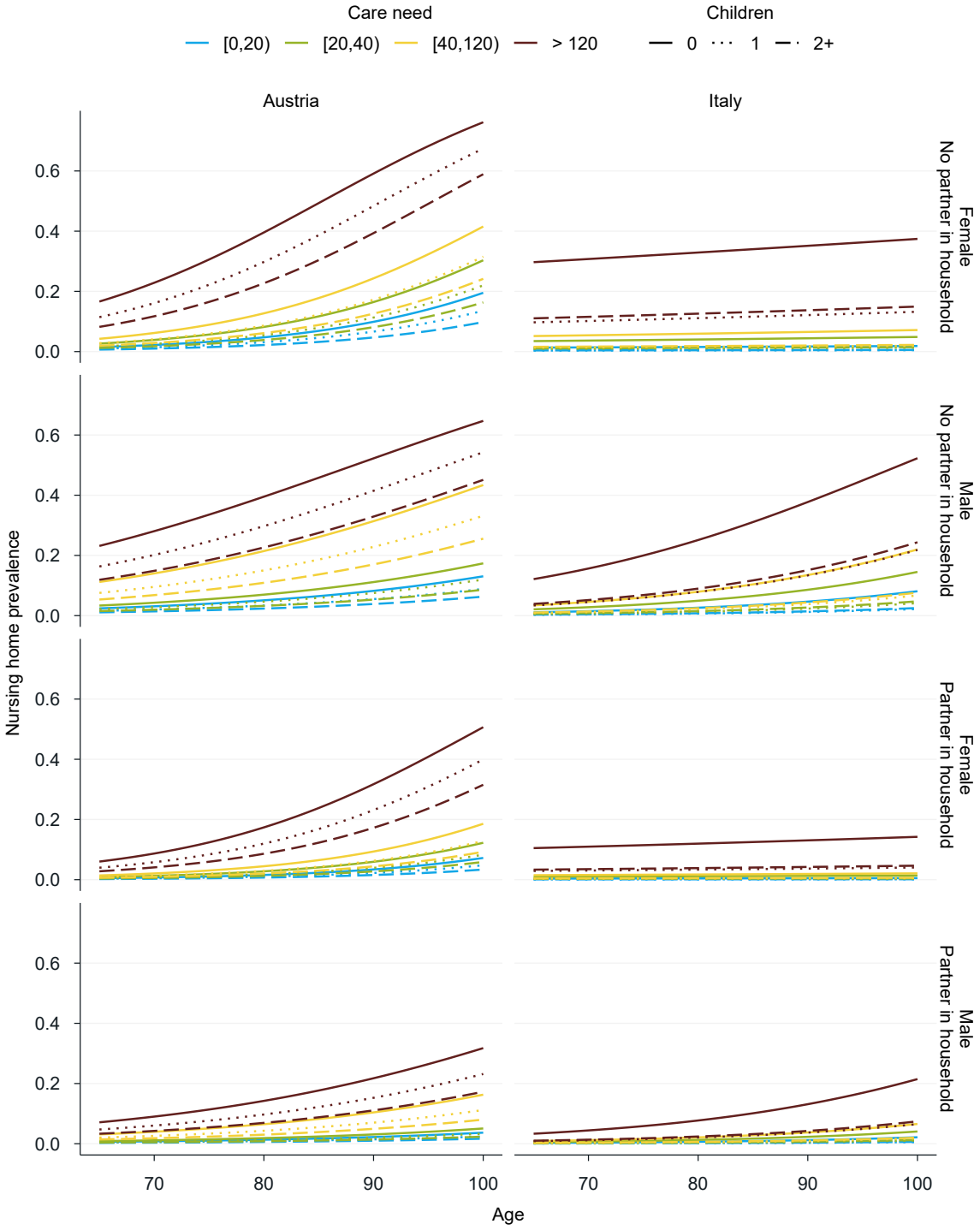

Fig. 10 Step 3 - Nursing home prevalence in Austria and Italy by age, sex, hours of care needed, partner, and children (weighted). *Notes:* The nursing home indicator is the dependent variable in a logistic regression that controls for age, sex, assessed hours of care need and whether an individual's partner is living in the household. The previous terms are allowed to vary by sex via an interaction term and we also add a separate categorical variable for the number of children. Reproduced from Warum et al. (2025)

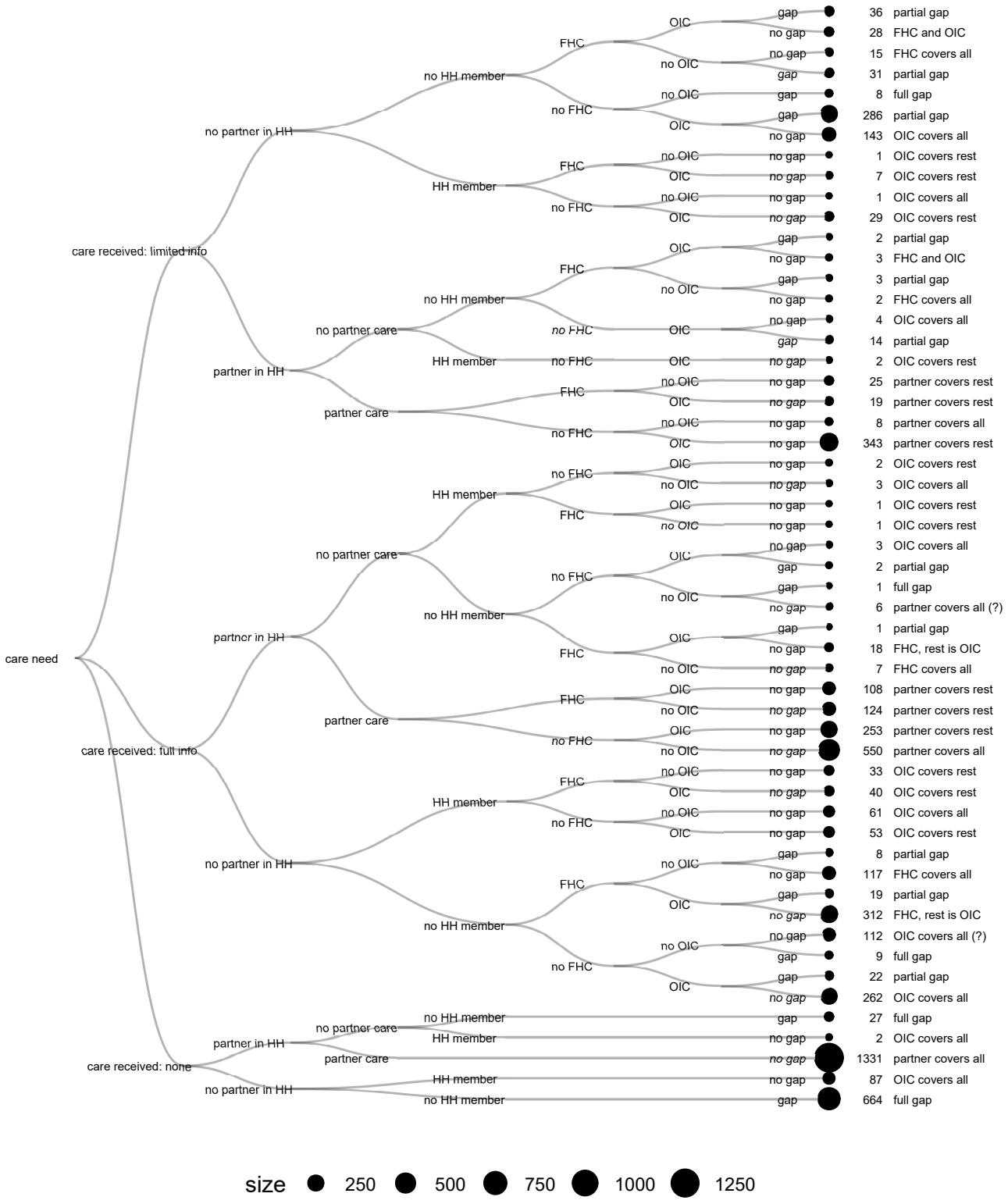

Fig. 11 Decision tree illustration of our approach to obtain the individual care mix in hours from SHARE for Austria. *Notes:* care received: (limited info, full info, none) refers to the care variables available per respondent. We distinguish Formal Home Care (FHC), Outside Informal Care (OIC), full or partial gaps and care from partners or other household (HH) members. Reproduced from Warum et al. (2025)

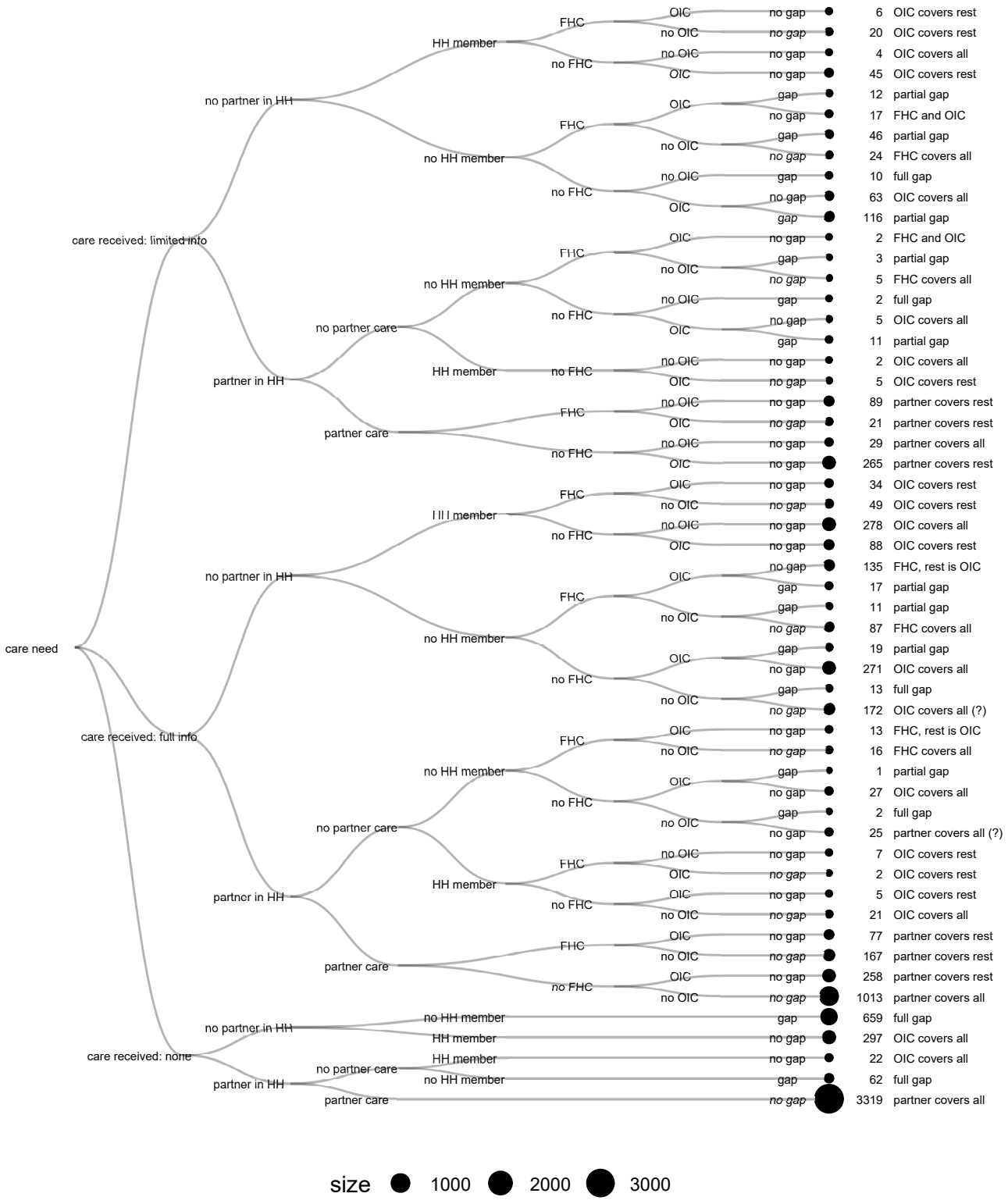

Fig. 12 Decision tree illustration of our approach to obtain the individual care mix in hours from SHARE for Italy. *Notes:* care received: (limited info, full info, none) refers to the care variables available per respondent. We distinguish Formal Home Care (FHC), Outside Informal Care (OIC), full or partial gaps and care from partners or other household (HH) members. Reproduced from Warum et al. (2025)

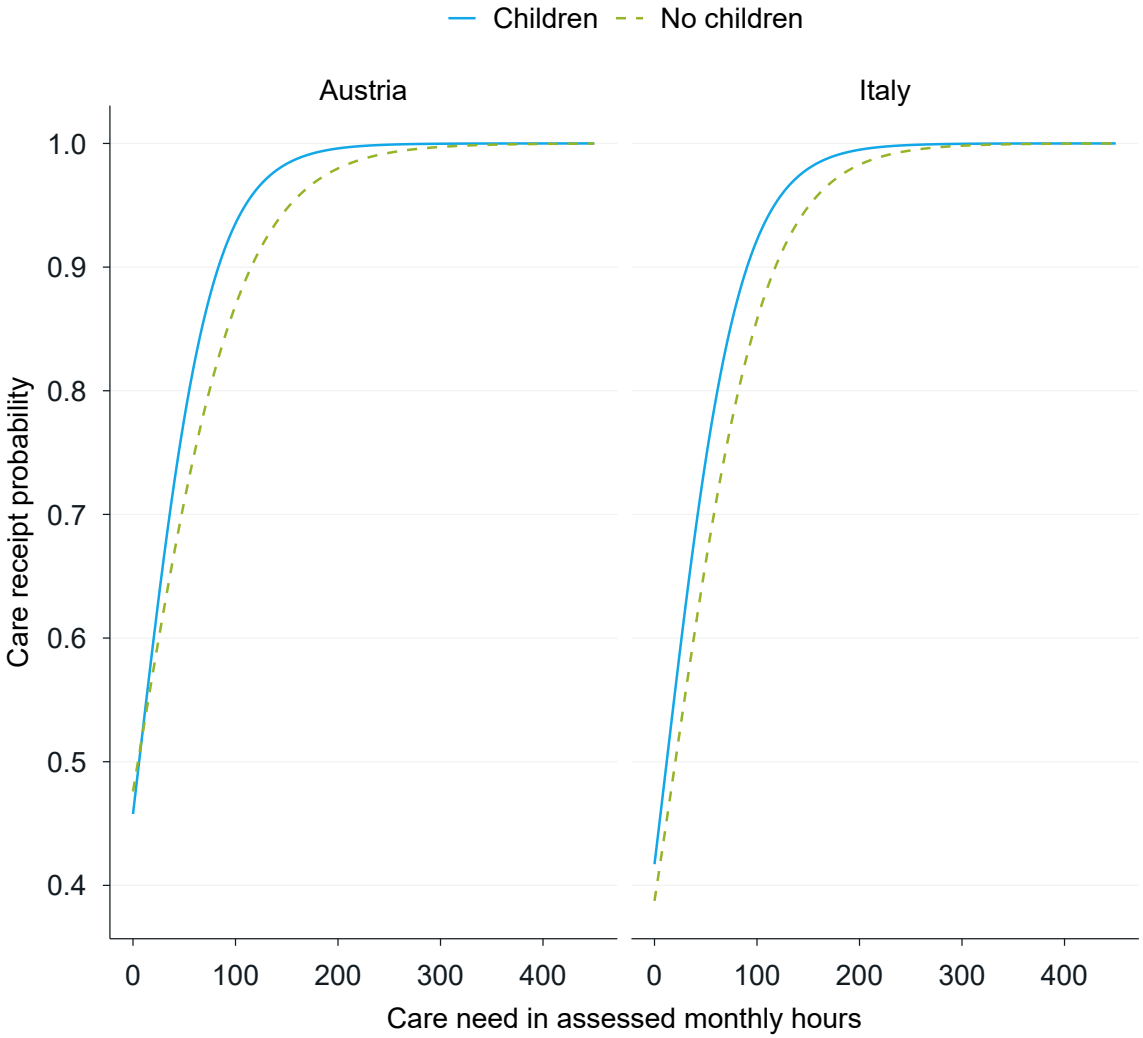

Fig. 13 Step 4 - Care receipt probability of individuals not in partnerships within the care need sample in Austria and Italy by assessed hours of care need and having children (weighted). *Notes:* We report predicted care receipt probabilities from a logit model interacting the covariates assessed care need, partner and children. Reproduced from Warum et al. (2025)

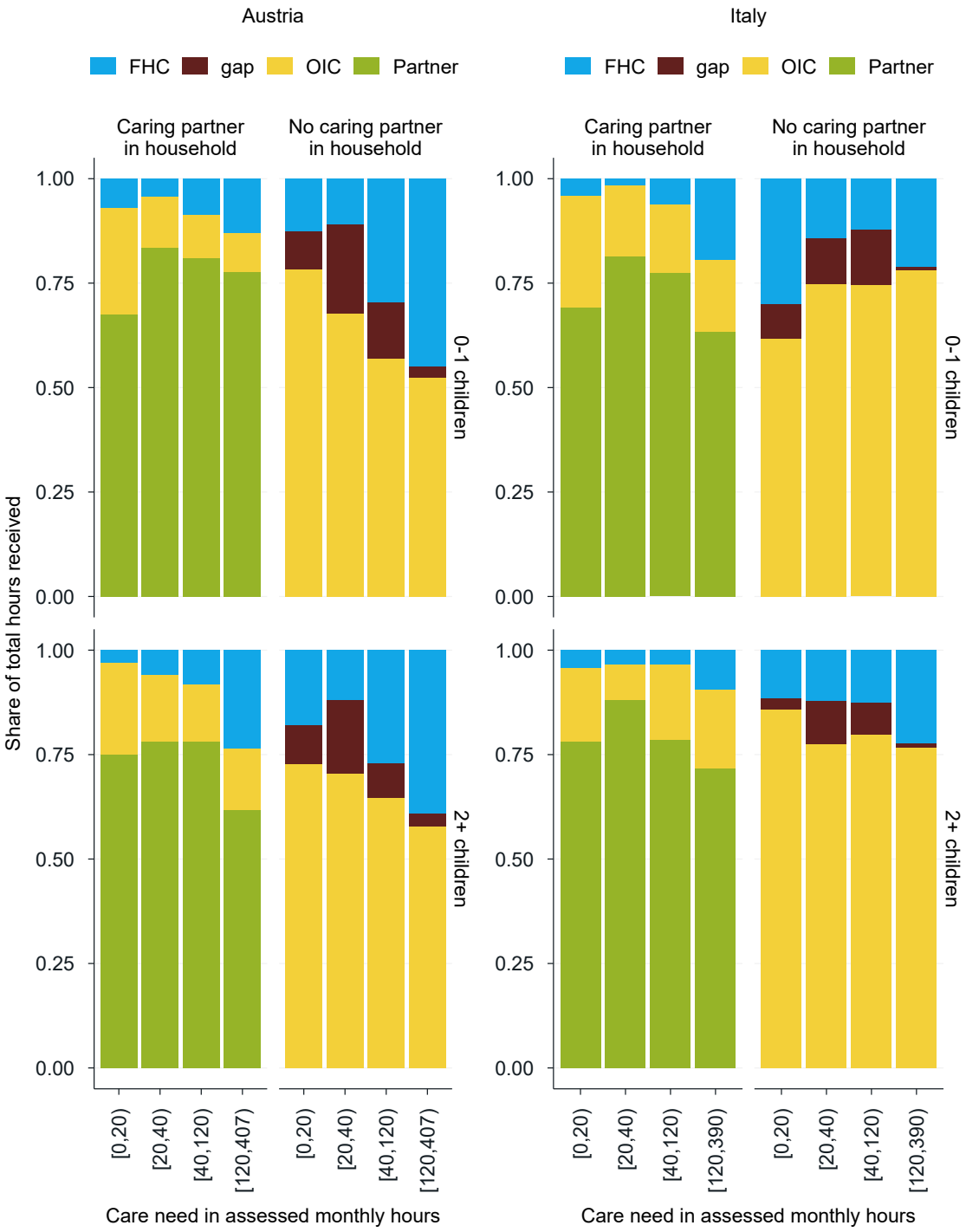

Fig. 14 Step 4 - Care mix in Austria and Italy by grouped assessed hours of care need, presence of a caring partner and the number of children. *Notes:* Subsample: respondents who receive home care. We report shares of total hours received by type of care and distinguish Formal Home Care (FHC), the care gap, Outside Informal Care (OIC) and care received from partners. Reproduced from Warum et al. (2025)

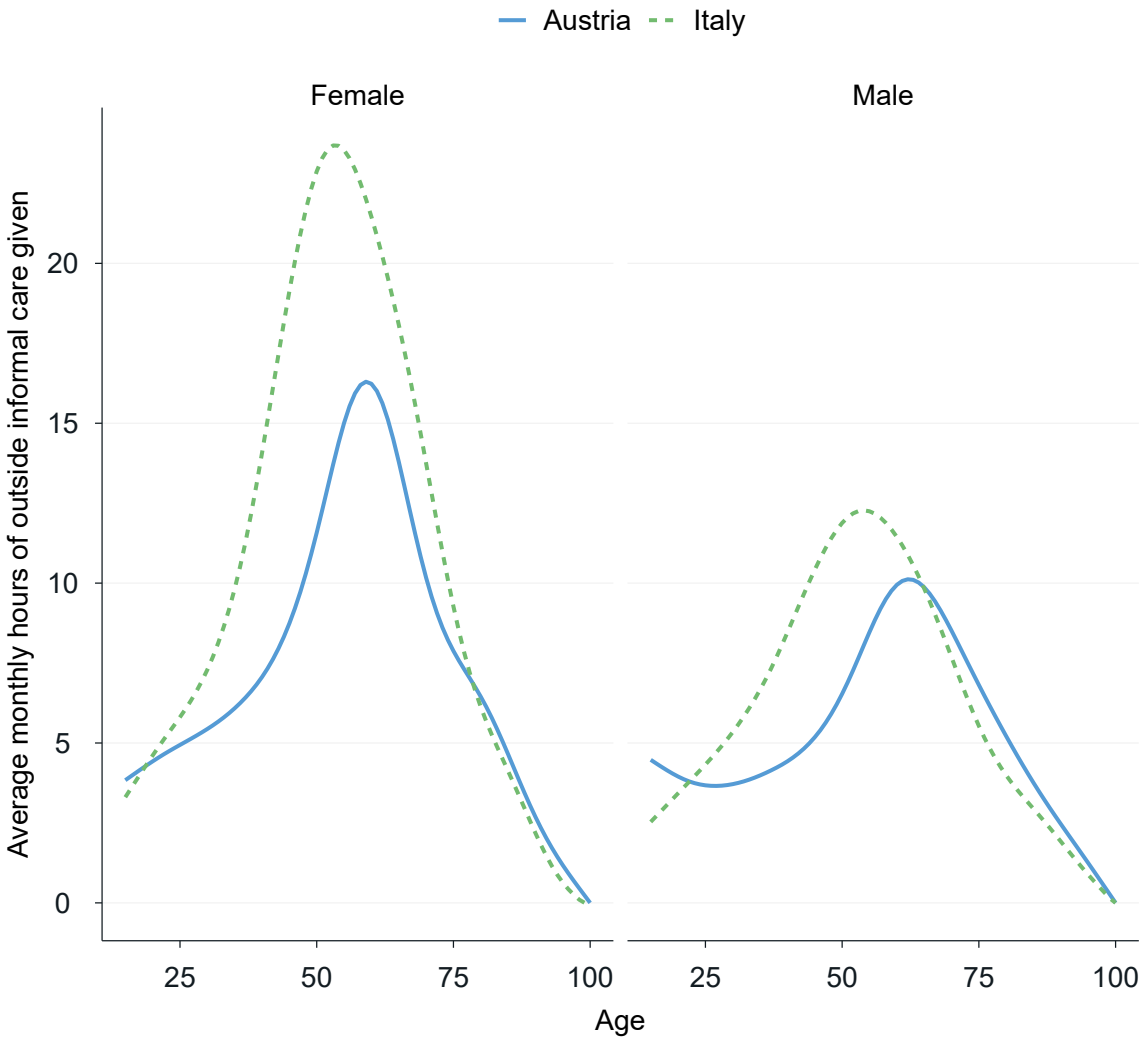

Fig. 15 Step 5 - Average hours of care given in Austria and Italy by age and sex. *Notes:* We combine data from SHARE for the 50+ population with data from EHIS for the population younger than 50 and apply statistical smoothing techniques. Reproduced from Warum et al. (2025)

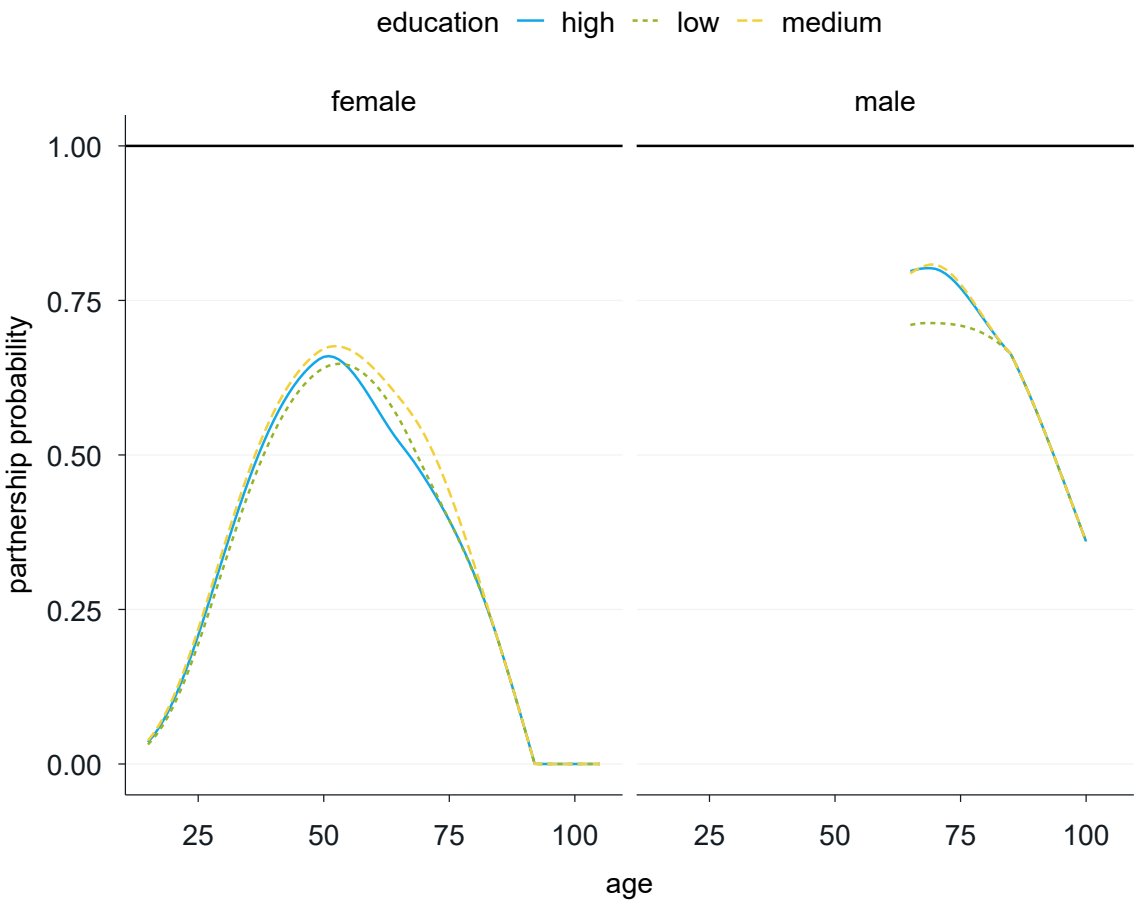

Fig. 16 Prevalence of having a partner in the household by age and sex for Austria. For women, EU-SILC data for below 65-year-olds is combined with SHARE data above age 65 and the parameter is estimated using smoothing techniques. Results for men are reported for illustration based on SHARE data only and not used as model parameter

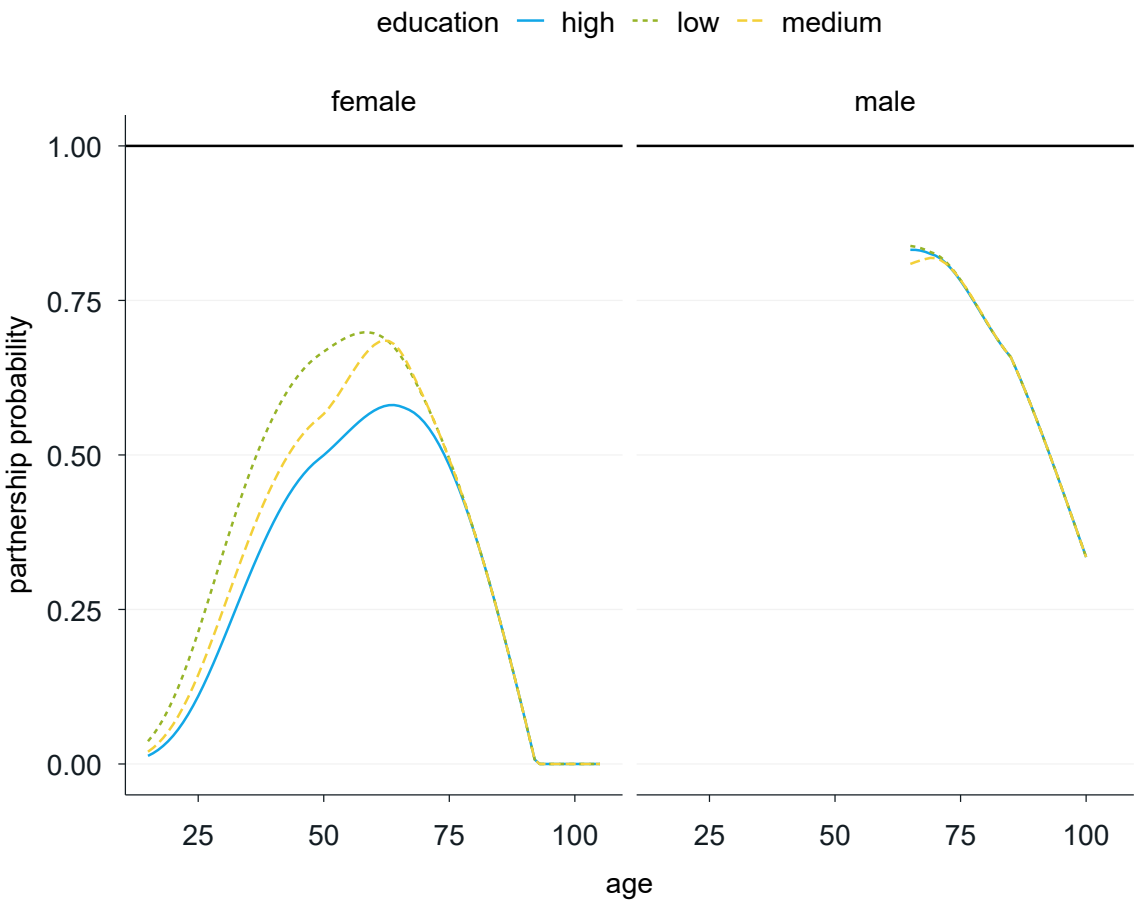

Fig. 17 Prevalence of having a partner in the household by age and sex for Italy. For women, EU-SILC data for below 65-year-olds is combined with SHARE data above age 65 and the parameter is estimated using smoothing techniques. Results for men are reported for illustration based on SHARE data only and not used as model parameter

A.2 Scenario S3: New union formation transition rates

The transition rates for new union formations for women aged 65+ vary between the two countries. In Austria, the rate is higher in the lowest age group [65,70) at 0.023, with slightly lower values in the higher age groups compared to Italy (0.015 [70,75) and 0.003 [75,80)). The rates are zero for higher ages in Austria. In Italy, the rate is 0.006 in age group [65,70), followed by 0.017 [70,75), 0.005 [75,80), 0.002 [80,85) and 0.002 [85,90). There are no union formations at higher ages.

A.3 Additional results

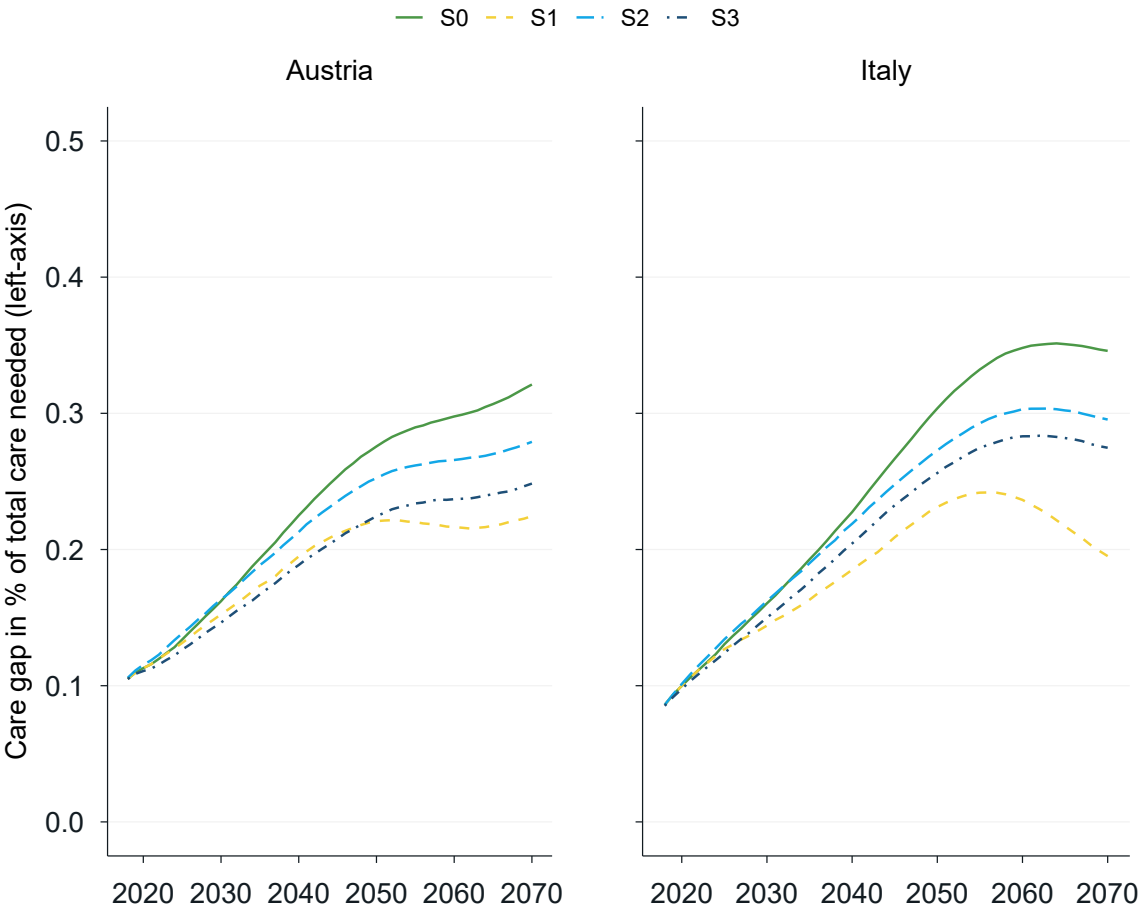

Fig. 18 Scenario comparison of projected changes the total care gap under the assumption that partners cover potential supply gaps

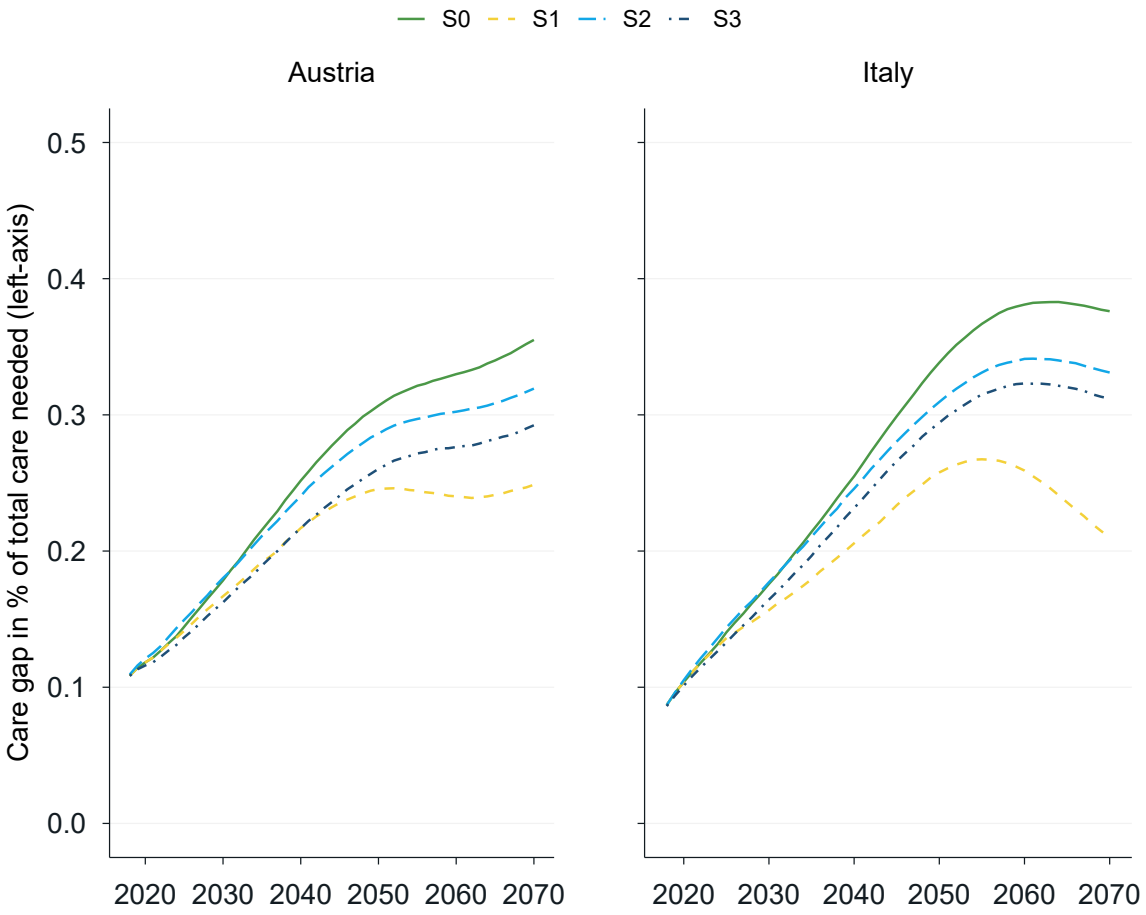

Fig. 19 Scenario comparison of projected changes the total care gap without the assumption that partners cover potential supply gaps

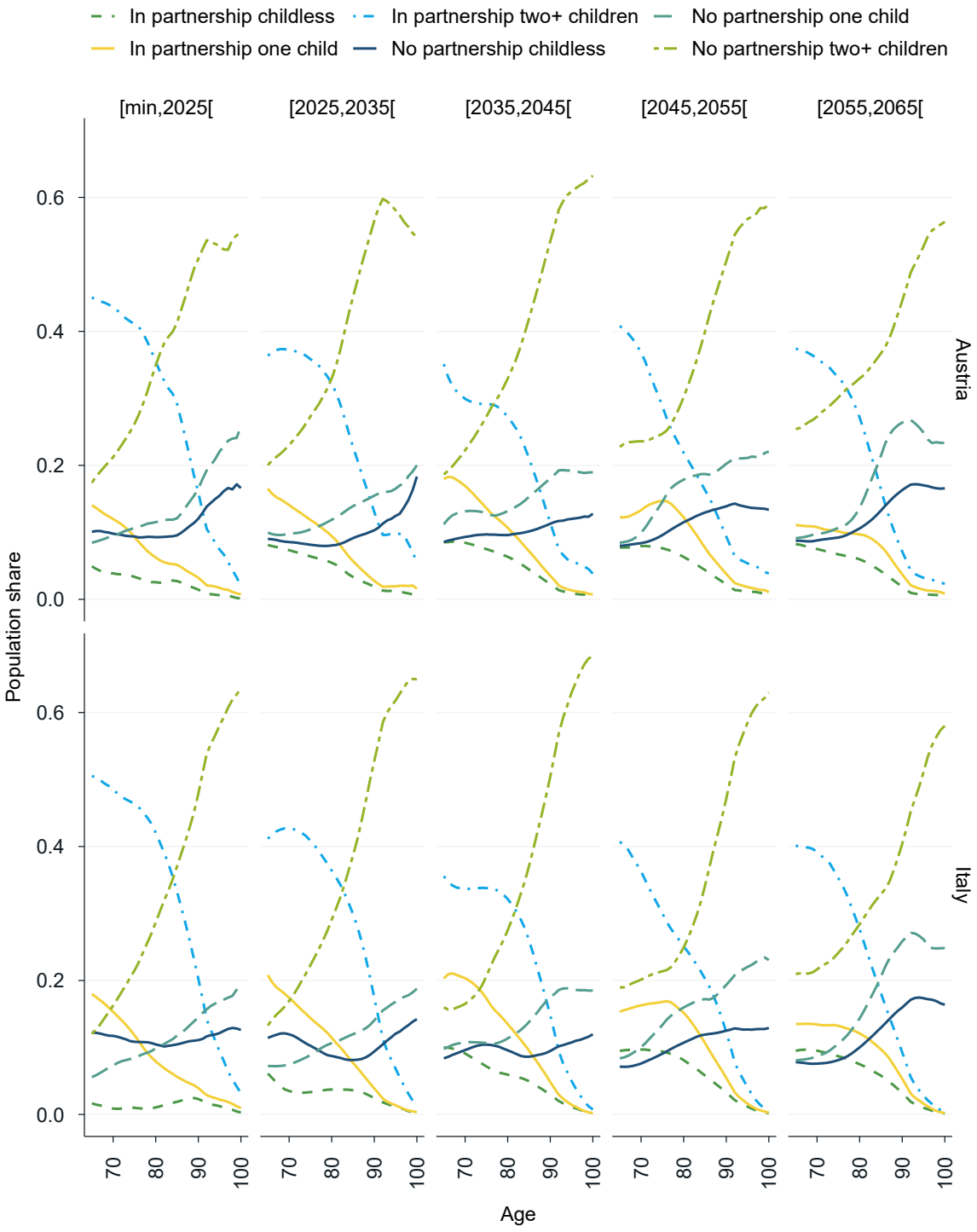

Fig. 20 Projected population shares by age, partnership status, number of children, decade and country in Scenario 0

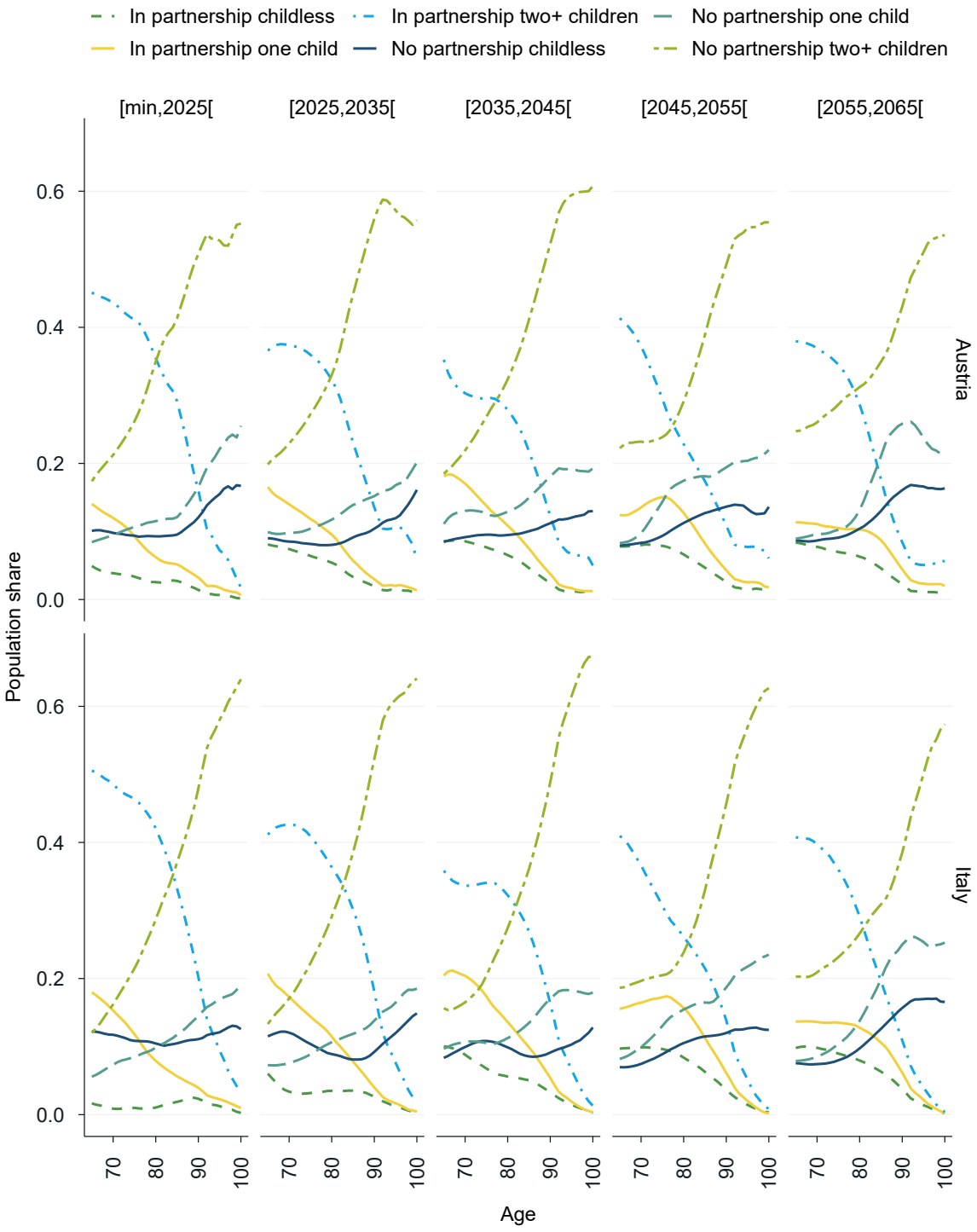

Fig. 21 Projected population shares by age, partnership status, number of children, decade and country in Scenario 1

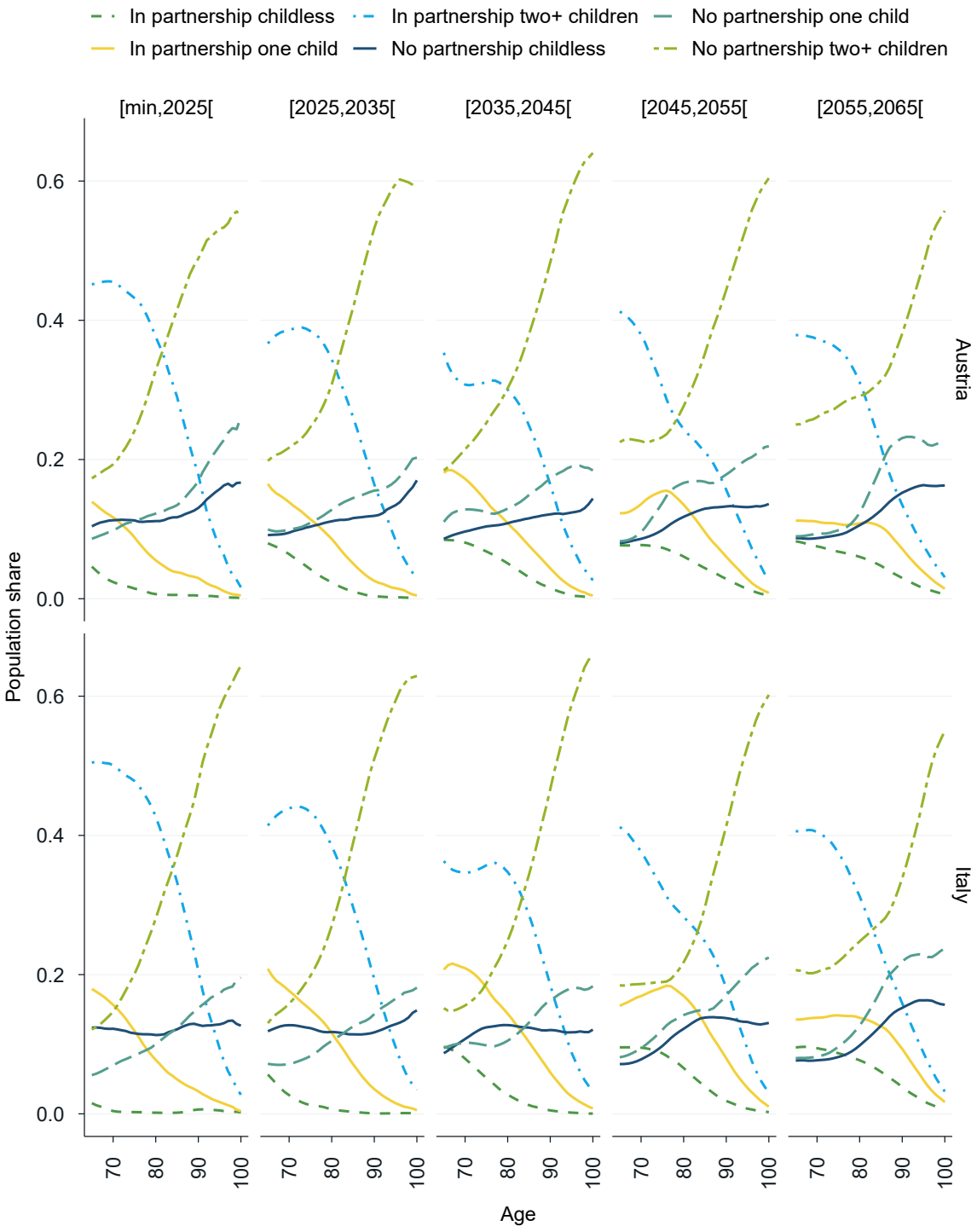

Fig. 22 Projected population shares by age, partnership status, number of children, decade and country in Scenario 2

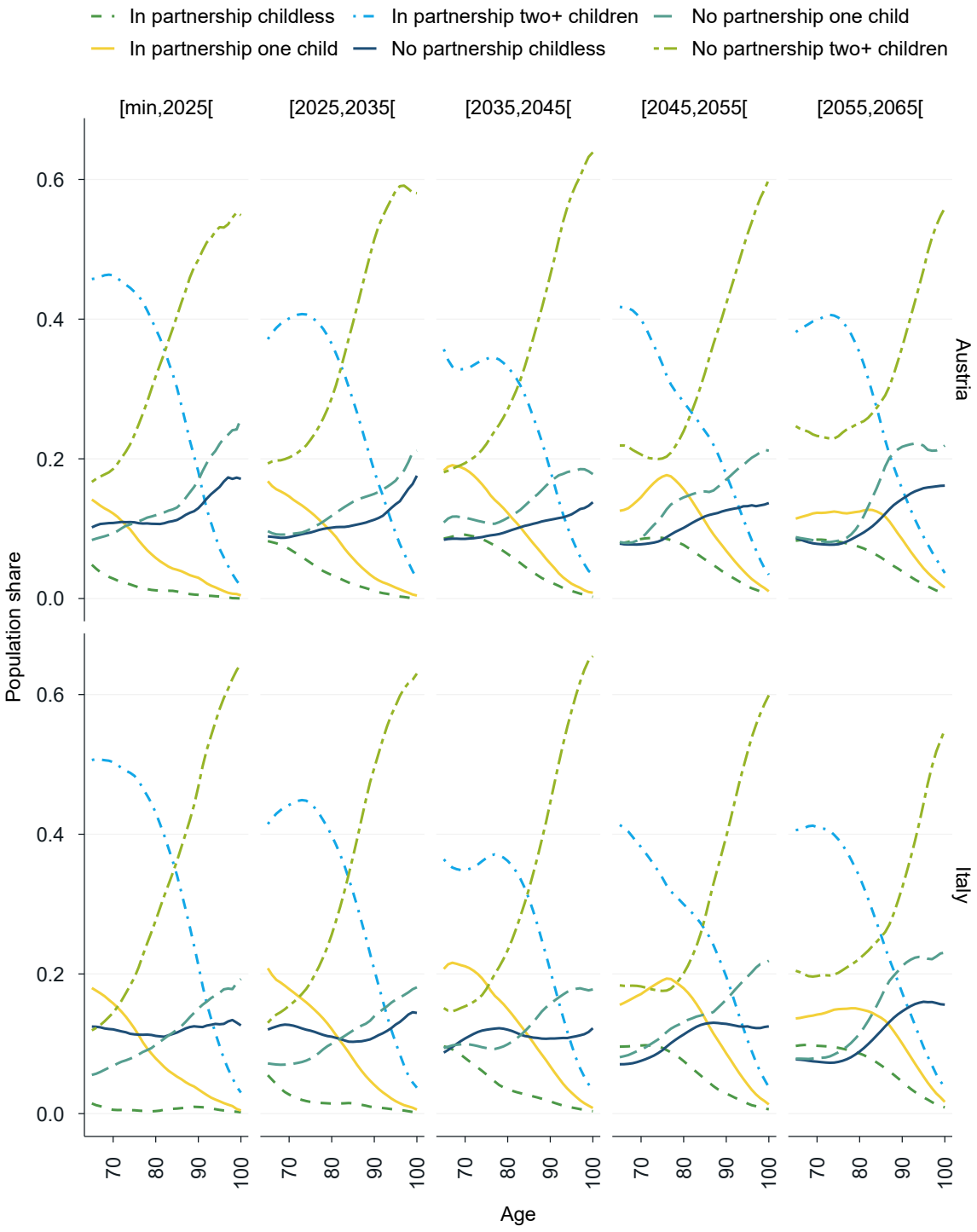

Fig. 23 Projected population shares by age, partnership status, number of children, decade and country in Scenario 3

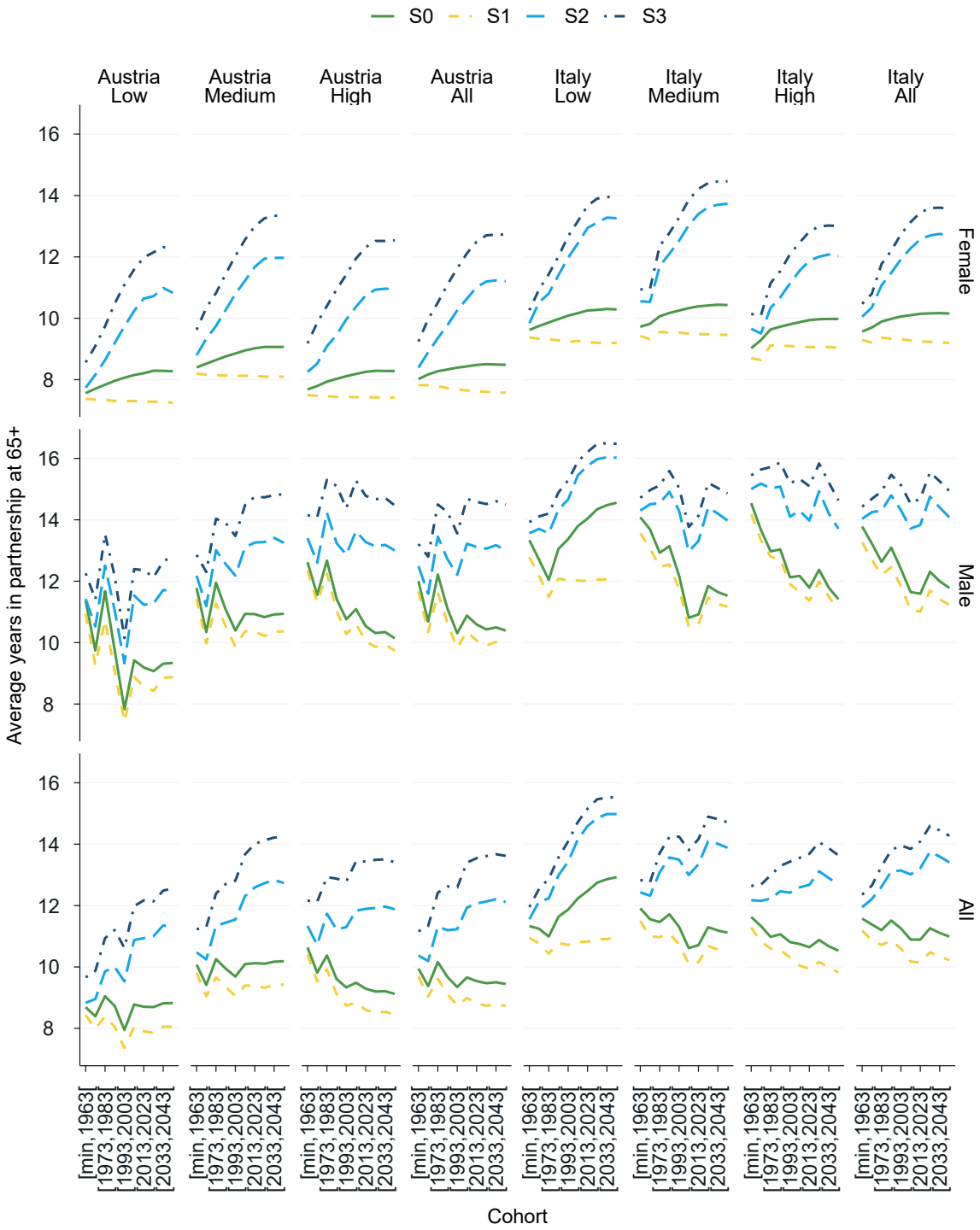

Fig. 24 Projected average years in partnership 65+ by cohort, sex and education in Austria and Italy

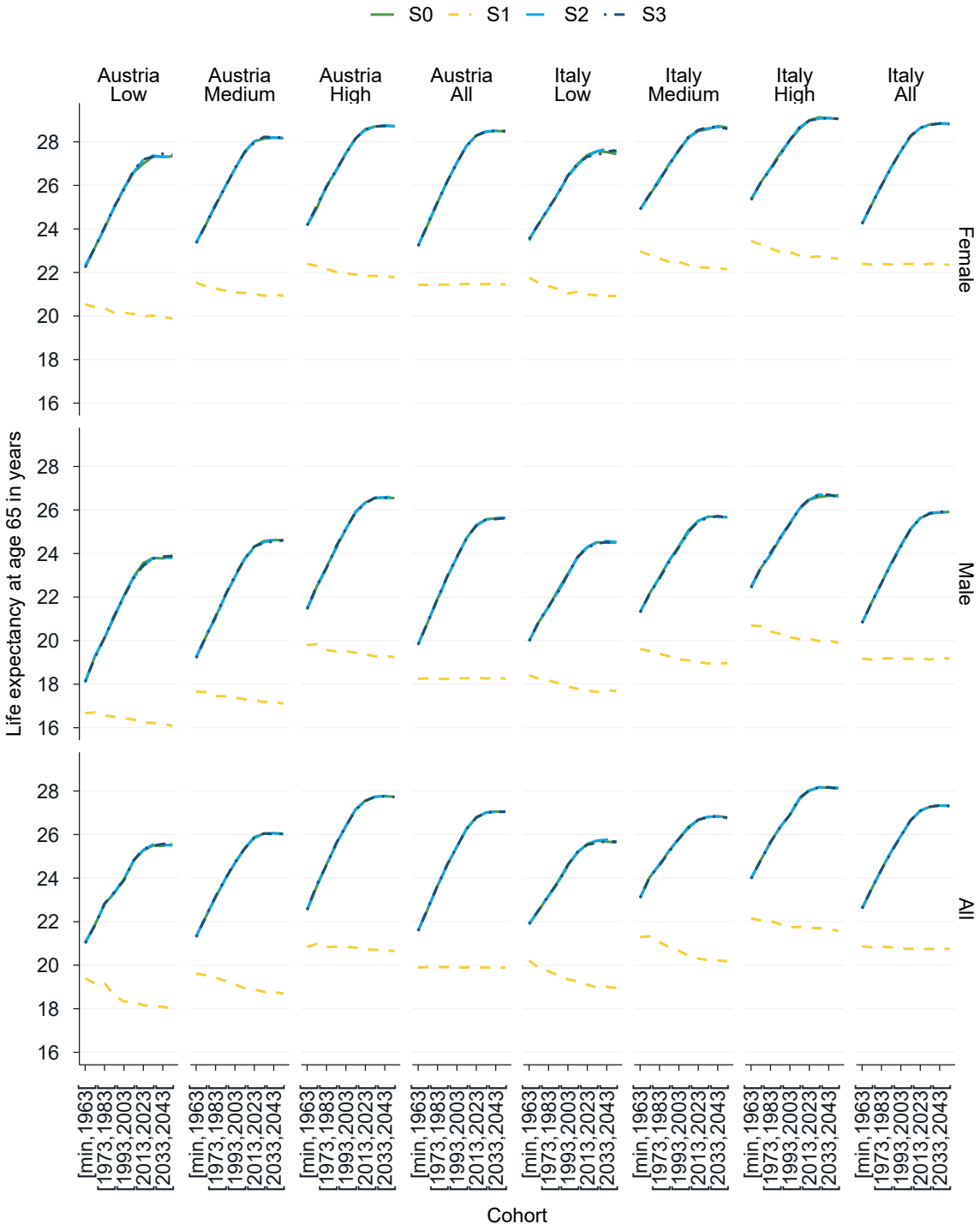

Fig. 25 Projected life expectancy at age 65 by cohort, sex, education in Austria and Italy

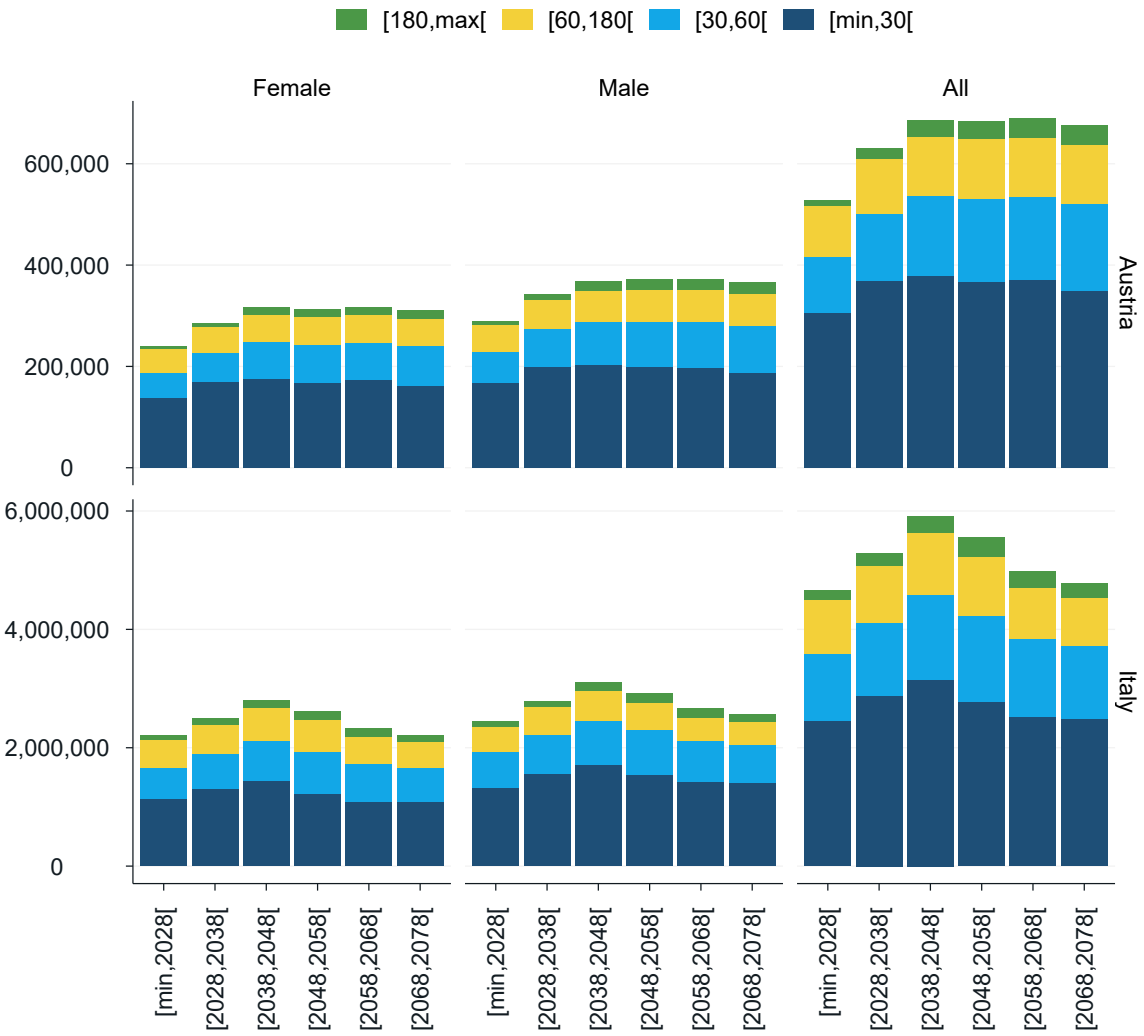

Fig. 26 Projected average distribution of care hours provided by partners by decade and sex in Austria and Italy. Scenario 0

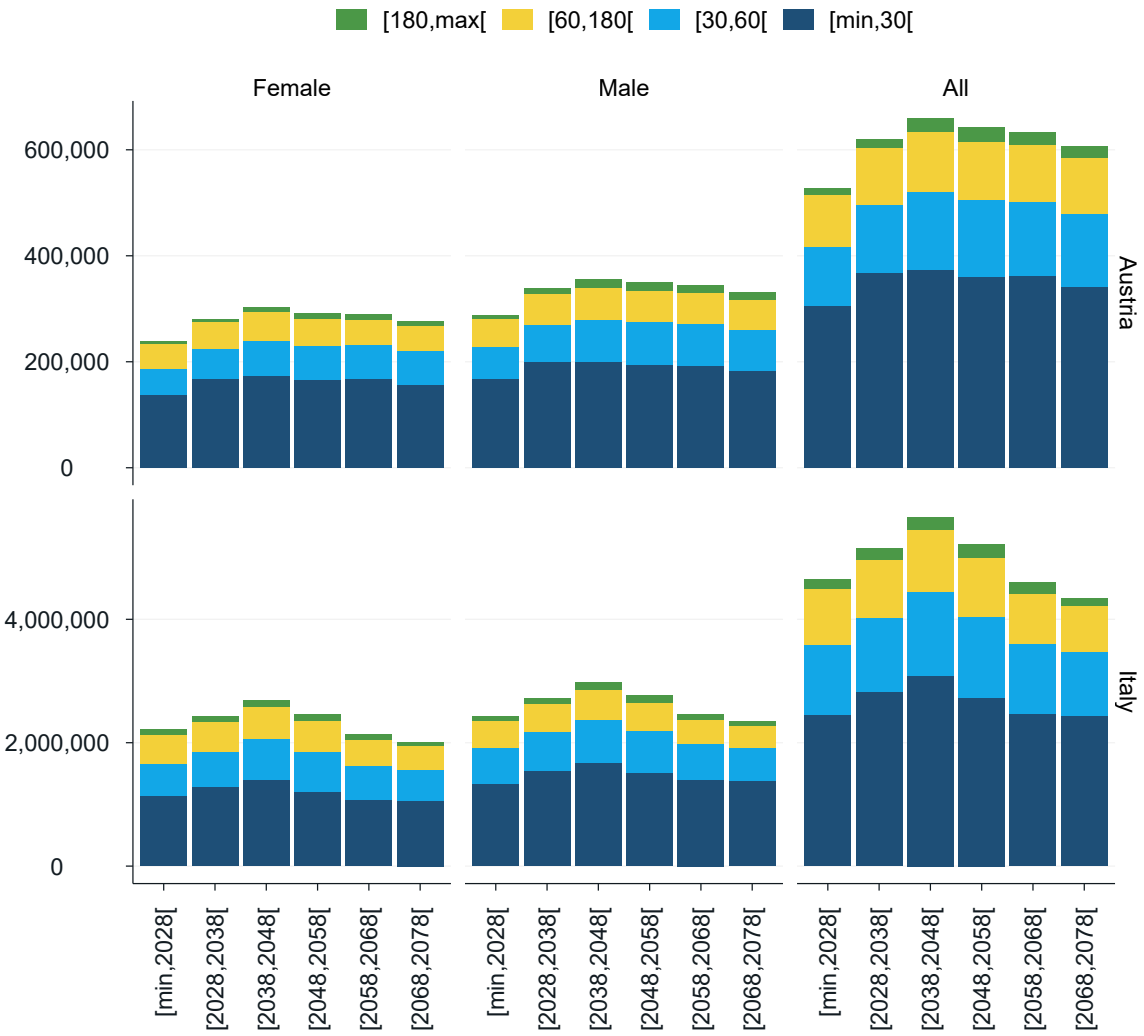

Fig. 27 Projected average distribution of care hours provided by partners by decade and sex in Austria and Italy. Scenario 1

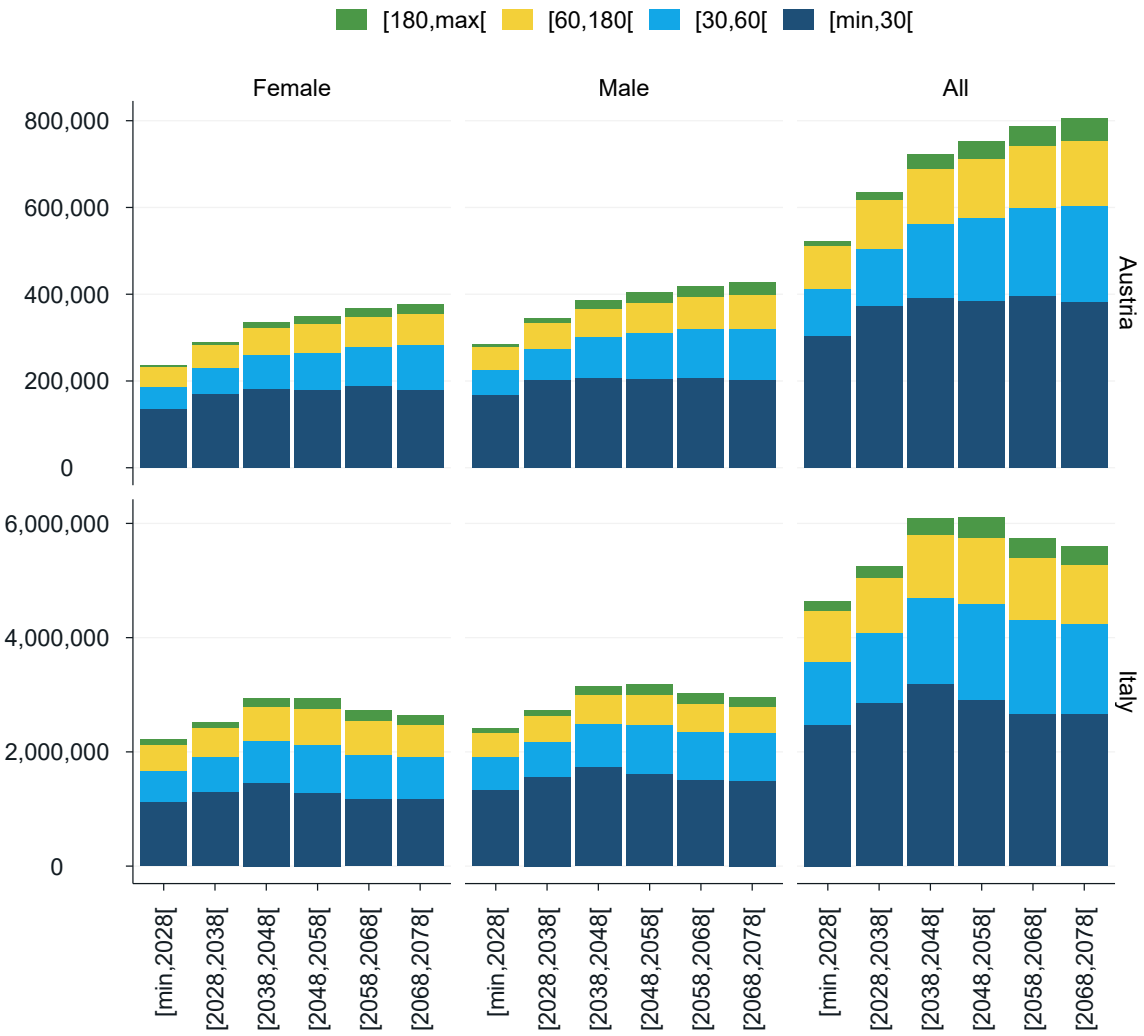

Fig. 28 Projected average distribution of care hours provided by partners by decade and sex in Austria and Italy. Scenario 2

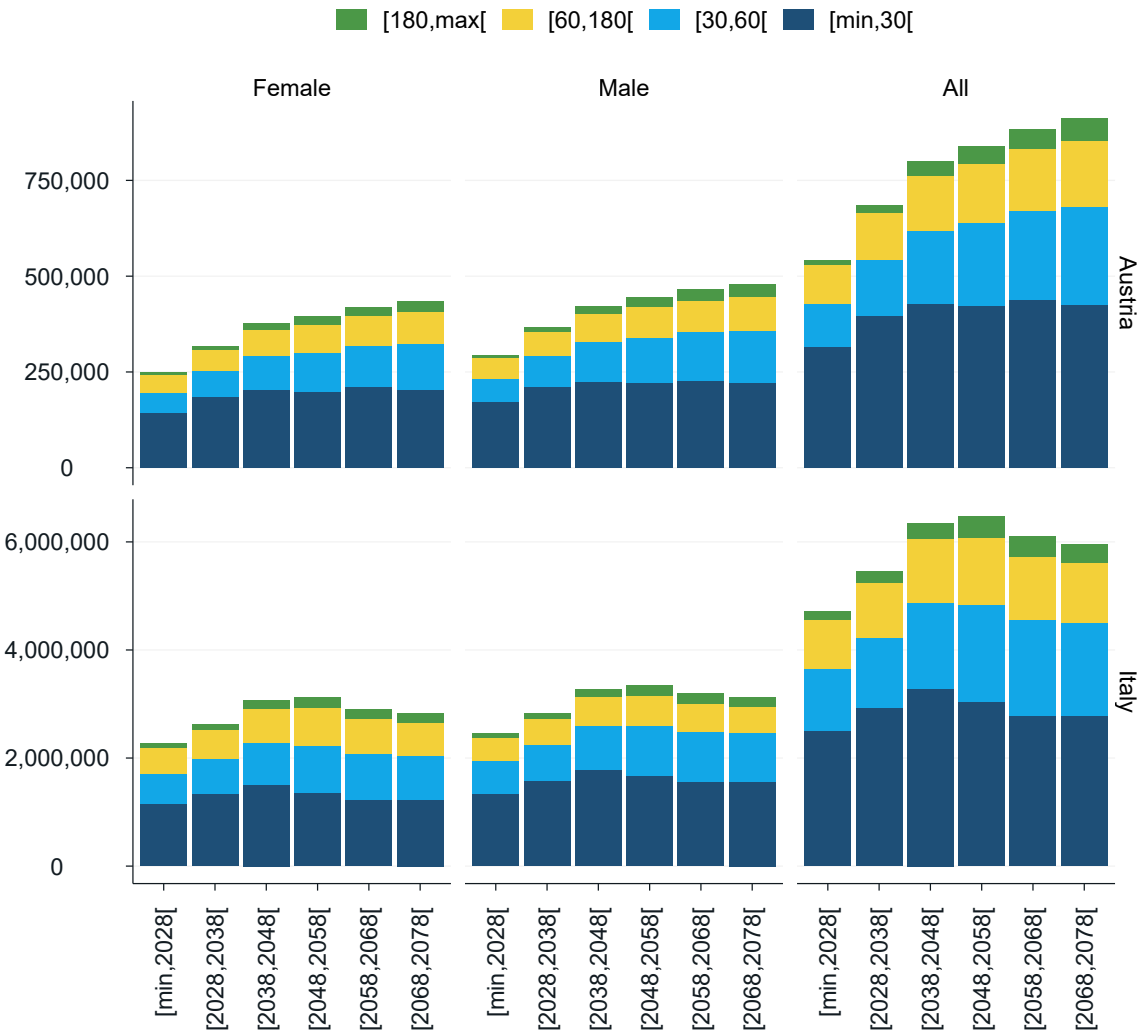

Fig. 29 Projected average distribution of care hours provided by partners by decade and sex in Austria and Italy. Scenario 3

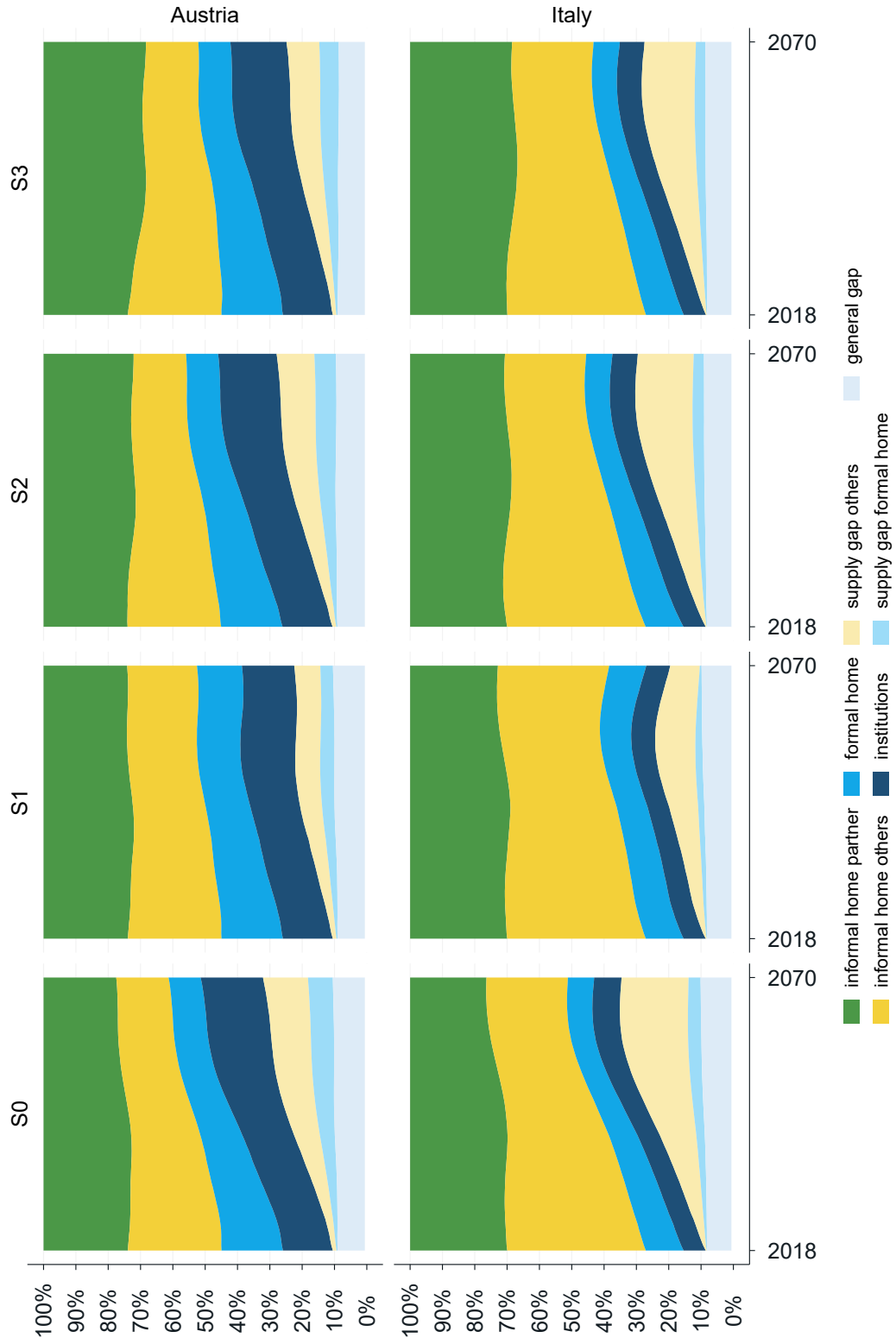

Fig. 30 Projected evolution of the care mix received in Austria and Italy. All Scenarios

A.4 Validation

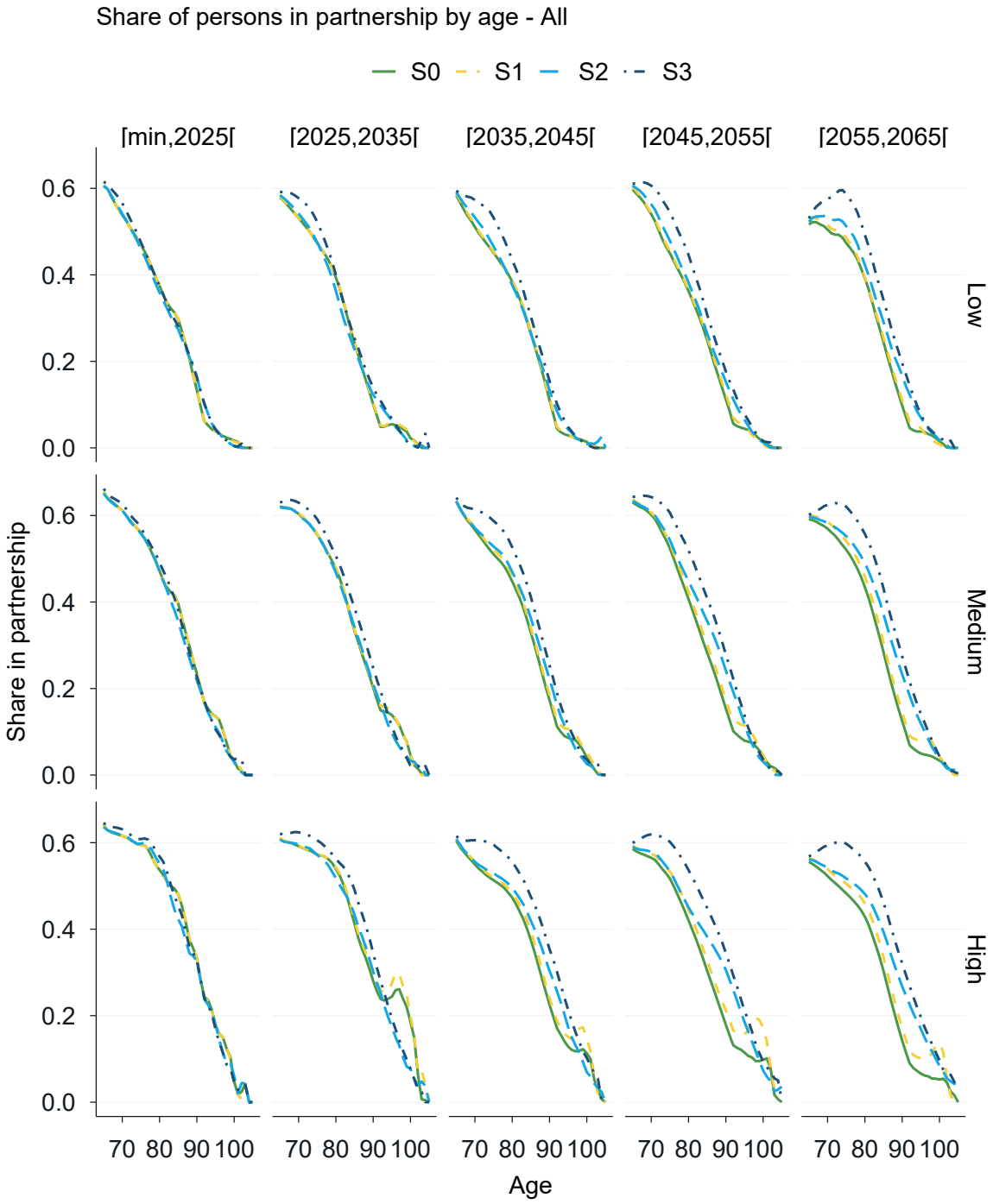

Fig. 31 Share of the Austrian population in partnership by age, education and decade

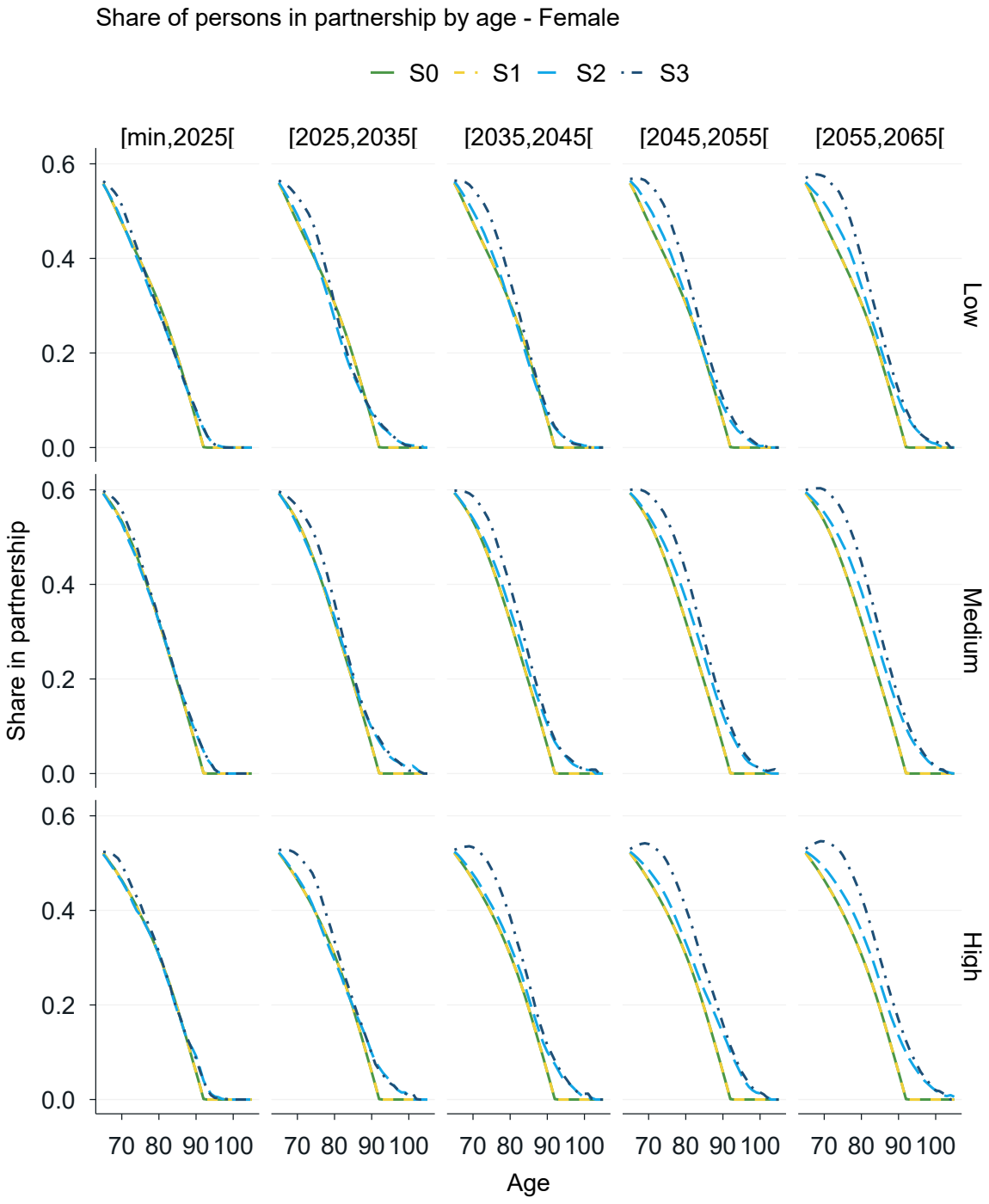

Fig. 32 Share of Austrian women in partnership by age, education and decade

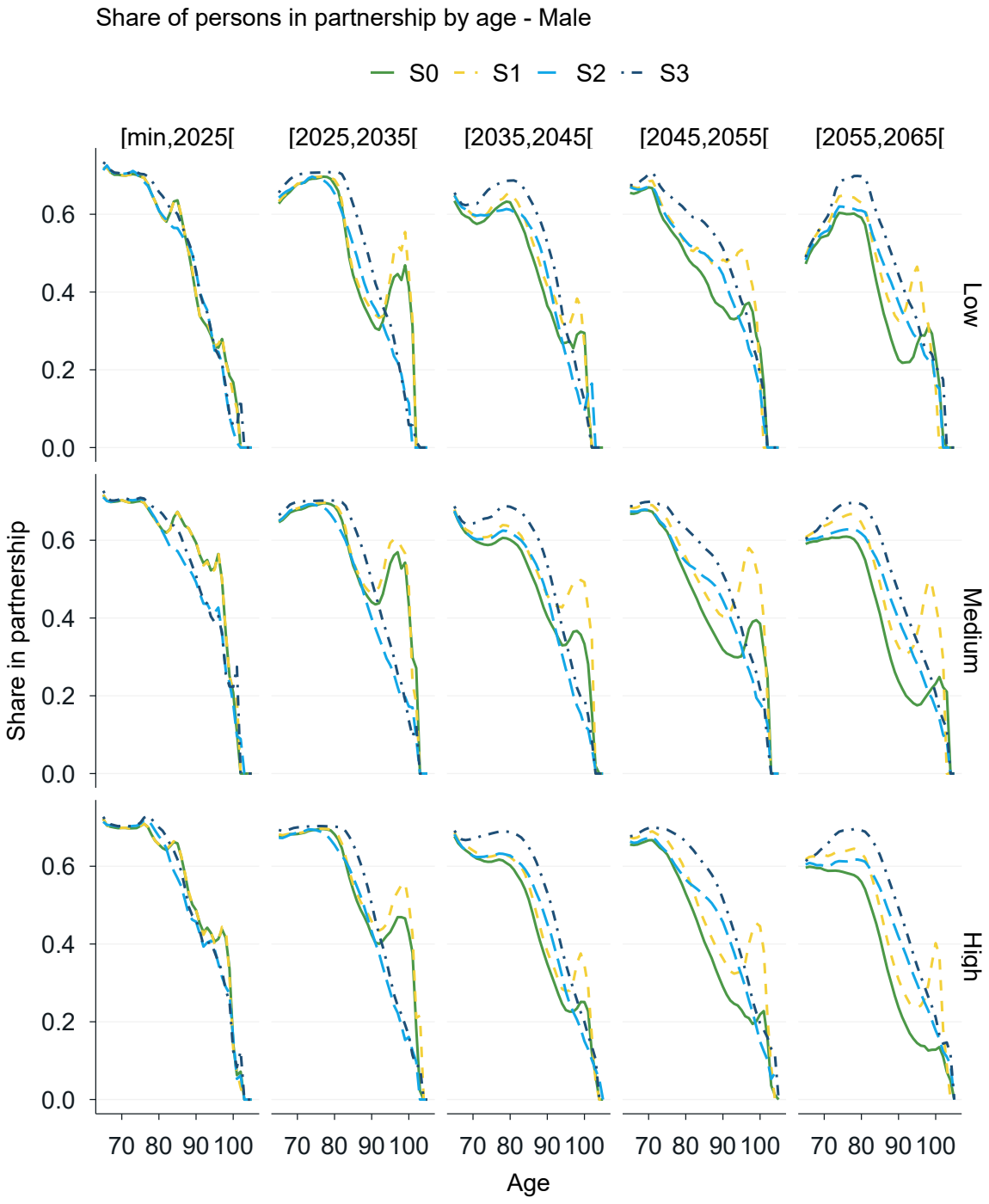

Fig. 33 Share of Austrian men in partnership by age, education and decade

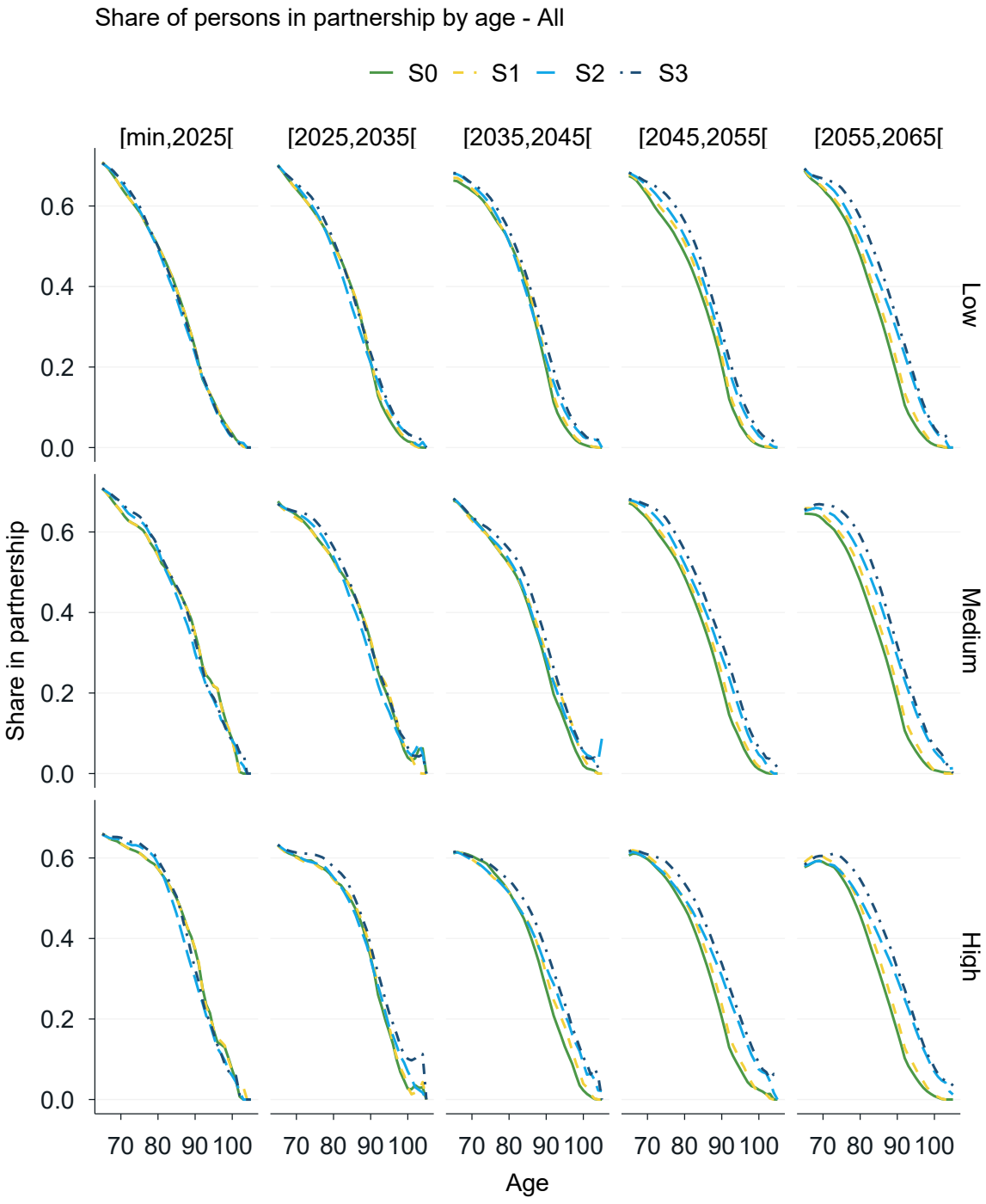

Fig. 34 Share of the Italian population in partnership by age, education and decade

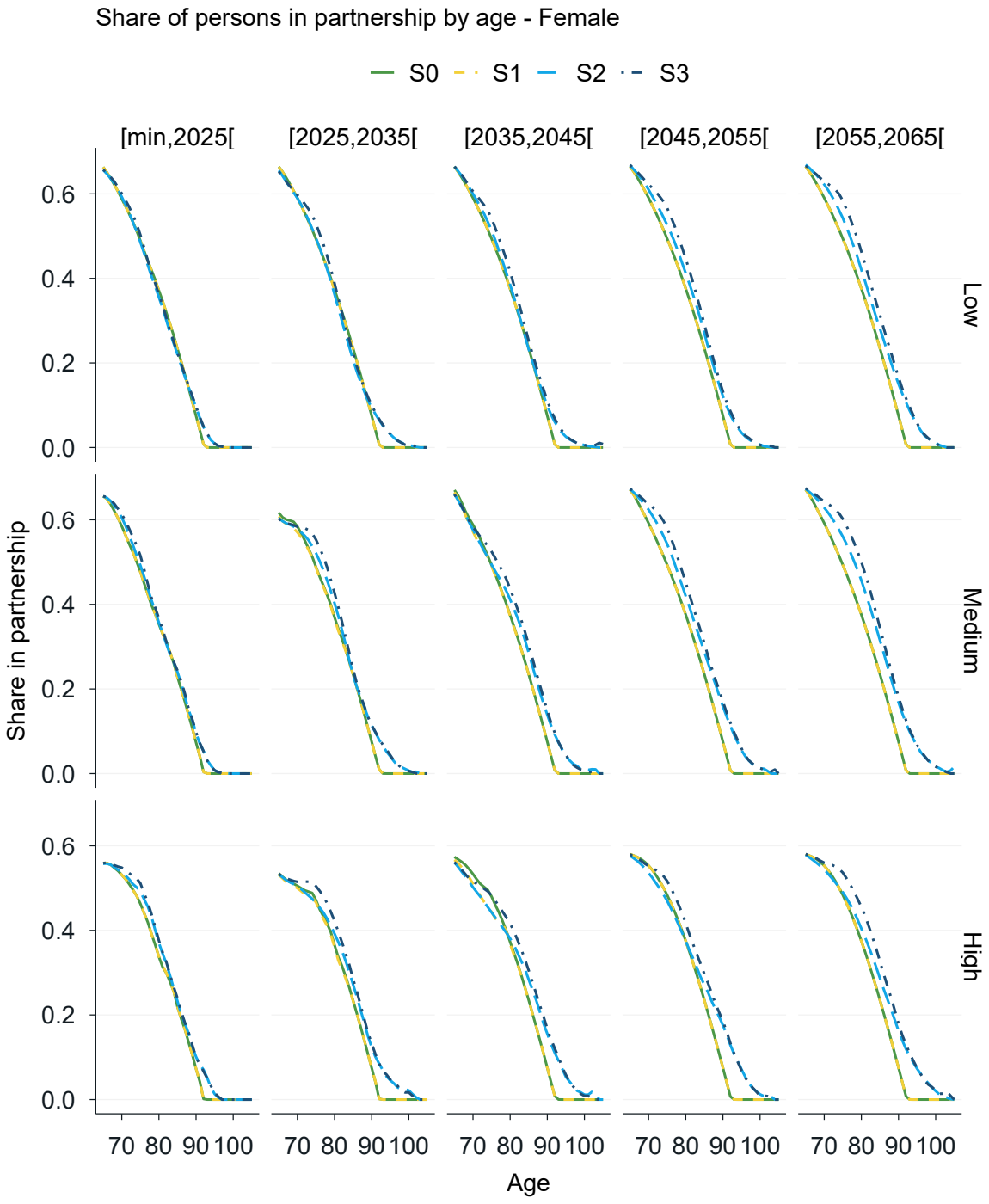

Fig. 35 Share of Italian women in partnership by age, education and decade

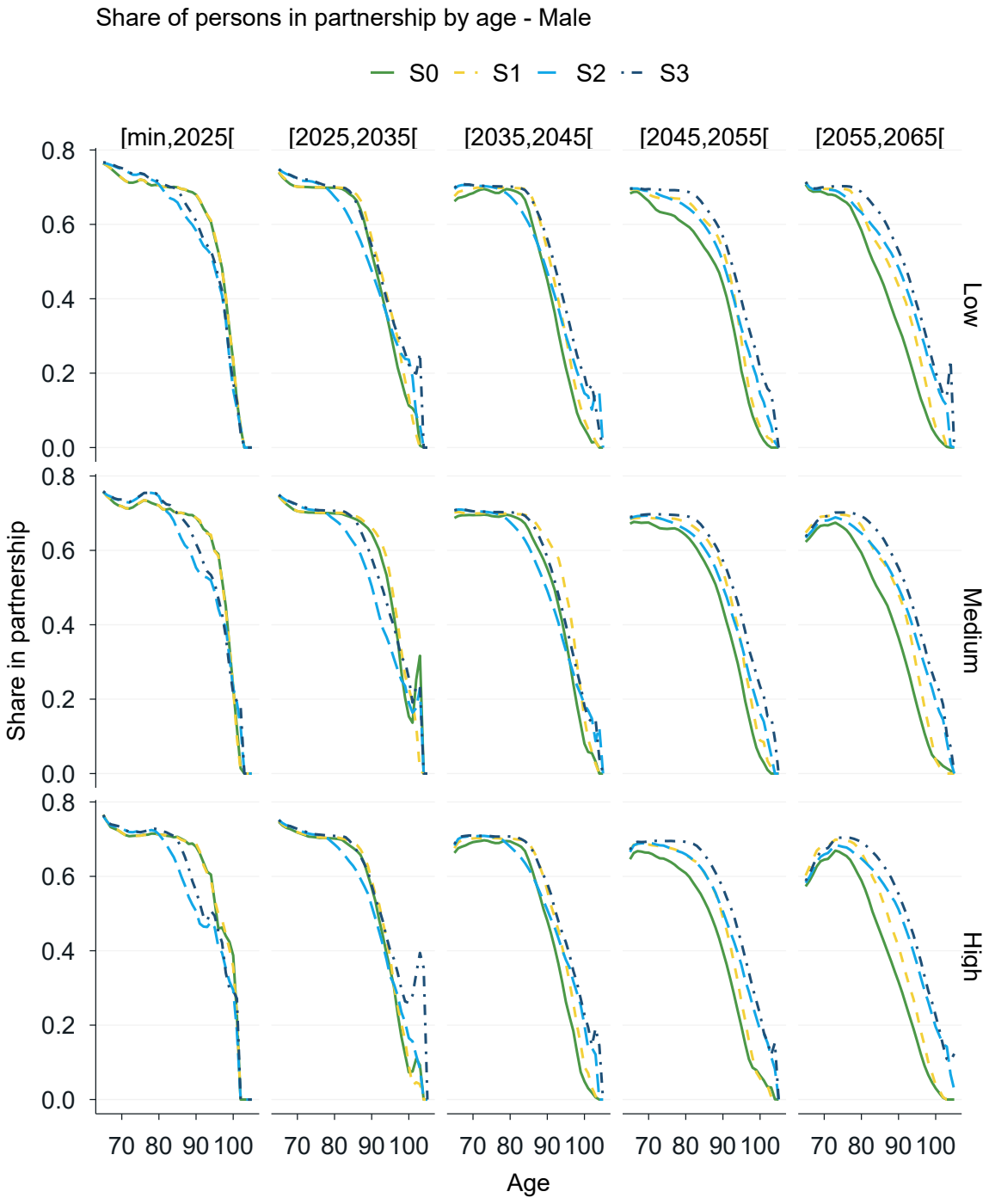

Fig. 36 Share of Italian men in partnership by age, education and decade

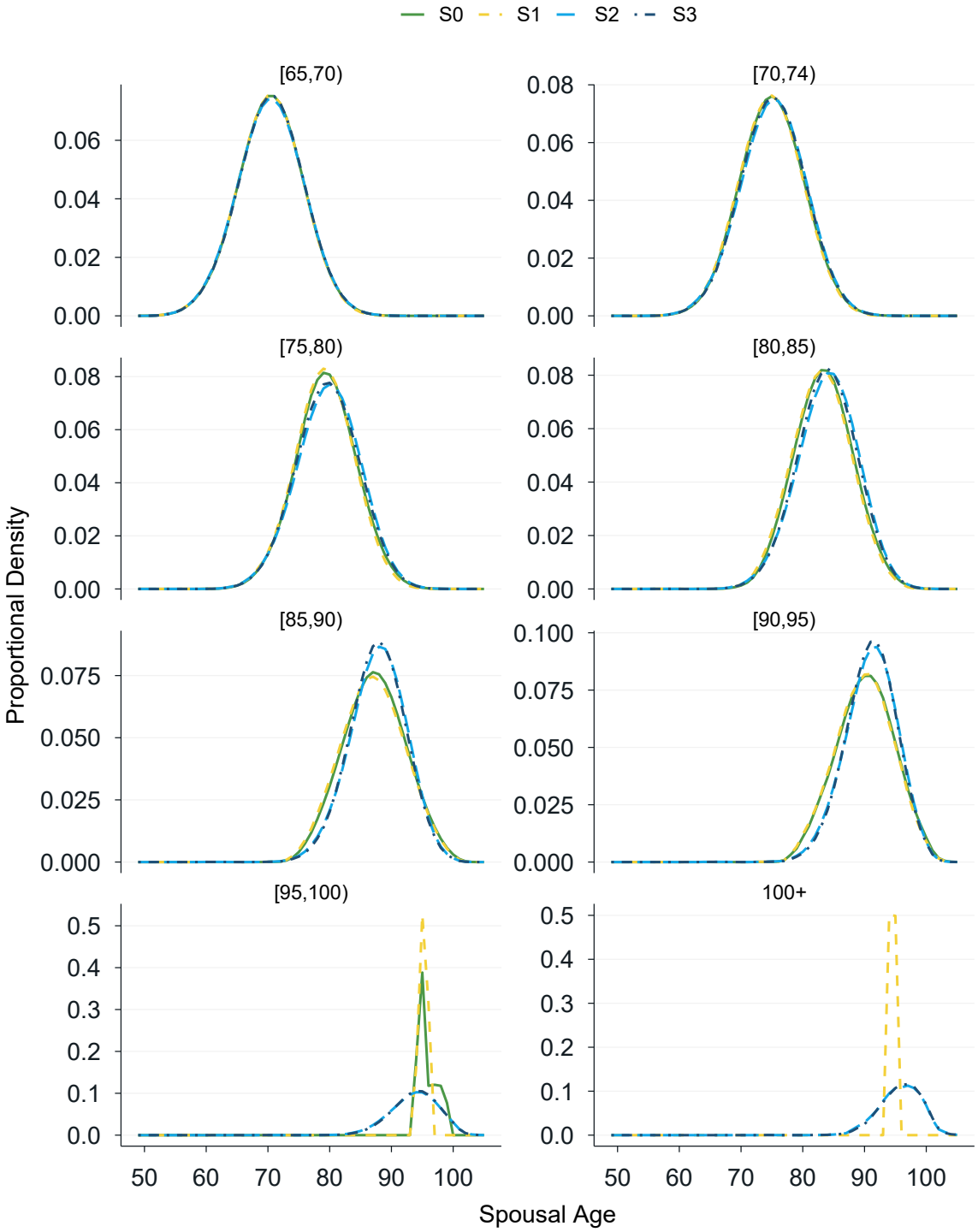

Fig. 37 Distribution of male spouse age by female spouse age group and scenario in Austria

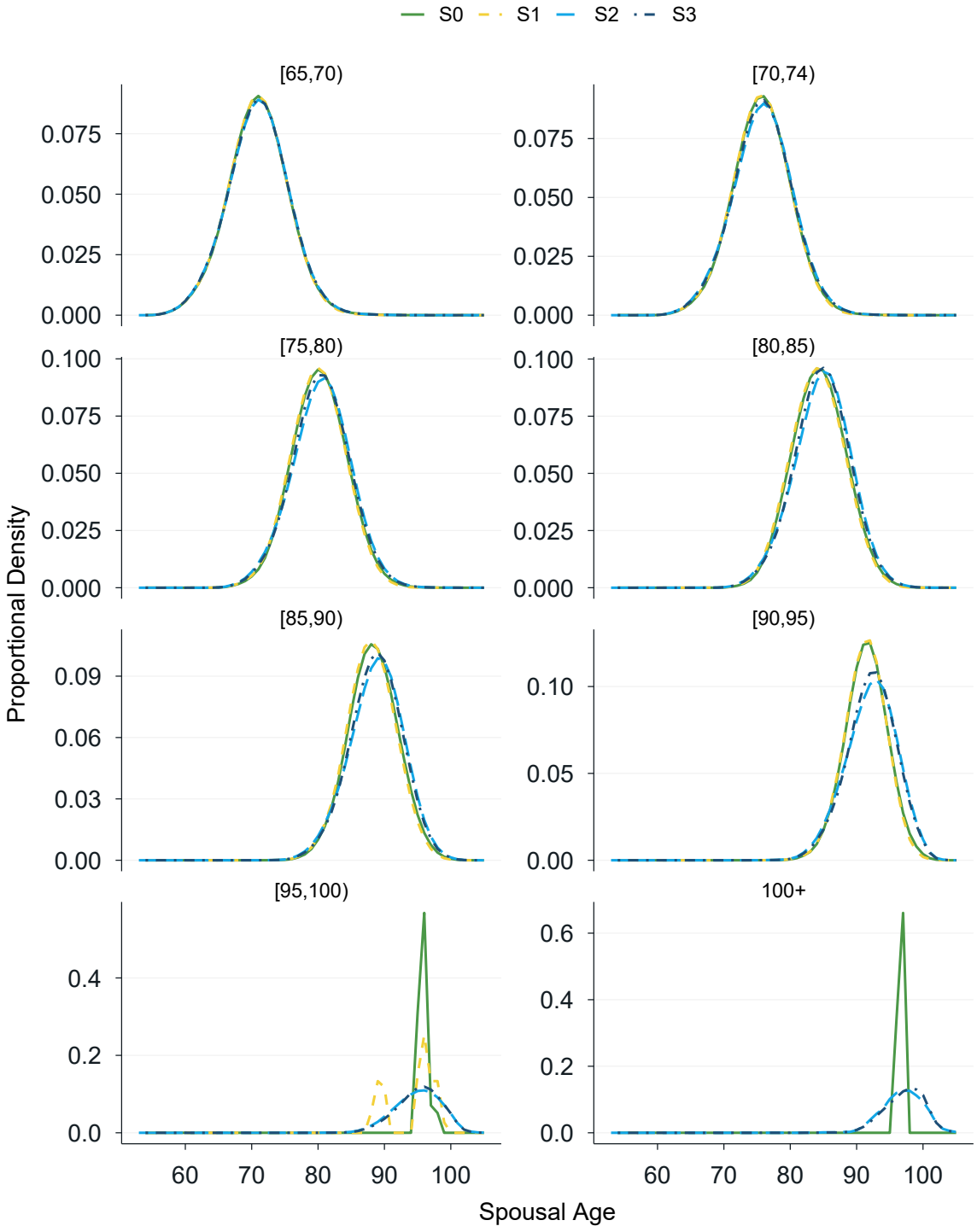

Fig. 38 Distribution of male spouse age by female spouse age group and scenario in Italy