Living arrangement decisions for elderly care in Italy

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Background

- The need to respond to the **raise** in the **demand for LTC** services is creating increasing concerns among citizens and policymakers in Italy
- Compared to the other OECD countries, the Italian population ranks among the oldest ones as a consequence of:
  - Very low fertility rate:
  - increased life expectancy.
- Most LTC is still provided by family caregivers, but households are less likely to be able to provide care directly in the future.
- **Several factors** contribute to **erode the potential of informal caregiving** within the family:
  - reduction in households' size
  - decline in family ties
  - increased women labour-force participation

Policy issues

- These trends are common to most developed countries and they raise concerns that are receiving increasing attention in the economic literature

- They involve important policy issues such as:
  - The assessment of the sustainability of current welfare systems;
  - The need to contain risks of "early" hospitalisation;
    - problems in ensuring appropriate and effective settings for caring activities;
  - Interplay between public action and private support (crowding out?);
  - substitutability/ complementarity between formal and informal care

The focus of the paper

•One of the areas of investigation concerns the determinants of **family decisions** regarding **living arrangements of elderly** people affected by limited autonomy or disabilities.

•**Main focus of our work is on** the role of **paid caregiving** when elderly people are assisted **at home**.

- •**Formal vs. Informal care** typically grounds on the assumption that formal care provided by paid helpers occurs exclusively when the elderly person resides in a living assisted facility.
- •i.e. in the traditional approach, informal and home care tend to coincide.

•**Claim**: when a dependent person is kept **at home**, the choice between informal and **paid care** is an **increasingly relevant issue.**

Brief outline of the literature

The **theoretical literature** varies along several dimensions:

- ✓ **common preferences** [Kotlikoff and Morris, *NBER* 1988; Hoerger et al., *Rev Econ Stat* 1996] or **family bargaining** [Stern, *J Hum Resour 1995*; Pezzin and Schone *Am Econ Rev* 1997; Engers and Stern, *Int Econ Rev* 2002];
- ✓ the **type of care** (formal or informal) or **living arrangements** considered (shared housing, live independently, nursing home), role of children in the decision process, etc.

- The **empirical literature** is as varied as the theoretical one.
- It has been conducted with a variety of econometric methods, but displays remarkably **consistent results**.
- The **majority** of **works** relates to the **United States** but a recent stream of research has developed also cross country **comparisons across Europe**.

The Italian context

- Since the late '80's Italy experienced significant **migration flows** from Eastern Europe and Africa, mostly undocumented and illegal, with a high female component that joined the **informal labour market**.
- Two third of these **women** are **engaged in domestic or personal care**.
- For many Italian families, the possibility to delegate home caregiving by buying assistance at a lower price with respect to professional services reduced significantly admission in nursing homes.
  - in most of cases affordability was achieved exploiting the black market;

Social norms about filial responsibility still tend to attach a consistent amount of **social stigma** to the institutionalisation of the elderly.

The Survey

- Data are drawn from a **cross-sectional survey** carried out in year 2002 on a representative sample of 1405 families of the Italian region Emilia Romagna (around 4 millions inhabitants).

- The main purpose of the questionnaire was to elicit **WTP** for covering **LTC expenditure risk**.
  - Public vs private insurance (Brau. Lippi Bruni PInna 2010, Applied Economics, Brau Lippi Bruni, 2008 Health Economics)

- For the present analysis we extract information from a specific section of the questionnaire devoted to register the presence of a **disabled person aged 50 or more** in the household (either co-resident or not).

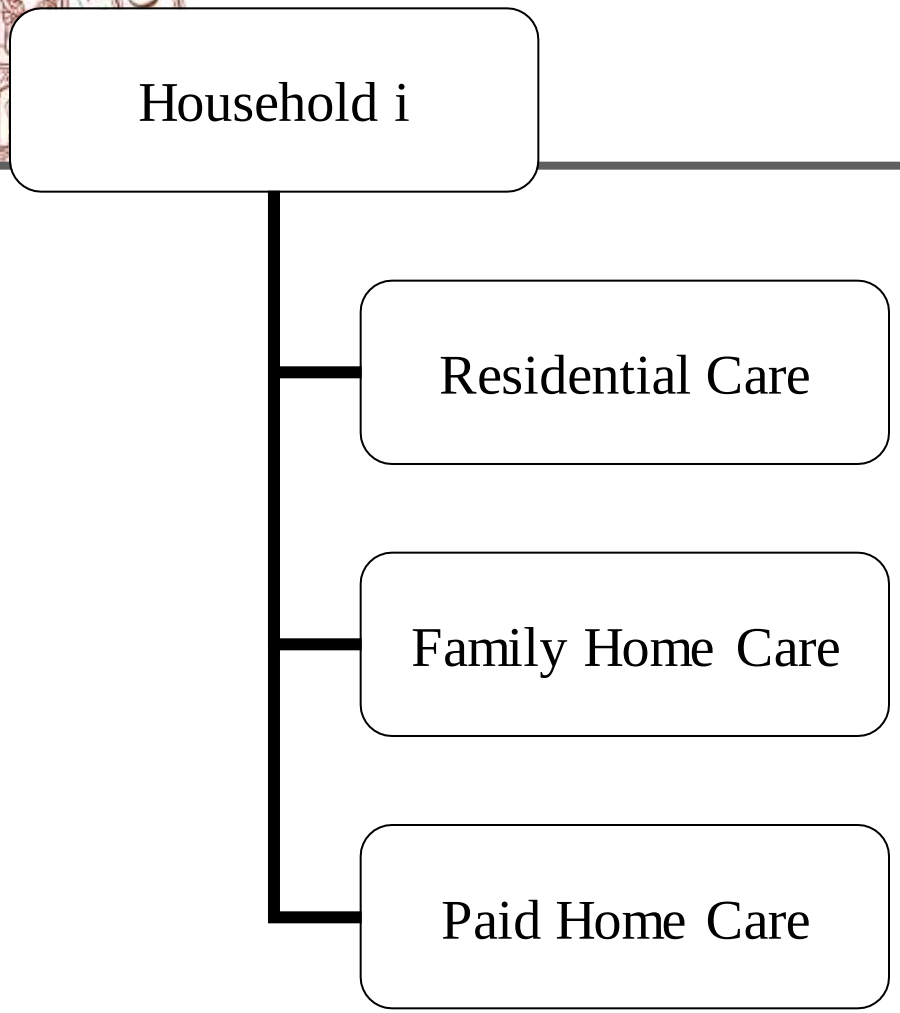
The choice model

- We assume **common preferences** among family members and living arrangement decisions taken **once-and-for-all**.

- We record a total of 279 households involved in the assistance of an elderly dependent,
  - 231 individuals live at home,
    - 179 receive informal home care,
    - 52 receive paid home care
  - 48 are institutionalised.

- The decision process of the household can be seen as:
  - simultaneous;
  - sequential:

THE DECISION TREE- Simultaneous decisions



The decision process can be seen as simultaneous.

The household has three alternatives:

1. to institutionalise the elderly in a living assisted facility (**Residential Care, RC**) ;
2. to provide care at home through informal family support (**Family Home Care, FHC**);
3. to hire an external caregiver to provide care at home (**Paid Home Care, PHC**).

THE DECISION TREE-
Simultaneous decisions

- According to the simultaneous decision scheme, each household faces three non-ordered alternatives.
  - For each alternative, indirect utility is composed by a deterministic component (xβ) and a stochastic error term ε. $U_{ij} = \beta_j X_i + \varepsilon_{ij}$
  - The underlying utility associated with each alternative is not observable but we can estimate the probability of choosing a given alternative by modelling choice process as follows: $P(d_{ij}) = \begin{cases} 1, \ if \ \ P(U_{ij} > U_{ik}), \ \ \forall k \neq j \\ 0, \ otherwise \end{cases}$
  - We exploit the observed choice of a specific living arrangement to estimate the set of relevant parameters β

$$d_{ij} = 1 \text{ if } \beta_1' X_i + \varepsilon_{i1} > (\beta_2' X_i + \varepsilon_{i2}, \beta_3' X_i + \varepsilon_{i3})$$
$$d_{ij} = 2 \text{ if } \beta_2' X_i + \varepsilon_{i2} > (\beta_1' X_i + \varepsilon_{i1}, \beta_3' X_i + \varepsilon_{i3})$$
$$d_{ij} = 3 \text{ if } \beta_3' X_i + \varepsilon_{i3} > (\beta_2' X_i + \varepsilon_{i2}, \beta_1' X_i + \varepsilon_{i1})$$

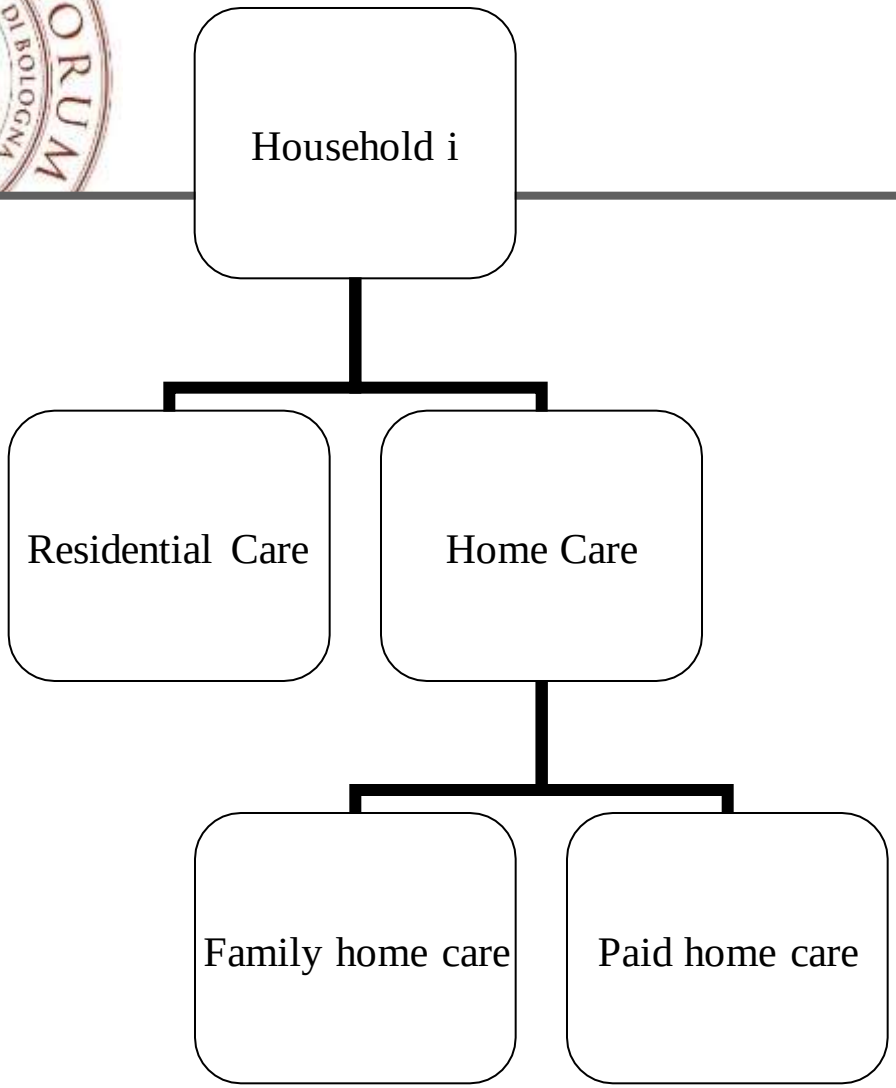
Multinomial Logit and IIA

- The **MultiNomial Logit (MNL**) specification is typically used to estimate the model previously described.
  - Its main limitation is that it relies on the IIA assumption for identification of the associated parameter vector.

- **IIA is potentially questionable** in this context, where two alternatives (family care and paid home care) display larger similarities compared to the third one (nursing home)

- We estimate also a **Multinomial Probit** specification, that, despite being computationally cumbersome, it allows to **relax the IIA assumption**
  - The var/cov matrix is no longer restricted to be diagonal

THE DECISION TREE – Sequential decisions



The decision process can be seen as articulated in two steps.

The household decides FIRST whether to institutionalise the elderly in a living assisted facility (**Residential Care, RC**) or to provide care at home (**Home Care, HC**).

For those who stay at home, the household decides whether to provide care directly (**Family home care, FHC**) or to hire a external caregiver (**paid home care, PHC**).

Biv-probit with sample selection

(e.g. van de Ven , van Pragg, 1981 *Journal of Econometrics*)

$$U_{ijt} = \beta_{jt} X_{it} + \varepsilon_{ijt}$$

i= 1….N t=1, 2

j = RC vs HC; PHC vs.IHC

1st Stage y_1=1 if *Home Care* ; y_1=0 if *Residential Care*

2nd Stage y_2=1 if *Paid H C*; y_2=0 if *Informal H C*

missing information if y_1=0

$$y_{i1}^{*} = (\beta_{HC1} - \beta_{RC1}) X_{i1} + (\varepsilon_{iHC1} - \varepsilon_{iRC1}) = \alpha_1 X_{i1} + v_{i1}$$

$$y_{i2}^{*} = (\beta_{PHC2} - \beta_{IHC2}) X_{i2} + (\varepsilon_{iPHC2} - \varepsilon_{iIHC2}) = \alpha_2 X_{i2} + v_{i2}$$

$$\sum_{y_{1i}=1,\ y_{2i}=1} \log \Phi_2[\alpha_1 x_{1i}, \alpha_2 x_{2i}, \rho] + \sum_{y_{1i}=1,\ y_{2i}=0} \log \Phi_2[\alpha_1 x_{1i}, -\alpha_2 x_{2i}, -\rho] + \sum_{y_{1i}=0} \log \Phi[-\alpha_1 x_{1i}]$$

The Data

DE characteristics

Age, Sex,

Lived alone	=1 if the DE lived alone before becoming disable;
LTC spell	Spell of disability in years
Num ADL	Number of ADLs and IADLs the DE is not able to perform
Meal	=1 if the DE is unable to prepare meals
Heavy help	=1 Public support for > 40 days (identification variable)

Family characteristics

House	=1 if the family owns the house
Household income	Household income in Euro (HH+ HH spouse, if present)
Eld_ratio	members >65 / total number of household members
Residence	=1 if the primary determinant of the residence choice was the will to live close to other members of the family (family ties)
Head_Age	Age of the head of the household
Head_Chronic	=1 if the head of the household suffers of chronic conditions

Multinomial probit /1

RESIDENTIAL CARE(vs.Paid HC)	Coef.	Std. Err.
Age DE	.0001	.0202
Sex DE	-.2936	.3939
LTC spell	.0229	.0154
Lived alone	.4825	.4026
Heavy help	1.0646	.5102**
Num ADL	.1622	.0737**
Cooking meals	1.0869	.5019**
HH Age	-.0267	.0166
HH Chronic	-.1915	.3962
Elderly ratio	.7429	1.0157
Family size	.0538	.1585
Family income	.0000	.0002
House ownership	-.4057	.4689
Town>25000	-1.9043	.6985***
Town<5000	1.4696	.7050**
Universal access	.1724	.4087
Need-based access	-.4375	.3622
Residence choice	-.4210	.4156
Cash care 1	.0864	.3777
Cash care 2	-.3257	.4499
Constant	-.0884	2.0265

Multinomial probit /2

INFORM H-CARE(vs.Paid HC)	Coef.	Std. Err.
Age DE	-.0449	.0164***
Sex DE	-.3675	.3363
LTC spell	-.0102	.0132
Lived alone	-.7915	.3465**
Heavy help	-.1431	.4884
Num ADL	-.0155	.0652
Cooking meals	-.6021	.3545*
HH Age	-.0148	.0147
HH chronic	-.6350	.3480*
Elderly ratio	1.4313	.7127**
Family size	.2523	.1424*
Family income	-.0006	.0002***
House ownership	.0586	.3784
Town>25000	-.0665	.4836
Town<5000	1.2429	.6189**
Universal access	-.9055	.3302***
Need-based access	.5725	.3127*
Residence choice	.9400	.3691**
Cash care 1	.3951	.3315
Cash care 2	-1.1399	.4435***
Constant	6.5933	1.5457***

Probit model with sample selection /1

HOME CARE(vs. RESID CARE)	Coef.	Std. Err.
Age DE	-.0236	.0127*
Sex DE	.2165	.2656
LTC spell	-.0248	.0084***
Lived alone	-.7946	.2951***
Heavy help	-1.0504	.2319***
Num ADL	-.1296	.0512**
Cooking meals	-1.1274	.3967***
Age HH	.0130	.0089
Chronic HH	.0634	.2797
Elderly ratio	.0398	.6019
Family size	.1201	.0980
Family income	-.0003	.0001**
House ownership	.3317	.2836
Town>25000	1.7060	.5975***
Town<5000	-.3677	.4494
Universal access	-.6607	.2898**
Need-based access	.6628	.2600**
Residence choice	.8983	.2849***
Cash care 1	.2354	.2352
Cash care 2	-.0267	.3319
Constant	3.6498	1.3513***

Probit model with sample selection /2

PAID H-CARE(vsINF CARE)	Coef.	Std. Err.
Age DE	.0313	.0117***
Sex DE	.2065	.2420
LTC spell	.0033	.0091
Lived alone	.4524	.2732*
Num ADL	-.0461	.0468
Cooking meals	.2580	.2505
Age HH	.0129	.0080
Chronic HH	.4729	.2441*
Elderly ratio	-1.1801	.5088**
Family size	-.1525	.0910*
Family income	.0004	.0001***
House ownership	-.0545	.2946
Town>25000	.1937	.3449
Town<5000	-7896	.4398*
Universal access	.6699	.2784**
Need-based access	-.3335	.2349
Residence choice	-.3914	.2447*
Cash care 1	-.1962	.0242
Cash care 2	.4745	.2834*
Constant	-4.7258	1.0866***

Econometric issues

SIMULTANEOUS MODEL

Although previous literature (e.g. Borsch-Supan et al. 1990) support the idea that home based solutions are more strongly correlated compared to residential care, there is no striking evidence against the IIA hypothesis (Hausman test).

- MNL and MNProbit specifications provide fairly similar results.

SEQUENTIAL MODEL

If H_0: $\rho=0$ Separate estimations generate unbiased coefficients

probit RC vs HC on the whole sample

probit PHC vs IHC on the subsample where y1=1

Our empirical evidence does not allow to reject the Independence hypothesis, but the result is not robust. Hence we find advisable to keep the joint model.

Empirical Results

- **Severity related variables** increase the probability of institutionalisation but have limited impact effect on the decision of hiring an external caregiver
- **Age** is an exception in that it influences the second but not the first stage decision
- **Lived Alone** increases the probability of hiring an external caregiver
- **Income** does not influence the choice between paid home care and residential care, but low income household are more likely to provide informal care.
- **Household composition** has limited influence on the decision process
- Poor health conditions of the **head of the household** increase the propensity to recur to external help.
- **Very frequent public support** captures extremely severe cases (highly institutionalised)
- **Strong family ties** increase the probability of choosing informal care.

Conclusions

- Assisting elderly dependent people by means of **formal care** is an **increasingly followed strategy** also when families opt for a **home care** solution.

- The **determinants** of formal care **differ substantially** if one considers **PHC vs FHC** instead of the more traditional choice between **RC vs HC.**

  Specific investigation of the issue is needed, in particular today that public policies strongly encourage home care and that the opportunity cost of informal care rises.

- **Residential care** becomes the preferred alternative when **health deteriorates, a** similar trend does **not** hold for **paid home care.**

- **Living arrangement decisions are strongly influenced by the economic motivations** (low income households more frequently opt for informal care).