Lecture 6: Long-term care for the elderly

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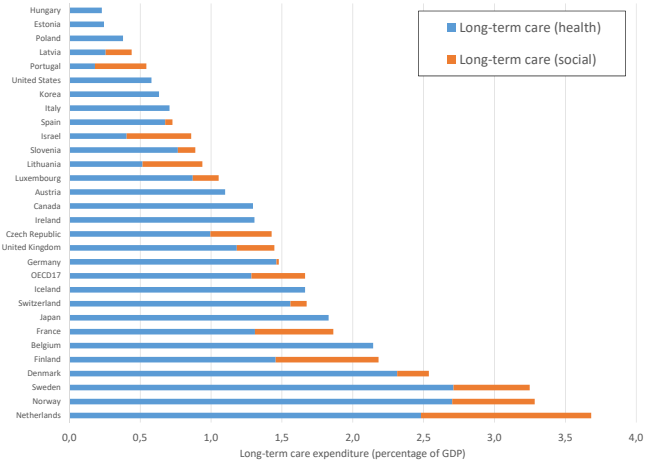
Research on long-term care

"Many issues about long-term care insurance and related public policy are not well understood. (...)
The "academic-papers-written-to-public-expenditures" ratio is far lower for long-term care than for the health sector as a whole."

Jeffrey Brown and Amy Finkelstein (JEP, 2011)

Figure 1 – Long-term care expenditure by government and compulsory insurance schemes (% GDP 2015)



Source : OECD *Health at A Glance 2017*, Fig. 11.24, p. 215.

Outline of the lecture

I. Measuring care needs

1. Measurement issues
2. Projecting care needs
3. Debates

II. Long-term care provisions

1. Informal care
2. Formal home care
3. Nursing homes
4. Ageing-in-place policies

III. Insuring long-term care risks

1. High uninsured risk
2. Why so little private insurance ?
3. Which design for public policies ?

I. Measuring care needs

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2. Projecting care needs
3. Debates

Conceptual models of disability

1. **Medical model**
   - disability is a feature of the person
   - disability is directly caused by disease, trauma or other health condition
   - disability requires medical care to ‘correct’ the problem with the individual

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   - disability is a feature of the person
   - disability is directly caused by disease, trauma or other health condition
   - disability requires medical care to 'correct' the problem with the individual
2. **Social model**
   - disability is not an attribute of an individual
   - disability is a socially created problem
   - disability demands a political response to modify an unaccommodating physical or social environment

Measuring incapacities

- **A functional approach**
  - Long-term care needs reflect incapacities to function in autonomy
  - This is not about diseases (medical assessment)

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  - Long-term care needs reflect incapacities to function in autonomy
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- **Functional models**
  - Saad Nagi (1965)
  - Handicap model (Fougeyrollas, *et al.* 1998)
  - General model (Philip Wood, 1975) led to WHO classification in 1980
  - New WHO classification in 2001

Measuring incapacities

- **Disablement process (Wood, 1975)**
  1. *Disease*
  2. *Impairment*
     - A loss or abnormality of psychological or anatomical structure or function
  3. *Disability*
     - Any restriction (resulting from impairment) of the ability to perform an activity in the manner considered normal for a human being
  4. *Handicap*
     - a disadvantage for a given individual, resulting from an impairment or a disability that limits or prevents the fulfillment of a role that is normal for that individual (in relation to age, sex, social and cultural factors)

Measuring incapacities

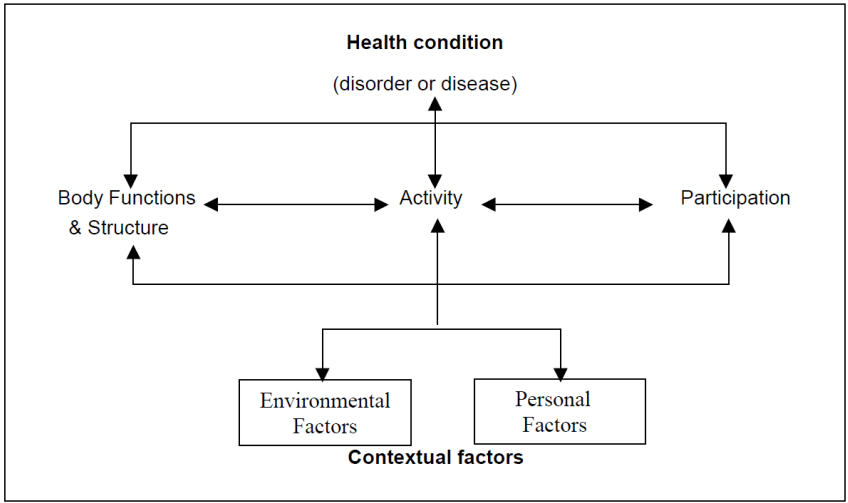
- **Conceptual changes**
  - Human Functioning, not only disability
  - Universal model, not only minority disabled

Measuring incapacities

- **Conceptual changes**
  - Human Functioning, not only disability
  - Universal model, not only minority disabled
- **International Classification of Functioning, Disability and Health (ICF)**

1. Body functions
2. Body structures
3. Functional limitations
4. Activity restriction
5. Participation

Figure 2 – Model of disability behind ICF (2001)



Source : WHO, International Classification of Functioning, Disability and Health, ICF (2001).

Measuring incapacities

- **Different scales**
  1. Activities of daily living (ADL)
  2. Instrumental activities of daily living (I-ADL)
  3. French scale AGGIR

Figure 3 – Katz scale of Activities of daily living (ADL)

BATHING Points: _____	**(1 POINT)** Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	**(0 POINTS)** Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing
DRESSING Points: _____	**(1 POINT)** Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	**(0 POINTS)** Needs help with dressing self or needs to be completely dressed.
TOILETING Points: _____	**(1 POINT)** Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	**(0 POINTS)** Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING Points: _____	**(1 POINT)** Moves in and out of bed or chair unassisted. Mechanical transfer aids are acceptable	**(0 POINTS)** Needs help in moving from bed to chair or requires a complete transfer.
CONTINENCE Points: _____	**(1 POINT)** Exercises complete self control over urination and defecation.	**(0 POINTS)** Is partially or totally incontinent of bowel or bladder
FEEDING Points: _____	**(1 POINT)** Gets food from plate into mouth without help. Preparation of food may be done by another person.	**(0 POINTS)** Needs partial or total help with feeding or requires parenteral feeding.

Figure 4 – Lawton-Brody scale of Instrumental activities of daily living (iADL)

A. Ability to Use Telephone		**E. Laundry**	
1. Operates telephone on own initiative-looks up and dials numbers, etc.	1	1. Does personal laundry completely	1
2. Dials a few well-known numbers	1	2. Launders small items-rinses stockings, etc.	1
3. Answers telephone but does not dial	1	3. All laundry must be done by others	0
4. Does not use telephone at all	0		
B. Shopping		**F. Mode of Transportation**	
1. Takes care of all shopping needs independently	1	1. Travels independently on public transportation or drives own car	1
2. Shops independently for small purchases	0	2. Arranges own travel via taxi, but does not otherwise use public transportation	1
3. Needs to be accompanied on any shopping trip	0	3. Travels on public transportation when accompanied by another	1
4. Completely unable to shop	0	4. Travel limited to taxi or automobile with assistance of another	0
		5. Does not travel at all	0
C. Food Preparation		**G. Responsibility for Own Medications**	
1. Plans, prepares and serves adequate meals independently	1	1. Is responsible for taking medication in correct dosages at correct time	1
2. Prepares adequate meals if supplied with ingredients	0	2. Takes responsibility if medication is prepared in advance in separate dosage	0
3. Heats, serves and prepares meals, or prepares meals, or prepares meals but does not maintain adequate diet	0	3. Is not capable of dispensing own medication	0
4. Needs to have meals prepared and served	0		
D. Housekeeping		**H. Ability to Handle Finances**	
1. Maintains house alone or with occasional assistance (e.g. "heavy work domestic help")	1	1. Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to bank), collects and keeps track of income	1
2. Performs light daily tasks such as dish washing, bed making	1	2. Manages day-to-day purchases, but needs help with banking, major purchases, etc.	1
3. Performs light daily tasks but cannot maintain acceptable level of cleanliness	1	3. Incapable of handling money	0
4. Needs help with all home maintenance tasks	1		
5. Does not participate in any housekeeping tasks	0		

Measuring incapacities

- **French scale AGGIR**
  - Scale "*autonomie, gérontologique, groupes iso-ressources*" (AGGIR)
  - Used by French administration to evaluate eligibility to elderly care benefit (APA)
  - Not used internationally, nor by academic research

Measuring incapacities

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- **Evaluation process**
  - For each activity, assessment whether individual can carry it alone fully, or partially, or not at all
  - 10 discriminating activities, 7 illustrative activities to provide information about the type of care needed
  - AGGIR scale of 6 GIR (*groupes iso-ressources*)

- **10 discriminating activities AGGIR scale**
  1. Verbal communication
  2. Spatial and time localisation
  3. To bath oneself
  4. To dress/undress oneself
  5. To eat
  6. To go to the toilets
  7. To stand, sit and lay down
  8. To move around one's home
  9. To move outside home
  10. To use communication means to call for help

Table 1 – AGGIR scale

GIR	Description
GIR 1	Person who cannot move out of bed with severely altered mental health Person in end of life
GIR 2	Person who cannot move out of bed but with mental functions not fully impaired Person who can move alone but with severely altered mental impairments
GIR 3	Person with functioning mental health, partially impaired for moving around who needs daily care, multiple times a day
GIR 4	Person who needs help to stand up and bath, but can move around in autonomy
GIR 5	Person who needs help with bath, food preparation and house cleaning
GIR 6	Person autonomous in her daily activities

Measuring incapacities

- **Administrative measure**
  - 1.2 million APA recipients in France
  - Mostly women (75%) and 50% over 85 years old
  - But conservative measure due to non-take up of APA

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  - But conservative measure due to non-take up of APA
- **Survey sources**
  - Survey *Handicap-Santé* in France
  - Using ADL and IADL scales to assess whether some restrictions to daily activities
  - 7 million over age 60 with at least one functional limitation
  - 3.2 million at home with some restricted IADL
  - 1.2 million at home with some restricted ADL

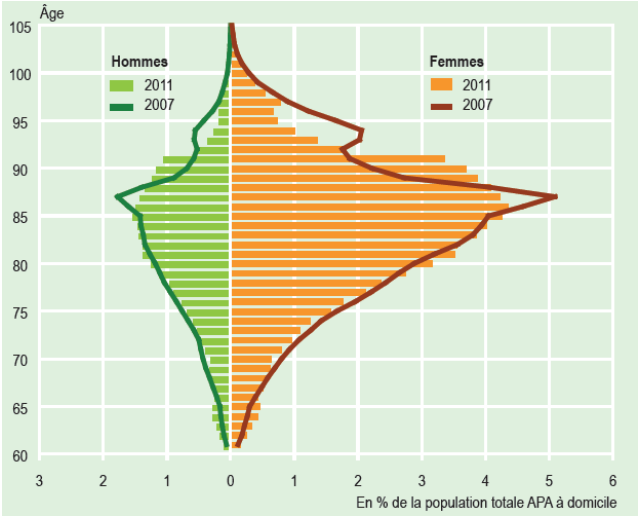
Measuring incapacities

Table 2 – Distribution of APA recipients by GIR

GIR	Men	Women	All
GIR 1	3%	2%	3%
GIR 2	20%	17%	17%
GIR 3	23%	21%	22%
GIR 4	54%	60%	58%

SOURCE : DREES (2014), "Les bénéficiaires de l'allocation personnalisée d'autonomie à domicile et leurs ressources en 2011", *Etudes et Résultats*, No. 876.

Figure 5 – APA recipients by age and sex in 2007 and 2011



SOURCE : DREES (2014), "Les bénéficiaires de l'allocation personnalisée d'autonomie à domicile et leurs ressources en 2011", *Etudes et Résultats*, No. 876.

Figure 6 – Physical limitations

	20-59 ans			60 ans ou plus		
Limitations physiques *Pouvez-vous, sans aide, ...?*	**Sans difficultés**	**Avec difficultés**	**Pas du tout**	**Sans difficultés**	**Avec difficultés**	**Pas du tout**
voir clairement les caractères d'imprimerie d'un journal, avec lunettes si besoin	94,5	4,9	0,6	87,2	10,6	2,1
voir clairement le visage de quelqu'un à 4 m, avec lunettes si besoin	97,4	2,1	0,5	91,4	6,8	1,8
entendre ce qui se dit dans une conversation avec plusieurs personnes, avec appareil si besoin	90,9	8,5	0,6	66,1	30,4	3,5
marcher 500 m sur un terrain plat	96,9	2,2	0,9	78,5	12,6	8,9
monter et descendre un étage d'escalier	95,3	3,7	1,0	70,7	20,6	8,7
lever le bras	96,0	3,6	0,4	82,4	15,1	2,5
vous servir de vos mains et de vos doigts	97,5	2,2	0,2	88,2	11,0	0,8
prendre un objet avec chacune de vos mains	98,2	1,3	0,4	93,6	5,3	1,1
vous baisser ou vous agenouiller	91,7	6,8	1,4	56,9	30,0	13,1
porter un sac à provisions de 5 kg sur une distance de 10m	93,7	4,0	2,2	69,9	15,3	14,7
contrôler vos selles et vos urines	98,0	1,6	0,3	88,4	9,3	2,3
Si difficultés ou ne peut pas, vous débrouiller seul quand cela arrive	*79,9*	*9,8*	*10,3*	*67,1*	*19,5*	*13,4*
A au moins une limitation physique absolue			4,5			24,7

SOURCE : DREES (2010), "Une approche de l'autonomie chez les adultes et les personnes âgées. Premiers résultats de l'enquête Handicap-Santé 2008", *Etudes et Résultats*, No. 718.

Figure 7 – Cognitive limitations

Limitations cognitives *Vous arrive-t-il de…?*	**Non**	**Parfois**	**Souvent**	**Non**	**Parfois**	**Souvent**
ne plus vous souvenir à quel moment de la journée on est	96,3	3,1	0,5	89,9	7,6	2,4
avoir des trous de mémoire	80,4	18,1	1,5	59,6	35,9	4,5
avoir des difficultés pour vous concentrer plus de 10 min	94,8	4,0	1,2	87,3	9,2	3,1
avoir des difficultés pour résoudre les problèmes de la vie quotidienne	96,7	2,2	1,0	90,0	5,8	4,1
avoir des difficultés pour apprendre de nouveaux savoirs ou savoir-faire	93,9	4,7	1,3	80,0	14,0	5,8
avoir des difficultés pour comprendre les autres ou vous faire comprendre	95,8	3,4	0,8	91,9	5,8	2,2
vous mettre en danger par votre comportement	92,0	7,0	0,9	89,6	8,8	1,3
vous voir reprocher d'être trop impulsif ou agressif	75,6	21,3	3,1	75,3	22,0	2,6
Y-a-t'il des activités pour lesquelles on doit vous rappeler, inciter à les réaliser (réponse : oui/non) ?	97,2	2,8		95,2	4,8	
A au moins une limitation cognitive grave			8,4			14,1

SOURCE : DREES (2010), "Une approche de l'autonomie chez les adultes et les personnes âgées. Premiers résultats de l'enquête Handicap-Santé 2008", *Etudes et Résultats*, No. 718.

Figure 8 – ADL restrictions

Les restrictions d'activités dans la vie quotidienne *Avez-vous des difficultés pour réaliser seul/e les activités suivantes ?*	**Sans difficultés**	**Avec difficultés**	**Ne peut pas faire**	**Sans difficultés**	**Avec difficultés**	**Ne peut pas faire**
Les ADL (activités essentielles)						
vous laver	99,0	0,7	0,3	92,8	3,8	3,4
vous habiller et vous déshabiller	99,0	0,8	0,3	93,9	4,0	2,1
couper votre nourriture ou vous servir à boire	99,4	0,3	0,2	96,8	1,6	1,6
manger et boire, une fois la nourriture prête	99,9	0,1	0,1	99,3	0,3	0,4
vous servir des toilettes	99,7	0,1	0,2	98,2	0,7	1,1
vous coucher et vous lever du lit	99,4	0,4	0,2	96,9	1,7	1,3
vous asseoir et vous lever d'un siège	99,5	0,3	0,2	97,4	1,6	1,0
A au moins une restriction ADL absolue			0,4			4,0

SOURCE : DREES (2010), "Une approche de l'autonomie chez les adultes et les personnes âgées. Premiers résultats de l'enquête Handicap-Santé 2008", *Etudes et Résultats*, No. 718.

Figure 9 – IADL restrictions

Les IADL (activités instrumentales)						
faire vos courses	97,7	1,3	1,1	84,8	5,0	10,2
préparer vos repas	99,0	0,4	0,6	92,6	2,8	4,7
faire les tâches ménagères courantes dans votre domicile	97,9	1,4	0,7	86,1	6,9	7,0
faire les tâches plus occasionnelles	97,5	1,4	1,1	81,2	7,6	11,2
faire les démarches administratives courantes	97,7	1,2	1,2	87,1	5,1	7,9
prendre vos médicaments	99,5	0,2	0,3	95,9	1,6	2,5
vous déplacer dans toutes les pièces d'un étage	99,7	0,1	0,1	97,8	0,8	1,3
sortir de votre logement	99,3	0,3	0,4	93,9	1,7	4,4
utiliser un moyen de déplacement	98,8	0,5	0,8	90,4	2,2	7,5
trouver votre chemin quand vous sortez	99,4	0,2	0,3	96,3	0,9	2,9
vous servir du téléphone	99,5	0,2	0,3	97,4	0,8	1,8
vous servir d'un ordinateur	98,9	0,3	0,8	93,7	0,9	5,5
A au moins une restriction IADL absolue			2,7			18,4

Source : DREES (2010), "Une approche de l'autonomie chez les adultes et les personnes âgées. Premiers résultats de l'enquête Handicap-Santé 2008", *Etudes et Résultats*, No. 718.

Projections of care needs

- **Dynamic models of long-term care**
  - Autonomix model (Drees)
  - Destinie model (Insee)
  - TAXIPP-Life (IPP)
- **Data**
  - *Handicap-Incapacités-Dépendance* (HID) 1999–2001
  - *Care* survey, 2018
  - SHARE panel data for estimating transition

Projections of care needs

- **Methodology**
  - Estimate prevalence of disability intensity by individual characteristics
  - Estimate transition between states
  - Assume some form of linkage with mortality reductions in the future
- **Create simplified disability scale**
  1. Autonomous (GIR 5 – 6)
  2. Moderately impaired (GIR 3 – 4)
  3. Severely impaired (GIR 1 – 2)
- **References**
  - Duée and Rebillard (2004) ; Duée et al. (2005), Marbot et Roy (2015)

Projections of care needs

Table 3 – Transition probability

	Variables explicatives				
Y = Probabilité de transition	Cst.	Santé (-)	Etudes	2-3 enfants	Durée = 1
Non dépendant → disability (GIR 1-4)					
Homme, âge <= 75	1.109	1.445	0.484	-	-
Homme, âge >= 75	0.878	1.416	1.095	-	-
Femme, âge <= 80	0.845	1.070	-	0.455	-
Femme, âge >= 80	0.650	1.166	-	-	-
Dépendant (GIR 1-4) → Très dépendants (GIR 1-2)					
Homme, âge <= 75	Probabilité moyenne : 17.4 %				
Homme, âge >= 75	Probabilité moyenne : 32.5 %				
Femme, âge <= 80	Probabilité moyenne : 21.1 %				
Femme, âge >= 80	Probabilité moyenne : 27.5 %				
Moy. dépendant (GIR 3-4) → Très dépendants (GIR 1-2)					
Homme	-0.277	0.512	-	-	0.731
Femme	0.570	0.579	-	-	-

SOURCE : Duée et al. (2005)

Projections of care needs

- **Epidemiological scenarios**
  - Morbidity compression (Fries, 1981)
  - Morbidity increases (Gruenberg, 1973)
  - Dynamic equilibrium (Manton, 1982)
- **How to model these scenarios ?**
  1. Aggregate projections of elderly disability then infer micro prevalence rates
  2. Use death rate as proxy

Projections of care needs

- **Sullivan method (1971)**
  - Combine life tables and disability prevalence to compute life tables without impairment
  - Select as target a level of future life expectancy without disability
  - Infer future prevalence by transformation of initial prevalence with life expectancy target
- **Duée et Rebillard (2004)**
  - Death rate and disability jointly determined

Projections of care needs

- Cohort death rate as proxy for health status

$$health_{t,a} = -\ln\left(\frac{p_{\mu,t,a}}{1 - p_{\mu,t,a}}\right)$$

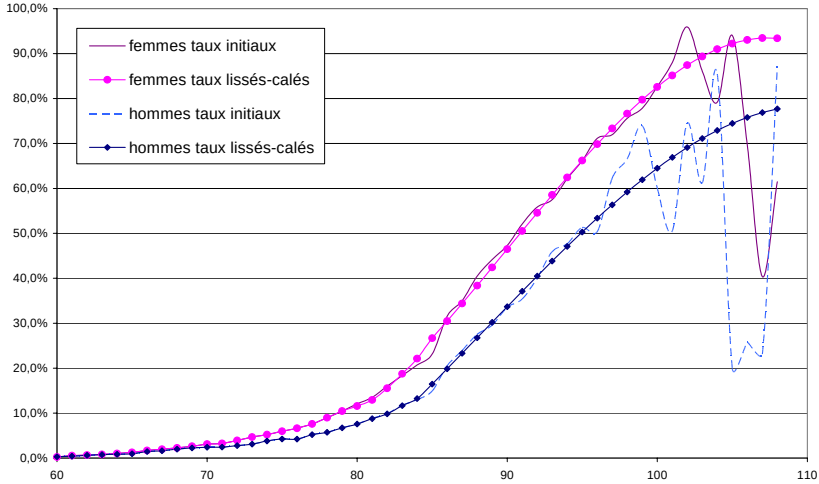
where p_μ, is weighted death rate

$$p_{\mu,t,a} = \mu q_{t,a} + (1 - \mu) q_{t_0,a}$$

- $q_{t,a}$ probability of dying between t and $t+1$ for people aged a in t
- μ relative weight of past vs present

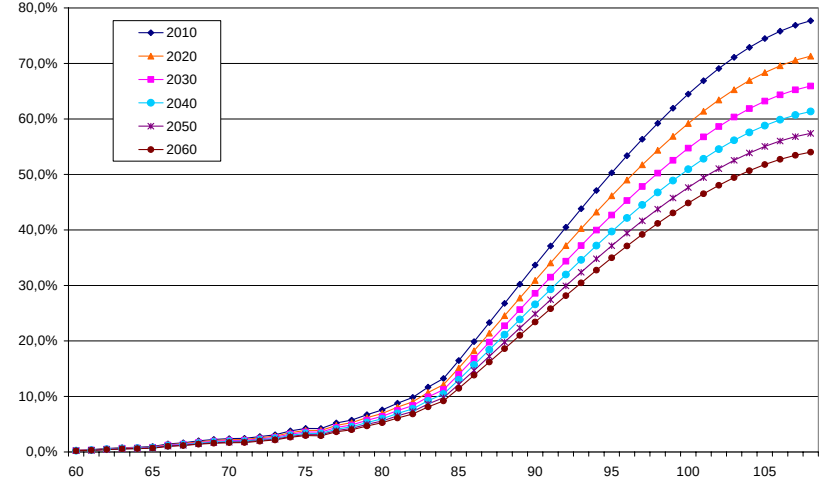
$\Rightarrow$ Adjust μ : micro parametrisation of projections

Projections of care needs



Sources : DREES, remontée de données individuelles anonymisées auprès des bénéficiaires de l'APA, 2006-2007 ; INSEE, projections de population 2007-2060 ; calculs DREES.
Champ : France métropolitaine

Projections of care needs



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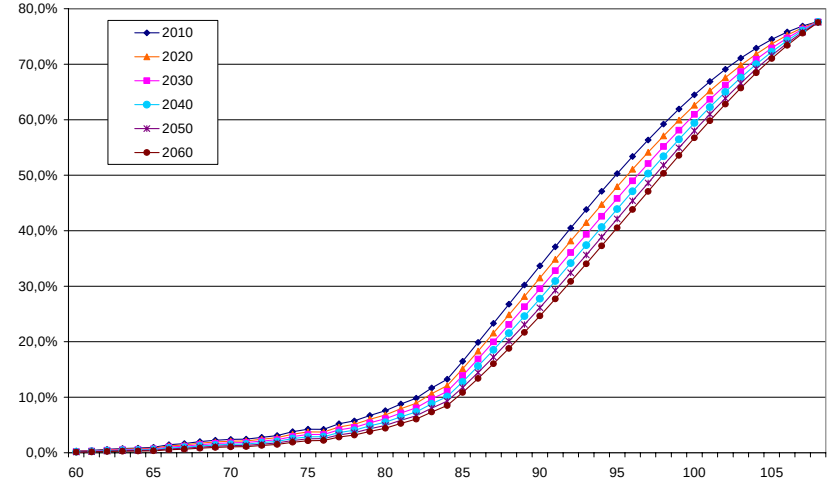
Projections of care needs



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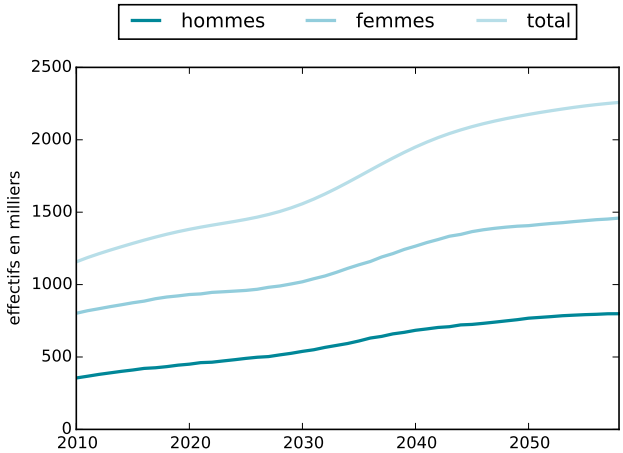
Projections of care needs

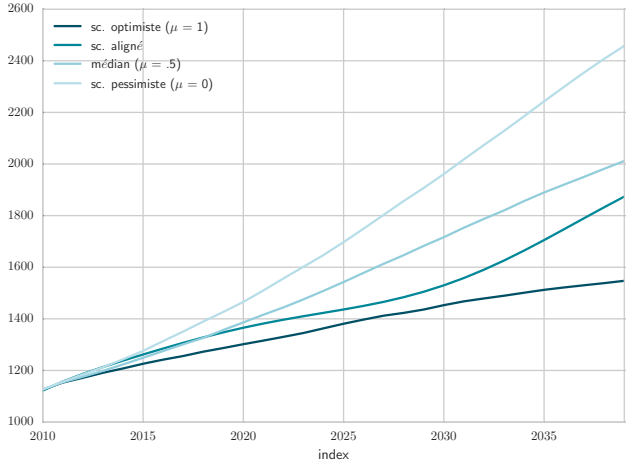
Figure 10 – Population dépendante (2010-2060)



Source : TAXIPP-LIFE 0.0.

Projections of care needs

Figure 11 – Population dépendante (2010-2040)

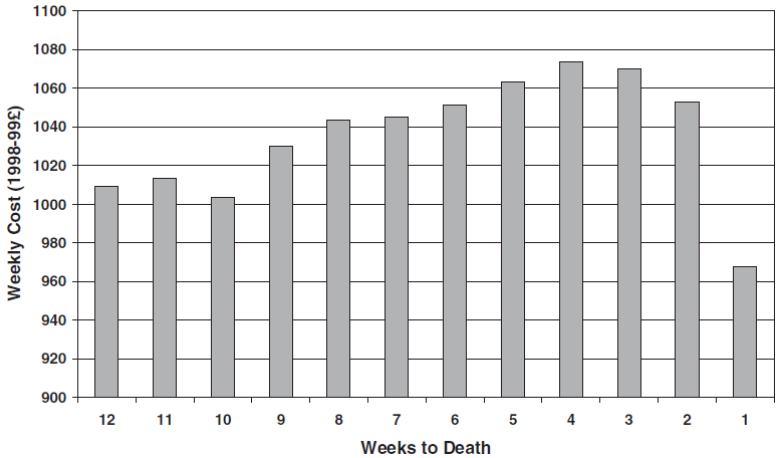


Source : TAXIPP-LIFE 0.0.

Debates on care needs measurement

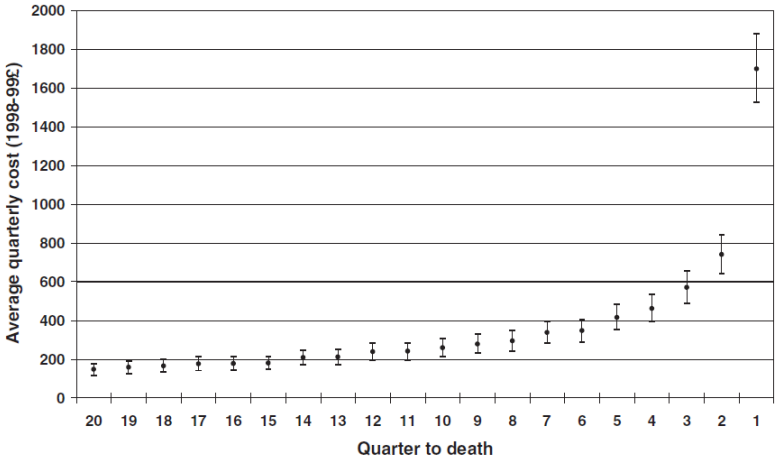
- **Ageing as red herring**
  - Zweifel et al. (1999) argued that focus on age was misleading
  - Real issue for health expenditure is time-to-death
- **Empirical test disputed**
  - Original article challenged (endogeneity of health care spending)
  - Empirical support to the hypothesis using hospital data from England (Seshamani and Gray, HE 2004)
- **Implications**
  - Forecasts based on average expenditure by age group are biased
  - Ignoring time-to-death effect lead to overprediction of future expenditures (Stearns and Norton, 2004)

Figure 12 – Average weekly hospital costs per hospitalised patient in the last quarter of life



SOURCE : Seshamani and Gray (2004), Fig. 2, p. 310.

Figure 13 – Predicted average quarterly cost by time to death



SOURCE : Seshamani and Gray (2004), Fig. 3, p. 311.

Debates on care needs measurement

- **Epidemiologic trends**
  - Strong prior about expected increase in long-term care needs
  - Dementia incidence is decreasing (Satizabal et al., 2016)
- **Bad records in anticipating medical progress**
  - Jones et al. (2016), editors of *New England Journal of Medicine*
  - Cardiovascular epidemics predicted in the 1960s
  - 10-20 years lag before incorporating medical progress in cardiovascular diseases into epidemiological data/models
  - Are current pessimist anticipations about dementia of the same order ?

Table 4 – Temporal trend in the incidence of dementia

Subtype	**Number of cases**	**Total nber obs. x period**	**5-year cumulative hazard rate**			
			Epoch 1 1977-83	Epoch 2 1986-91	Epoch 3 1992-98	Epoch 4 2004-08
Overall dementia	371	9015	3.6	2.8	2.2	2.0
Alzheimer's disease	264	9015	2.0	2.0	1.7	1.4
Vascular dementia	84	9014	0.8	0.8	0.4	0.4

NOTE : Results from the Framingham Heart Study, a longitudinal cohort study that was initiated in 1948. The original cohort comprised 5209 residents of Framingham, MA, in the U.S. and these participants have undergone up to 32 examinations, performed every 2 years, that have involved detailed history taking by a physician, a physical examination, and laboratory testing
SOURCE : Satizabal, et al. (2016), Tab. 2, p. 528.

II. Long-term care provisions

1. Informal care
2. Formal home care
3. Nursing homes
4. Ageing-in-place policies

Informal care

- **Definition**
  - Unpaid care provided by adult children or spouse or siblings
  - A non market good
  - The most common form of long-term care
- **Economics of informal care**
  - Understanding determinants of informal care is key to design policies adapted to family and state supports
  - Informal care is unpaid but still costly to society
  - Efficiency design of policies should take into account costs and benefits of informal care

Informal care

- **Main issues**
  1. Supply of informal care
  2. Substitution with formal care
  3. Impact on labour market participation of caregivers
  4. Impact on health conditions of caregivers

Informal care

- **Measuring the extent of informal care**
  - In Europe, 35% of elderly individuals report some informal care (Bolin, et al. 2008)
  - Wide heterogeneity across countries
  - Time spent providing informal care hard to measure reliably
- **Measuring the economic cost of informal care**
  - Valuing the opportunity cost
  - Large estimations
    e.g., for France 7 to 11 billion euros

Table 5 – Intensity of informal care giving in Europe

Country	Weekly hours		Any informal care		Weekly hours (if > 0)	
	Male	Female	Male	Female	Male	Female
Germany	2.32	1.77	0.35	0.27	6.70	6.59
Austria	2.31	2.07	0.50	0.44	4.57	4.75
Sweden	0.87	1.28	0.53	0.53	1.65	2.43
Netherlands	2.18	2.64	0.58	0.55	3.76	4.80
Spain	0.40	1.36	0.11	0.12	3.76	11.72
Italy	1.08	3.97	0.22	0.26	4.99	15.38
France	1.25	1.50	0.41	0.40	3.02	3.74
Denmark	1.40	1.52	0.62	0.57	2.25	2.68
Greece	1.10	2.49	0.23	0.24	4.88	10.20
Switzerland	1.07	1.20	0.47	0.48	2.27	2.50
Total	1.50	2.09	0.42	0.40	3.59	5.25
Obs.	1718	2079	1718	2079	715	828

NOTE : Sample from SHARE data 2004 of respondents aged 50 to 64, having at least one living parent. Informal care is measured as given to the respondent's parents.
SOURCE : Bolin, Lindgren and Lundborg (2008), Tab. 3, p. 725.

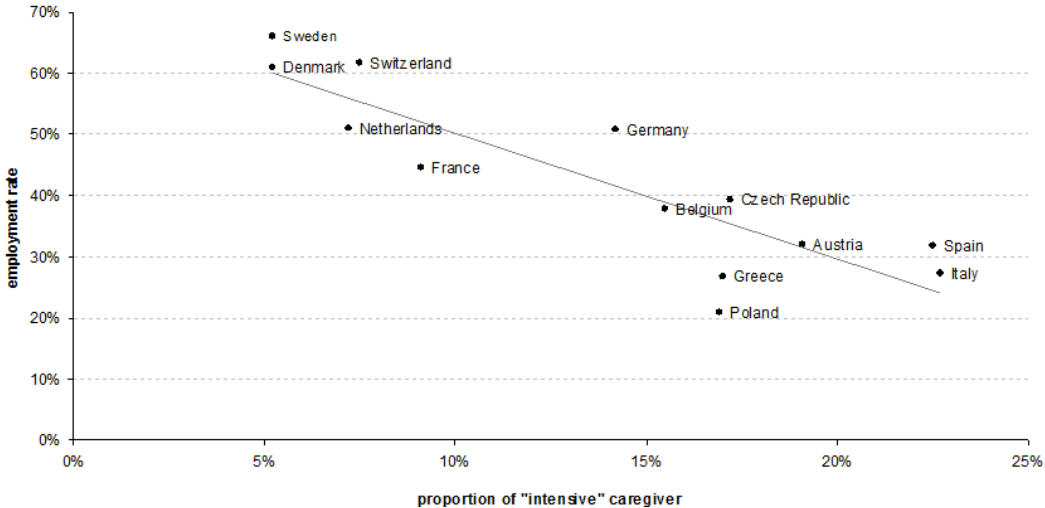
Informal vs formal care

- **Substitute or complement ?**
  - Substitute : informal care could replace formal care
  - Complement : informal care could lead to more formal care (e.g., more doctor visits)
- **Empirical estimates**
  - Challenge : informal care is endogenous with unmeasured health status that also affects care use
  - Need instruments of informal care (e.g., gender of children)
  - U.S. data evidence of substitution (Van Houtven and Norton, 2004)
  - In Europe, substitution with formal home care but complement to doctors and hospital visits (Bolin et al. 2008)

Impact on labour supply

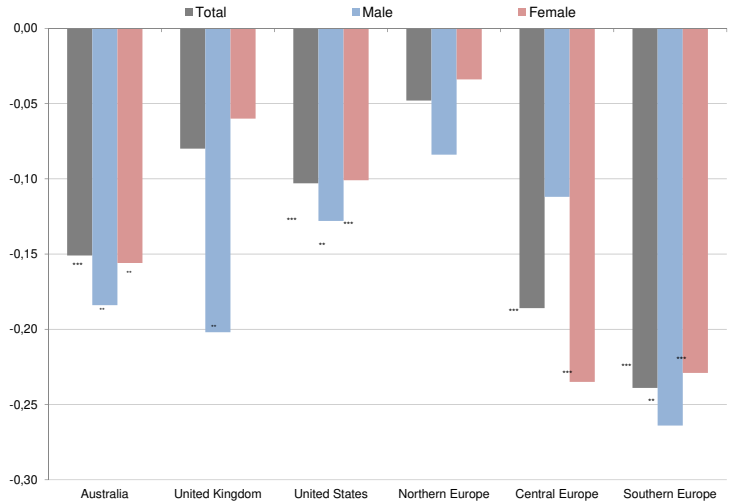
- **Caregiving takes time**
  - Intensive margin : caregivers could reduce hours of work
  - extensive margin : caregivers could give up employment
- **Empirical estimates**
  - Challenge : informal care is endogenous with low labour market attachment
  - Negative association between informal care and probability of working (-5%)
  - Accounting for endogeneity makes the relationship stronger (-30%) (Crespo, 2006)

Figure 14 – Correlation between employment rate and proportion of intensive caregivers



Source : SHARE survey, OECD (2011)

Figure 15 – Informal caring impact on labour supply (dynamic probit)

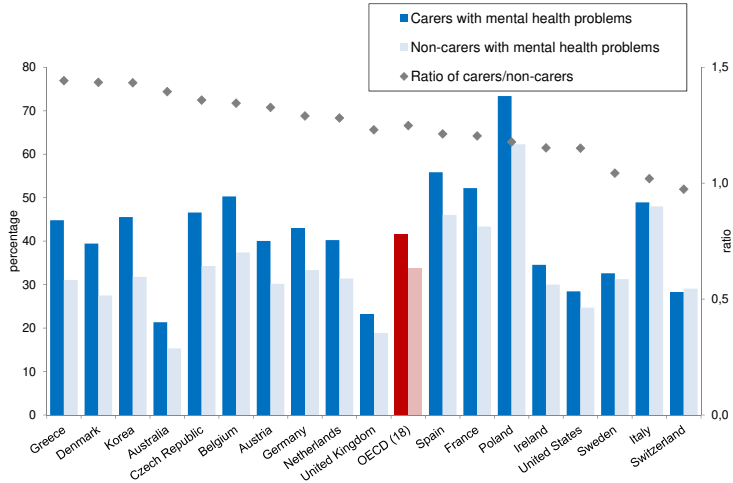


Source : OECD *Help Wanted*, Colombo et al. (2011), Fig. 3.6, p. 94.

Impact on health

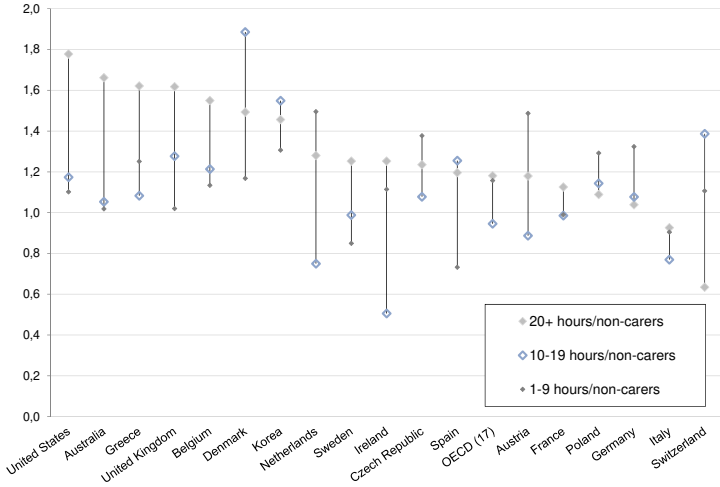
- **Unclear direction of causality**
  - Caregiving is physically and mentally demanding
  - Those providing care (spouse, siblings) could have related conditions
- **Empirical estimates**
  - Coe and Van Houtven (2009) : modest negative impact in short term
  - Larger negative impact after two years (increased depression, worse physical health)

Figure 16 – Mental health problems of care givers



Source : OECD *Help Wanted*, Colombo et al. (2011), Fig. 3.10.A, p. 99.

Figure 17 – Mental health problems of care givers according to the intensity of caring

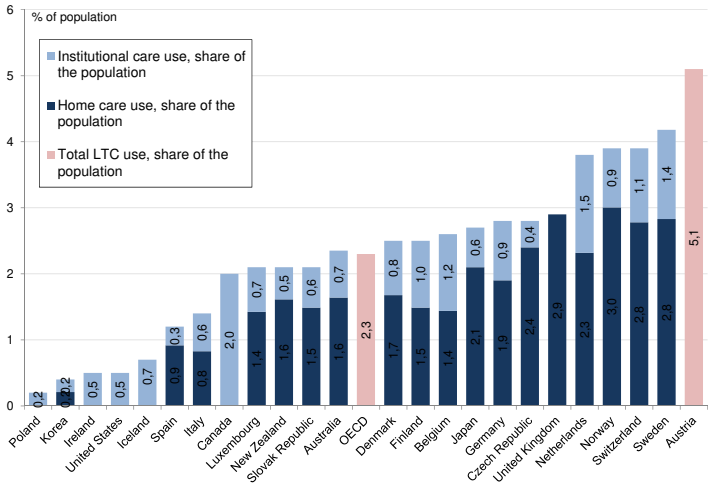


Source : OECD *Help Wanted*, Colombo et al. (2011), Fig. 3.11, p. 100.

Formal home care

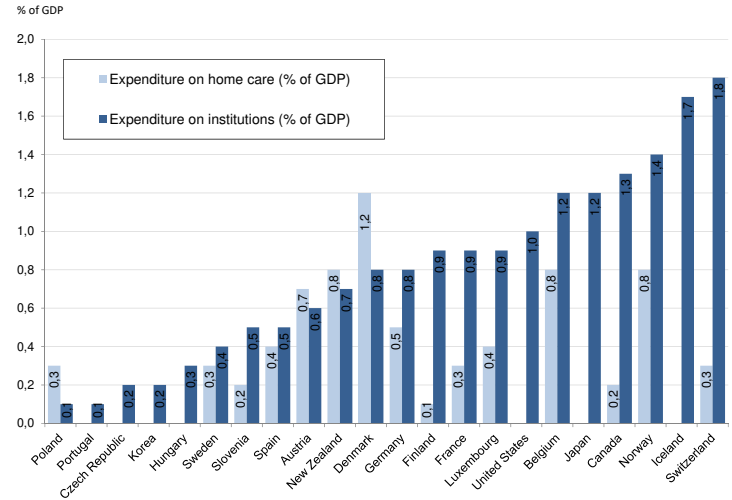
- **Cash and counseling**
  - Cash benefit to elderly to buy formal or informal care at home
  - People prefer to stay at home
  - Cost is presumed lower for the government
- **Evaluations**
  - Randomization in the U.S. (Carlson et al. 2007) : increased quality of life but increased cost too
  - RCT in the U.K. found no effect in health outcomes

Figure 18 – LTC users as share of the population in OECD countries, 2008



Source : OECD *Help Wanted*, Colombo et al. (2011), Fig. 1.2, p. 40.

Figure 19 – LTC expenditures at home vs in institutions (2008)



Source : OECD *Help Wanted*, Colombo et al. (2011), Fig. 1.9, p. 48.

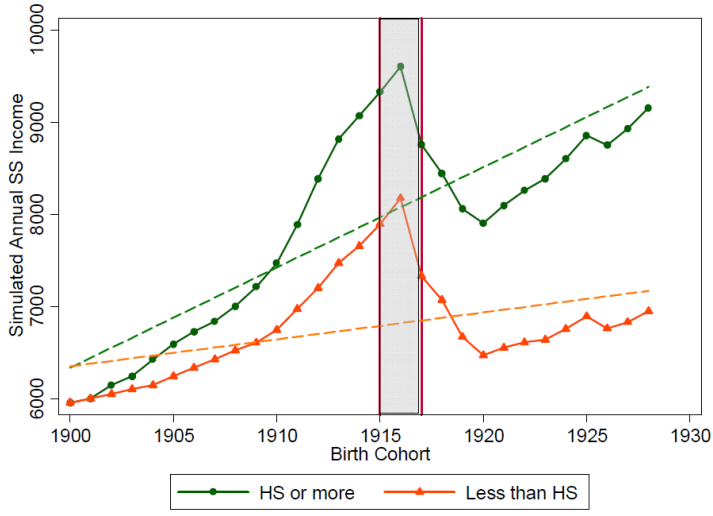
Formal home care

- **Home health care**
  - Providing medical and non medical services at home
  - Less expensive than nursing home with higher quality of care than informal care
  - It allows people to stay at home for longer
- **Demand-driven increases**
  - In the U.S., higher incentives to use home health care has led to soaring costs
  - Demand-side moral hazard

Formal home care

- **Goda, Golberstein and Grabowski (JHE, 2011)**
  - Assess impact of income on utilization of long-term care services
  - Data from Assets and Health Dynamics among the Oldest Old (AHEAD)
  - Exploit the US Social Security Notch as exogenous variation in income
- **Methodology**
  - IV estimates using as instrument a dummy for being born in 1915-17
  - Compare probit estimates with IV probit
  - Small sample so no possible to exploit precisely date of birth variations

Figure 20 – Impact of Social Security notch on income by education level



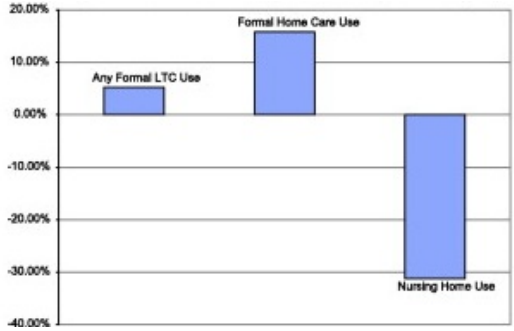
NOTE : HS : high-school level.
SOURCE : Goda et al. (2011), Fig. 1, p. 720.

Table 6 – Effect of Social Security income on long-term care use

	Any long-term care		Formal home care		Nursing home	
	Probit	IV Probit	Probit	IV Probit	Probit	IV Probit
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
SS income (1000s of 1993 $)	-0.0313***	0.0430	-0.0287**	0.1069*	-0.0177	-0.1573***
	(0.0107)	(0.0555)	(0.0119)	(0.0603)	(0.0114)	(0.0604)
Marg. effects	-0.0093	0.0133	-0.0075	0.0310	-0.0026	-0.0278
Dep. var. mean	0.2530	0.2530	0.1958	0.1958	0.0892	0.0892
Effect (in percentage)		5.25		15.8		-31.1
Observations	2283	2283	2142	2142	2283	2283

SOURCE : Goda et al. (2011), Tab. 4, 5 and 6, p. 725, cubic age specification.

Figure 21 – Effect of $1000 Increase in Social Security Income on Long-Term Care Use



Source : Goda et al. (2011).

Goda, Golberstein and Grabowski (JHE, 2011)

- **Main results**
  - No effect on overall long-term care utilization
  - Decrease in nursing home : a 10% increase in annual SS income decrease the likelihood of any nursing home use by 24-34%
  - Increase in paid home care : a 10% increase in annual SS income increase the likelihood of receiving any paid home care use by 15-16%
- **Implications**
  - Independence is a valued good which leads elderly individuals to choose less restrictive settings for long-term care services when afforded by higher income

Nursing homes

- **Low quality of care**
  - Low quality of nursing home in many countries (e.g., U.S., France)
  - Nurse staffing essential : increased nurses per resident lead to increased quality
- **Retaining staff**
  - High turnover in nursing homes
  - Difficult to recruit skilled nurses
- **Low information on quality**
  - Residents often have difficulty judging quality
  - Families have little information pre-admission

Ageing-in-place policies

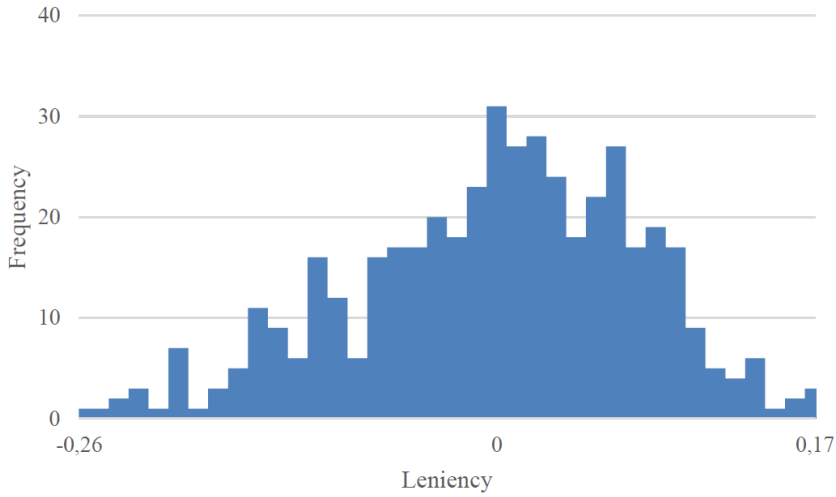
- **Motivations**
  - To contain rising LTC costs (cheaper home care vs nursing home)
  - Higher satisfaction and quality of life
  - To respond to the wish of individuals
- **Ageing-in-place policies**
  - Increased supply of home care
  - Tightening eligibility for institutional care
  - Move nursing home towards more severe needs
  - Increase co-payments for institutional care
- **But scarce evidence of impact**
  - Kim and Lim (JPuBE, 2015) on Korea : no impact on expenditures

Bakx, Wouterse, van Doorslaer and Wong (JHE, 2020)

- **Nursing home admission in the Netherlands**
  - All LTC cost covered by the public LTC insurance scheme, and almost no option to bypass the public system
  - An independent gov. agency *Centrum Indicatiestelling Zorg* (CIZ) decides the level of care for which applicants are eligible

- **Empirical strategy**
  - Exploit leniency of assessors in admission criteria (similar strategy as Maestas et al., 2013)
  - IV estimate using leniency as instrument
  - Use administrative data from CIZ

Figure 22 – Distribution of leniency measure in nursing home admission



Source : Bakx et al. (2020), Fig. 1, p. 8.

Figure 23 – Impact on nursing home admission of becoming eligible for a nursing home admission (first stage)

	A NHA within:				
	3 months	6 months	1 year	1.5 year	2 year
Effect of ENHA (γ)	0.156	0.205	0.184	0.137	0.111
	(0.028)***	(0.031)***	(0.031)***	(0.032)***	(0.031)***
First stage					
Effect of leniency (λ)	0.973	0.973	0.973	0.963	0.963
	(0.023)***	(0.023)***	(0.023)***	(0.026)***	(0.026)***
F-statistic leniency	1599	1599	1599	1379	1379
(p-value)	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Partial R^2 leniency	0.035	0.035	0.035	0.035	0.035
Number of observations	51047	51047	51047	44261	44261

SOURCE : Bakx et al. (2020), Tab. 3, p. 11.

Figure 24 – Impact on mortality of becoming eligible for a nursing home admission

	Mortality within:					Having ≥ 1 hospital admission	Charlson index
	3 months	6 months	Next year	1.5 years	2 years	Next year	Next year
Effect of ENHA (γ)	0.010	0.019	0.032	0.022	-0.002	-0.089	-0.035
	(0.013)	(0.017)	(0.023)	(0.026)	(0.028)	(0.040)**	(0.068)
First stage							
Effect of leniency (λ)	0.973	0.973	0.973	0.973	0.973	0.955	0.955
	(0.023)***	(0.023)***	(0.023)***	(0.023)***	(0.023)***	(0.032)***	(0.032)***
F-statistic	1599	1599	1599	1599	1599	918	918
(p-value)	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
Partial R^2	0.035	0.035	0.035	0.035	0.035	0.034	0.034
Number of observations	51047	51047	51047	51047	51047	29391	29371

SOURCE : Bakx et al. (2020), Tab. 3, p. 11.

Figure 25 – Impact on health care expenditures of becoming eligible for a nursing home admission

	Nursing home care expenditures		Home care expenditures		Medical care expenditures		Total expenditures	
	Next year	2 years later	Next year	2 years later	Next calendar year	2 next calendar years	Next calendar year	2 next calendar years
Effect of ENHA (γ)	7991.49 (1095.55)***	12447.46 (2444.58)***	-6404.96 (1204.09)***	-11137.42 (2262.34)***	-1500.34 (620.637)**	-1419.60 (1077.12)	619.49 (1688.525)	1358.60 (3315.3
First stage								
Effect of leniency (λ)	0.973 (0.023)***	0.963 (0.026)***	0.973 (0.023)***	0.963 (0.026)***	0.991 (0.026)***	1.021 (0.031)***	0.991 (0.026)***	1.021 (0.031)*
F-statistic (p-value)	1599 (0.000)***	1379 (0.000)***	1599 (0.000)***	1379 (0.000)***	1422 (0.000)***	1075 (0.000)***	1422 (0.000)***	1075 (0.000)*
Partial R^2	0.035	0.035	0.035	0.035	0.036	0.037	0.036	0.037
Number of observations	51047	44261	51047	44261	44064	31986	44064	31986

SOURCE : Bakx et al. (2020), Tab. 3, p. 11.

Bakx et al. (JHE, 2020)

- **Main results**
  - Nursing home admission is affected by the leniency of the assessor
  - No effect of nursing home on mortality risk
  - No effect of nursing home on healthcare spending
    - the eligible would otherwise have used an amount of home care that is almost equally expensive
- **Implications**
  - Health problems of the LTC applicants at the margin of eligibility are so severe that intensive care is needed to enable them to continue living at home

  $\Rightarrow$ Ageing-in-place may not be saving health care expenditures

III. Insuring against long-term care risk

1. High uninsured risk
2. Why so little private insurance ?
3. Which design for public policies ?

Large and uncertain risk

- **High out-of-pocket expenditures**
  - Nursing home cost on average $6000 p.m. (in the U.S.)
  - 33% long-term care expenditures paid out-of-pocket
- **High variance of expenditures**
  - 35%-50% of 65 year-old will use nursing home (in the U.S.)
  - among which 10-20% more than 5 years
- **Insurance dominates self-insurance (Barr, 2010)**
  - If annual cost of 30K, duration of 0-20 years, one would need 600K of savings to cover the maximum risk
  - If probability $= 1/6$, average duration 2 years, insurance cost $=$ 10K

$\Rightarrow$ **Large and uncertain risk suggests great value to insurance**

High uninsured risk

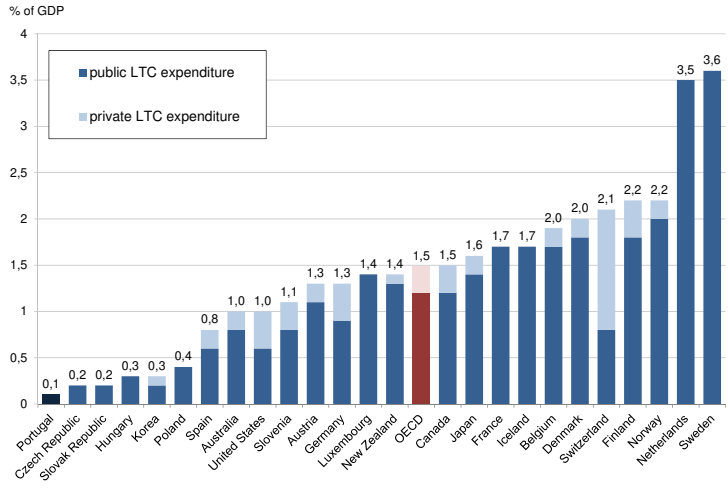
- **Incomplete public coverage in many countries**
  - U.S. : means-tested benefit with Medicaid
  - U.K. and Canada : means-tested benefit
  - Germany, Japan, Austria, France : universal social insurance but limited coverage
- **Little private insurance coverage**
  - U.S. 14% of 60+ had a long-term care insurance policy (HRS 2008 data)
  - Typical policy only covers 2/3 of long-term care cost, with a premium of \$4,500 per year

Figure 26 – Private Long-Term Care Insurance Ownership Rate (U.S., 2008)

		By wealth quintile				
	Whole sample	*Top*	*Fourth*	*Third*	*Second*	*Bottom*
Whole sample	13.8%	26.9%	19.0%	10.7%	6.6%	4.1%
By gender						
Men	13.6%	25.5%	17.1%	10.0%	4.8%	5.5%
Women	13.9%	28.4%	20.7%	11.2%	7.8%	3.3%
By marital status						
Married	16.3%	28.0%	19.2%	10.3%	5.9%	5.5%
Single	10.4%	23.5%	18.8%	11.2%	7.3%	3.6%
By age group						
60–64	12.7%	24.1%	18.7%	9.3%	5.8%	4.7%
65–69	14.7%	29.6%	19.4%	8.8%	5.9%	5.5%
70–74	15.0%	29.6%	16.8%	14.8%	6.6%	3.5%
75–79	14.7%	28.2%	21.1%	10.5%	8.6%	2.6%
80–84	13.9%	25.0%	20.8%	12.5%	6.9%	5.0%
85+	10.9%	22.1%	19.2%	8.7%	7.6%	1.6%

SOURCE : Brown and Finkelstein (2011), Tab. 1, p. 124.

Figure 27 – LTC expenditures in OECD countries



Source : OECD *Help Wanted*, Colombo et al. (2011), Fig. 1.8, p. 46.

Why so little private insurance ?

- **Supply side market failures**
  - asymmetric information (adverse selection and moral hasard)
  - imperfect competition
  - transaction costs
  - dynamic problems in long-term contracting (learning and lapsing ; aggregate risk)
- **Limited demand**
  - Imperfect but cheaper substitute (Medicaid in the U.S., financial transfer from kids, informal care)
  - Limited rationality

Why so little private insurance ?

- **What is the price of insurance ?**
  - Relevant price is not the premium but the load
  - Load is the excess of premium over expected claim

Why so little private insurance ?

- **What is the price of insurance ?**
  - Relevant price is not the premium but the load
  - Load is the excess of premium over expected claim
- **Loads of an insurance policy**

$$load = 1 - \frac{PDV\ of\ benefits}{PDV\ of\ premiums}$$

  - Actuarially fair policy has a load of 0
  - High load means low expected return

Why so little private insurance ?

- **Brown and Finkelstein (JPubE, 2007)**
  - Use market-wide premium data from Weiss Ratings'
  - Compute loads and comprehensiveness of policy offered

Why so little private insurance ?

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- **Computing loads**

$$load = 1 - \frac{\sum_{t=0}^{T} \sum_{s=1}^{5} \frac{Q_{t,s} \min(X_{t,s} B_{t,s})}{\Pi_{j=0}^{t}(1+i_j)}}{\sum_{t=0}^{T} \sum_{s=1}^{5} \frac{Q_{t,s} P_s}{\Pi_{j=0}^{t}(1+i_j)}}$$

  - Need premium P, benefits B, current and projected utilization rates Q and current and projected costs X, and interest rate i
  - Results are sensitive to projection of costs and utilization

Why so little private insurance ?

Table 7 – Loads of "typical" insurance policy in the U.S. (cents on the dollar)

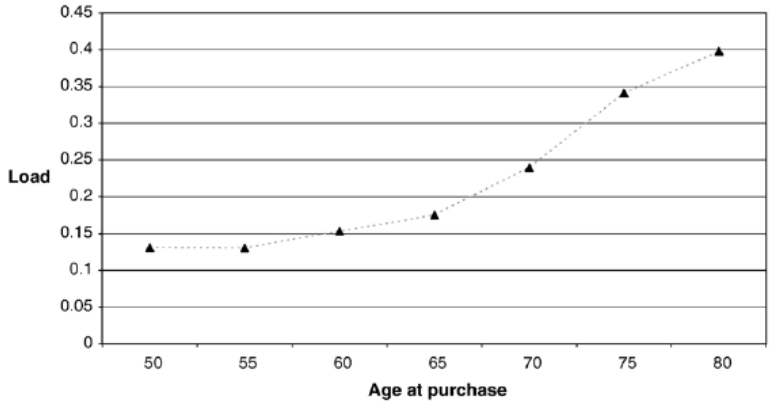
	Policy held till death	Accounting for policy termination probabilities
Unisex	32.1	49.9
Male	55.4	66.4
Female	13.2	36.0

NOTE : Estimates of load expressed in terms of cents on the dollar for a policy purchased at age 65.
SOURCE : Brown and Finkelstein (2011), Table 3, p. 128.

- **High loads estimated for long-term care insurance**
  - Loads of 32 cents on the dollar
  - Compared to 6-10 cents for group health insurance

Why so little private insurance ?

Figure 28 – Loads by age of purchase



SOURCE : Brown and Finkelstein (2007), Fig. 1, p. 1981.

Why so little private insurance ?

Figure 29 – Loads on typical policy purchased for 65 year old, by gender

	Policy held until death		Accounting for termination probability	
	Male	Female	Male	Female
Base case	0.44	−0.04	0.65	0.39
Alternative assumptions				
Corporate interest rate	0.50	0.07	0.68	0.44
Real cost growth 3%/year	0.40	−0.12	0.63	0.34
Real cost growth 0.75%/year	0.46	−0.004	0.66	0.41
Top five companies	0.45	−0.03	0.66	0.39
Spousal discount (10%)	0.41	−0.09	0.64	0.35

SOURCE : Brown and Finkelstein (2007), Tab. 7, p. 1983.

Why so little private insurance ?

- **Implicit tax from Medicaid in the U.S.**
  1. Asset and income test : individuals who own private insurance are less likely to be eligible
  2. Secondary payer : Medicaid comes after any benefit paid by private insurers

- **Brown and Finkelstein (AER, 2008)**
  - For males, 60% PDV of private insurance benefits are redundant with Medicaid
  - For females, implicit tax is close to 75%
  - Medicaid provides very imperfect consumption-smoothing for all but the poorest Americans

Why so little private insurance ?

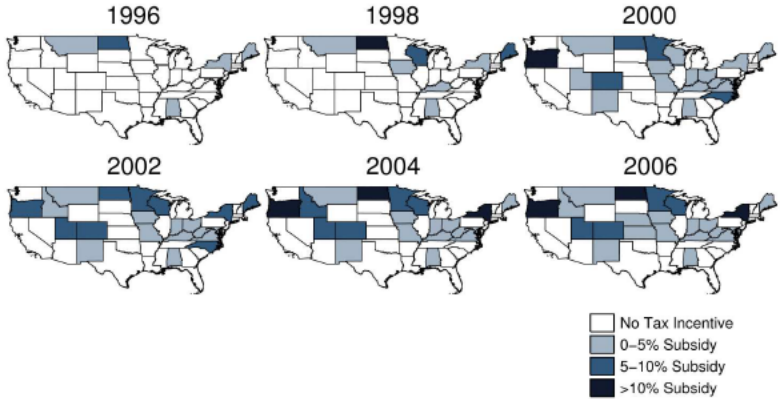
- **Individual failures**
  - Underestimation of risk
  - Low utility of consumption when disabled (Finkelstein, Luttmer and Notowidigdo, 2008)

- **Long-term uncertainties**
  1. Organisation and delivery of long-term care likely to change
  2. Public sector coverage might increase in the future
  3. Aggregate risks of increased long-term care spending not well pooled by insurance companies (not idiosyncratic risks)

Tax subsidies for long-term care insurance

- **Tax expenditure for health care coverage**
  - Large subsidy in the U.S. for employer-sponsored health care insurance
  - No subsidy for LTC insurance before the 1990s
  - Expansion of small subsidy by U.S. States from 1996 onwards
- **Goda (JPubE, 2011)**
  - Exploit state LTC subsidies 1996–2006
  - Data from the Health and Retirement Study (HRS)
  - Estimate impact of tax subsidy on LTC private insurance

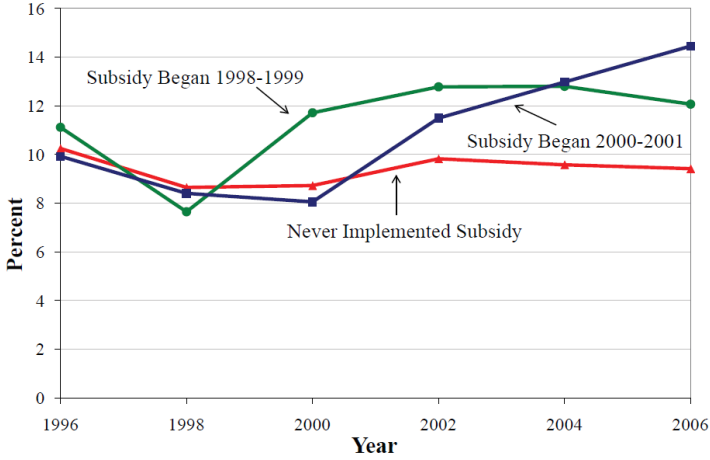
Figure 30 – Tax incentive generosity over time, 1996–2006



Source : Health and Retirement Study (HRS) and NBER's TAXSIM calculator ; Goda (2011), Fig. 1, p. 745.

Goda (JPubE, 2011)

Figure 31 – Private long-term care insurance coverage, age 50-69



SOURCE : Health and Retirement Study (HRS) ; Goda (2011), Fig. 2, p. 745.

Goda (JPubE, 2011)

- Estimating the following specification :

$$LTCI_i = \gamma SUBSIDY_{st} + \beta X_i + \omega_t + \sigma_s + \mu_i + \varepsilon_{ist}$$

– $SUBSIDY_{st}$ is a binary variable, whether state s has a subsidy at time t

Table 8 – Linear Estimates of the Effect of Tax Subsidy Programs on Private Long-Term Care Insurance Coverage

	(1)	(2)	(3)	(4)
Subsidy	0.023**	0.028**	0.024**	0.027***
	(0.009)	(0.011)	(0.011)	(0.009)
State + Year Fixed Effects	No	Yes	Yes	Yes
Control Variables	No	No	Yes	Yes
Individual Fixed Effects	No	No	No	Yes

SOURCE : Goda (2011), Tab. 3, p. 748.

Goda (JPubE, 2011)

- **Estimating the net expenditure effect of LTC subsidies**
  - The stated objective of implementing tax incentives at the state level is to reduce Medicaid expenditures for long-term care
  - Simulation of the impact of subsidies on tax expenditure, private LTC insurance, Medicaid expenditures

- **Simulation results**
  - At low levels of wealth, the potential Medicaid savings from higher private insurance coverage is large, but the response to the tax subsidy is low
  - At high levels of wealth, there is a large degree of response to the tax subsidy, but increased private insurance coverage does not substantially change the share of long-term care expenses paid for by Medicaid for these groups

Figure 32 – Estimated Net Government Benefit from Tax Subsidy for 65-Year-Olds by Wealth Decile

Source : Goda (2011), Fig. 3.A, p. 754.

Which design for public policies ?

1. **Tax finance for means-tested benefit**
   - Means-tested benefits for low income households

   e.g., U.S., U.K., France pre-2002

2. **Social insurance ex ante (Barr, 2010)**
   - Mandating public insurance without means-testing
   - Funded by contribution during working life

   e.g., Germany, the Netherlands

3. **Social insurance ex post**
   - Mandating public insurance without means-testing
   - Funded by contribution of retirees, or paid at death on estate

   e.g., Proposals by Loyld (2008), Masson (2015)

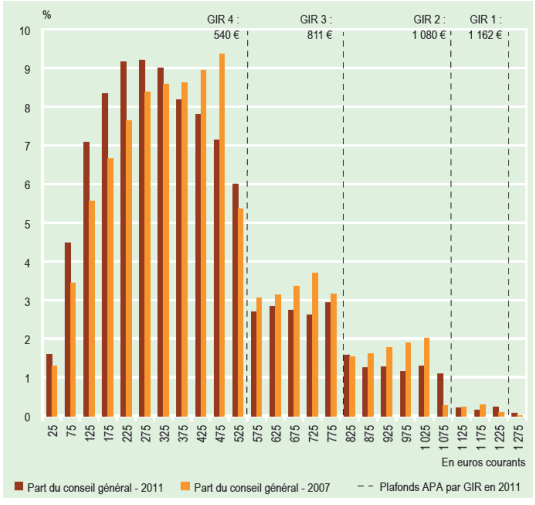
LTC in France

- **Prestation spécifique dépendance (PSD), 1997–2002**
  - Benefits for low income households
  - Benefit means-tested on wealth and future inheritance
  - Low take-up by families to avoid leaving debt to their children
- **Allocation personnelle d'autonomie (APA)**
  - Allowance introduced in 2002 to replace PSD
  - Not means-tested, but co-payments increase with income
  - Restricted to 60+ individuals (split of LTC policy by age threshold)
  - Assessment of eligibility by AGGIR grid (GIR 1–4 eligible)
  - Managed and funded at the local level (*departement*)

LTC in France : APA at home

- **Amounts depend from GIR level**
  - Care needs (*plan d'aide*) defined by *departement*
  - GIR4 : up to 746 EUR/month
  - GIR1 : upt to 1914 EUR/month
- **Share of co-payments increases with income**
  - 0 co-payment below 864 EUR/month
  - Between 0 and 90% between 864 and 3184 EUR
  - 90% co-payment for income above 3181 EUR/month

Figure 33 – Distribution of monthly APA benefits



SOURCE : DREES (2014), "Les bénéficiaires de l'allocation personnalisée d'autonomie à domicile et leurs ressources en 2011", *Etudes et Résultats*, N°876.

Netherlands : public LTC insurance

- **Algemene Wet Bijzondere Ziektekosten (AWBZ)**
  - Since 1968 mandatory LTC insurance
  - Separate insurance from health insurance
- **Coverage**
  - Elderly and chronically ill
  - Mentally handicapped persons
  - Physically handicapped persons
  - Chronic psychiatric patients
- **Funding**
  - Income-related contribution (12.15% up to 31,589 EUR)
  - State subsidy
  - Co-payments

Netherlands : public LTC insurance

Table 9 – Funding and expenses of AWBZ (2007-2008)

Sources of funding	Payments (billion euros)	Share of total payments
Income-related contributions	13.1	68%
State subsidy (from general taxation)	4.6	24%
Co-payments	1.7	9%
Total	19.3	
Type of LTC user	**Expenditure (billion euros)**	**Share of total expenditure**
Elderly and chronically ill	11.4	65%
Mentally handicapped persons	4.6	26%
Physically handicapped persons	0.5	3%
Chronic psychiatric patients	1.1	6%
Total	17.6	

NOTE : Funding payments in billion euros for 2008, and expenditures for 2007.
SOURCE : Schut and Van den Berg (2010), Tab. 1 and 2, p. 414.

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