



International Association for the
Study of Insurance Economics

Études et Dossiers

Extract from

Études et Dossiers No. 348

**5th Geneva Association Health & Ageing
Conference**

**Long Term Care –
Risk Profiles, Determinants and Financing**

6-7 November 2008
London

This document is free to download from The Geneva Association website, www.genevaassociation.org

November 2008

**Working Paper Series of
The Geneva Association**

© Association Internationale pour l'Etude de l'Economie de l'Assurance

The Geneva Association - General Secretariat - 53, route de Malagnou - CH-1208 Geneva
Tel.: +41-22-707 66 00 - Fax: +41-22-736 75 36 - secretariat@genevaassociation.org - www.genevaassociation.org

The Geneva Association Working Paper Series “Études et Dossiers” appear at irregular intervals about 10 – 12 times per year. Distribution is limited.

The “Études et Dossiers” are the working paper series of The Geneva Association. These documents present intermediary or final results of conference proceedings, special reports and research done by The Geneva Association. Where they contain work in progress or summaries of conference presentations, the material must not be cited without the express consent of the author in question.

This document is free to download from The Geneva Association website, please visit: www.genevaassociation.org

Layout & Distribution: Valéria Kozakova

On the Determinants of Long Term Care with Reference to Dementia...

Jean François Dartigues

Age, gender, severity of dementia and place of residence are major determinants of long term care in dementia, but methodological difficulties are important to estimate their real impact

Medical care resort and dementia. 3C Study

resort	prevalent cases		incident cases	
	1999-2000		2003-2004	
No resort	71	33,0%	44	32,1%
GP* only	139	35,8%	44	32,1%
GP and specialist	62	28,8%	46	33,6%
treated*	32	14,9%	23	16,8%
Missing data	5	2,3%	3	2,2%
Total	215	100%	137	100%

* GP : General practitioner ; treated : Cholinesterase inhibitors or memantine
Helmer C et al, Dementia Geriatr Cog Dis 2008; 26:407-415

Medical care resort for dementia according to age. 3C Study

Age	GP	specialist
	%	%
65-74	69,1	46,4
75-79	69,1	31,7
80-84	63,5	30,7
85+	62,5	19,6

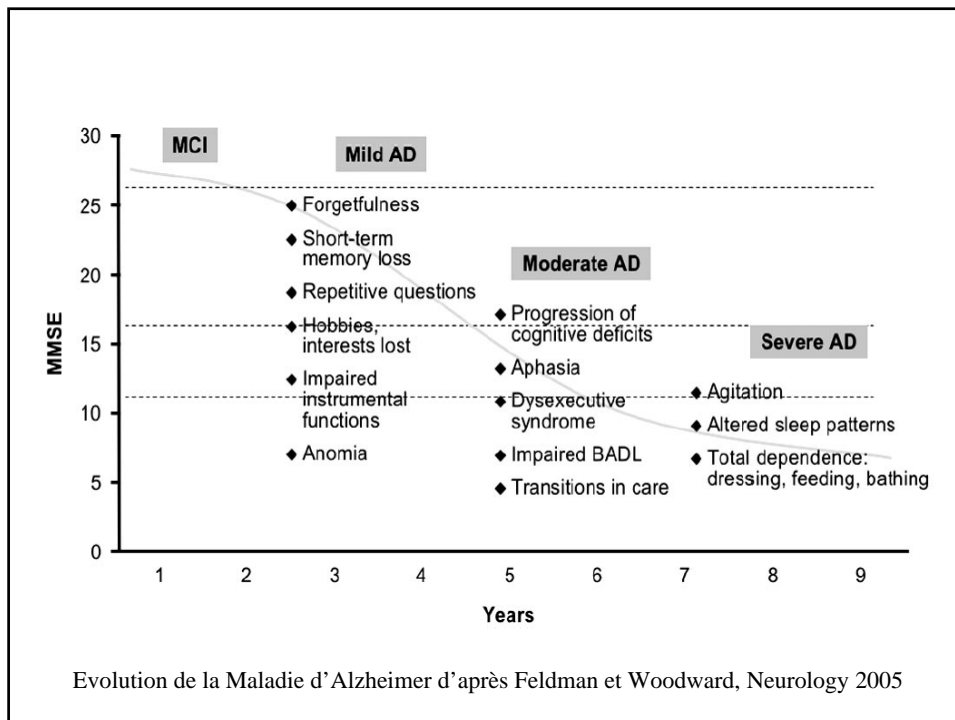
Détection de la maladie d'Alzheimer et de la démence (Lopponen et al, Age and Aging, 2004;32:606-612.

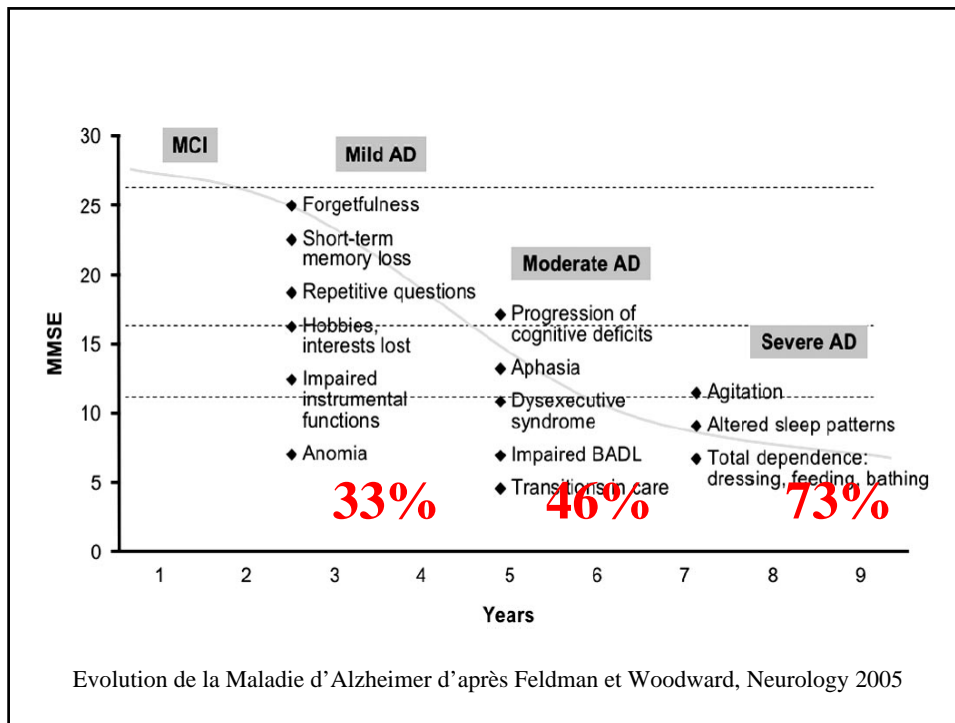
1260 sujets de plus de 65 ans habitant Licto (Finlande)

Diagnostic de démence connu	détecté par l'étude		
	OUI	NON	T
OUI	54	5	59
NON	58	1143	1201
T	112	1148	1260

SS = 48,2%; SP=99,6%; VPP=91,5%; VPN=95,6%

Prévalence : 8,9%





The PAQUID Study

- Objectives

- To study normal and pathological brain ageing
- To describe the loss of autonomy after 65 years

- Methods

Prospective cohort of:

- 3777 subjects living at home within the Gironde and Dordogne regions of France
- sample randomly selected from the electoral rolls in randomly sampled parishes
- follow-up performed every 1 to 3 years: up to 15 years

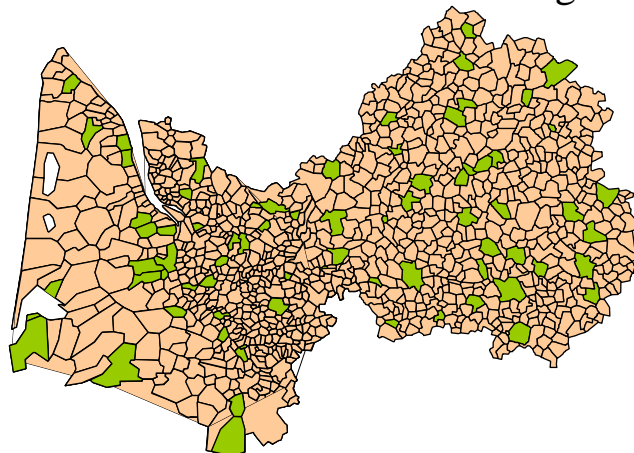
Specific aims of the study of brain aging

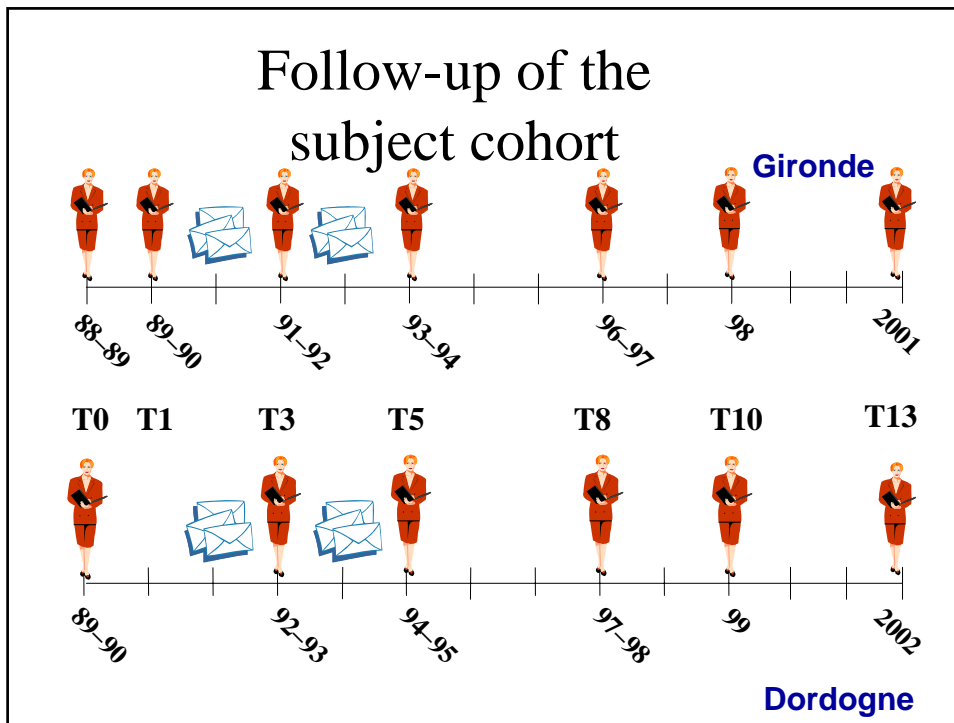
Aims of the Paquid study (1987):

- 1) descriptive epidemiology of dementia and Alzheimer's Disease
- 2) study of risk factors for dementia and AD
- 3) study of predictors of dementia and AD

The PAQUID Study: target population

- 75 communities in Gironde and Dordogne





Paquid : neuropsychological tests in the whole sample

Function	Test	T0	T3	T5	T8	T10
Global	MMSE	v	v	v	v	v
Visual memory	Benton VRT	v	v	v	v	v
Verbal fluency	Isaacs ST	v	v	v	v	v
Abstraction	W Similarities		v	v	v	v
Visuo-spatial Attention	Zazzo T	v			v	v
Simple Logical Reasoning	W Digit Symbol ST	v			v	v

Diagnosis of dementia

- **A two-stage strategy was used for diagnosis**
 - DSM III R criteria for dementia were completed by a psychologist at the end of an interview with the subject
 - A senior neurologist confirmed the diagnosis of dementia and its specific aetiology (Alzheimer, vascular or other) during a home visit to the subject, according to international criteria

Descriptive epidemiology of dementia

Prevalence of dementia according to age and gender

**N°2465, Homme, 80 ans, marié, vit à domicile, niveau
secondaire court, agent immobilier**

Test	0	1	3	5	8	10
Age	80	81	83	85	88	90
Plainte mnésique	1	1	2	1	2	2
MMS	29	28	24	26	27	23
Benton	14	13	11	11	12	11
Set test 15 sec	23	28	31	26	23	17
Temps Zazzo	67	74		74	70	127
Codes Wechsler	38	30		30	33	11
IADL						
Transport	1	1	1	1	4	
Budget	1	1	1	1	1	1
Médicament	1	1	1	1	1	1
Téléphone	1	1	1	1	1	1
CESD	11	5	9	8	3	20
DSM III R	0	0	0	0	0	1
Rosow	2	2	2	2	2	0
Mobilité	6	6	6	6	6	2
Maladie de Parkinson	0	0	0	1	1	1
Traitement	0	0	0	1	1	1

Prévalence en fonction de l'âge et du sexe

Age	Hommes (n=538)		Femmes (n=923)	
	Déments	Prévalence	Déments	Prévalence
75-79	20	7,7	20	5,7
80-84	17	12,5	38	16,6
85-89	24	22,9	64	29,9
90 et +	10	27,1	67	52,8
Total	71	13,2	189	20,5

Estimations

Gironde	Hommes	Femmes	Ensemble
75-79	1 562	1 695	3 257
80-84	982	2 253	3 235
85-89	1 413	4 374	5 787
90 et +	713	4 950	5 663
Total	4 670	13 272	17 942

France	Hommes	Femmes	Ensemble
75-79	67 374	73 175	140 549
80-84	41 707	96 392	138 099
85-89	65 194	190 417	255 611
90 et +	31 607	203 017	234 624
Total	205 882	563 001	768 883

Prévalence de la démence selon le mode d'hébergement

Mode d'hébergement	Déments	Effectif total	Prévalence
Domicile	157	1318	11,9
Institution	103	143	72,1
Total	260	1461	17,8

Age	Domicile (n=1318)		Institution (n=143)	
	Déments	Prévalence	Déments	Prévalence
75-79	32	5,3	8	61,5
80-84	35	10,5	20	64,5
85-89	53	19,5	35	74,5
90 et +	37	33,1	40	76,9
Total	157	11,9	103	72,1

Répartition des déments selon le score au MMS et le mode d'hébergement

Score au MMS	Domicile		Institution	
	Nb déments	%	Nb déments	%
MMS 0-9	21 (14,2%)	32,3	44 (43,6)	67,7
MMS 10-18	46 (31,1%)	56,1	36 (35,6)	43,9
MMS 19-23	61 (41,2%)	76,3	19 (18,8)	23,7
MMS 24-30	20 (13,5%)	90,9	2 (2,0)	9,1
Total	148 (100)	60,2	101 (100)	39,8

Descriptive epidemiology of dementia

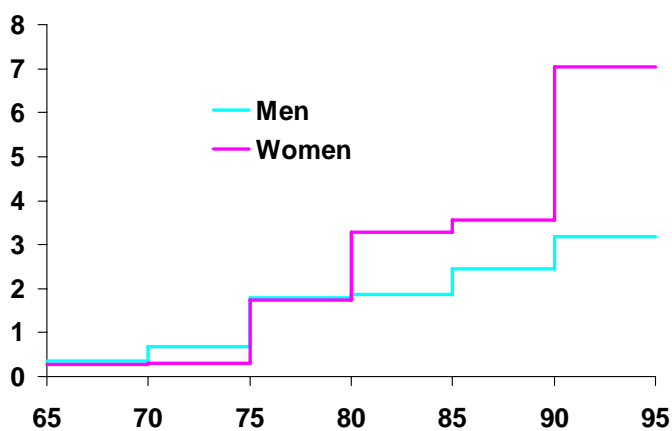
Incidence of dementia according to age and gender

After 13 years of follow-up...

	Men (%)	Women (%)	Total (%)
Death	939 (61,0)	1 038 (48,7)	1 977 (53,8)
Institution	113 (7,3)	342 (16,0)	455 (12,4)
Dementia	189 (12,3)	396 (18,6)	585 (15,9)
N	1 540 (100,0)	2 133 (100,0)	3 673 (100,0)

Age-specific incidence of dementia according to gender.

Person-years method



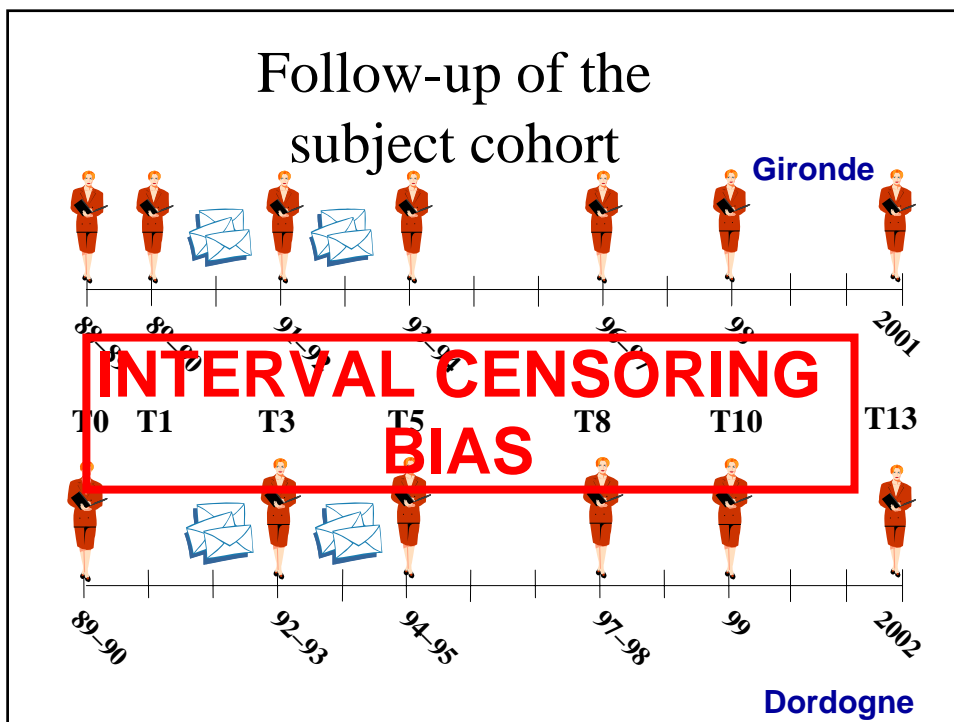
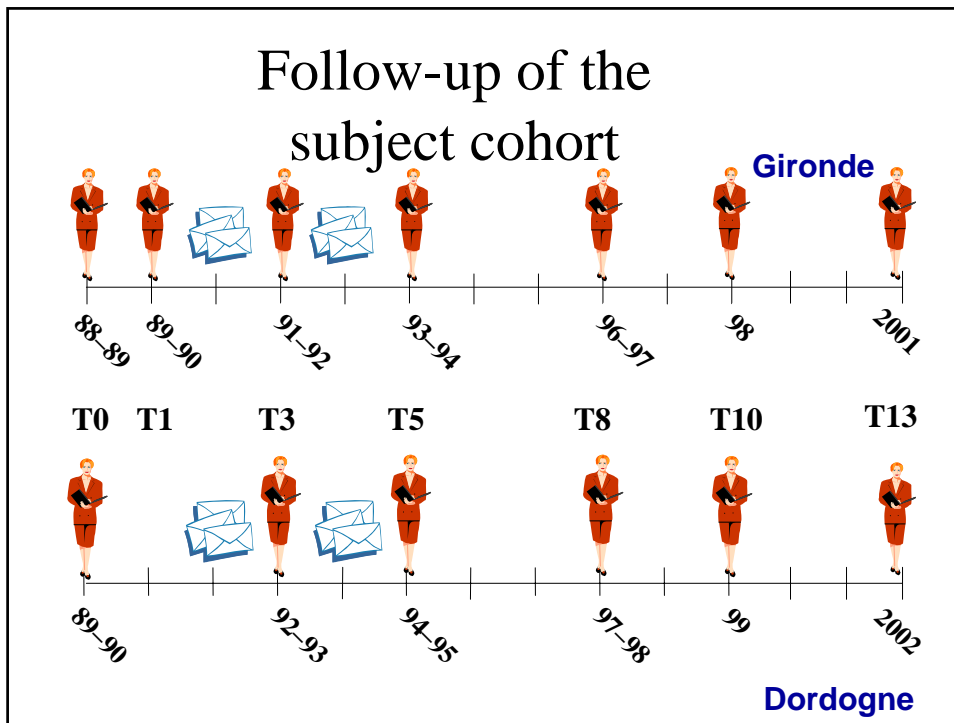
After 13 years of follow-up...

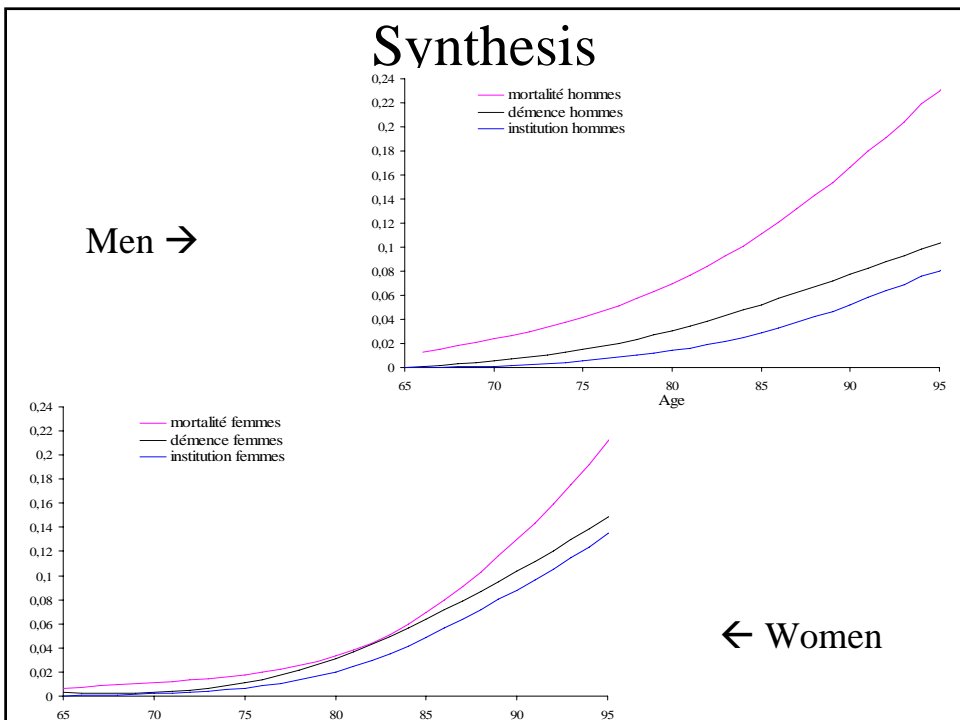
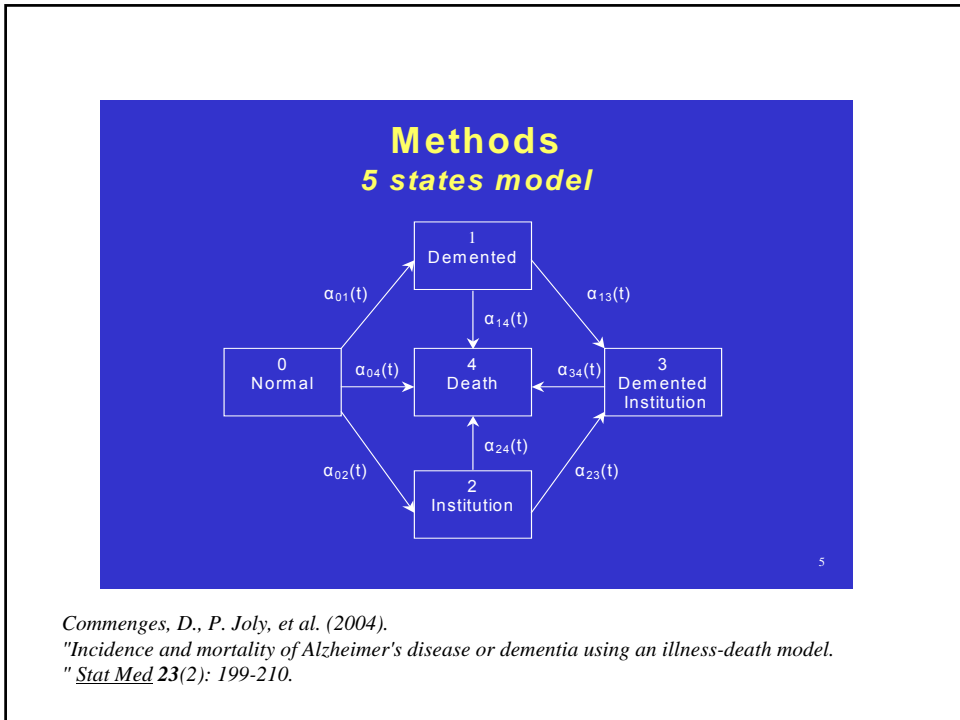
	Men (%)	Women (%)	Total (%)
Death	939 (61,0)	1 038 (48,7)	1 977 (53,8)
Institution	113 (7,3)	342 (16,0)	455 (12,4)
Dementia	189 (12,3)	396 (18,6)	585 (15,9)
N	1 540 (100,0)	2 133 (100,0)	3 673 (100,0)

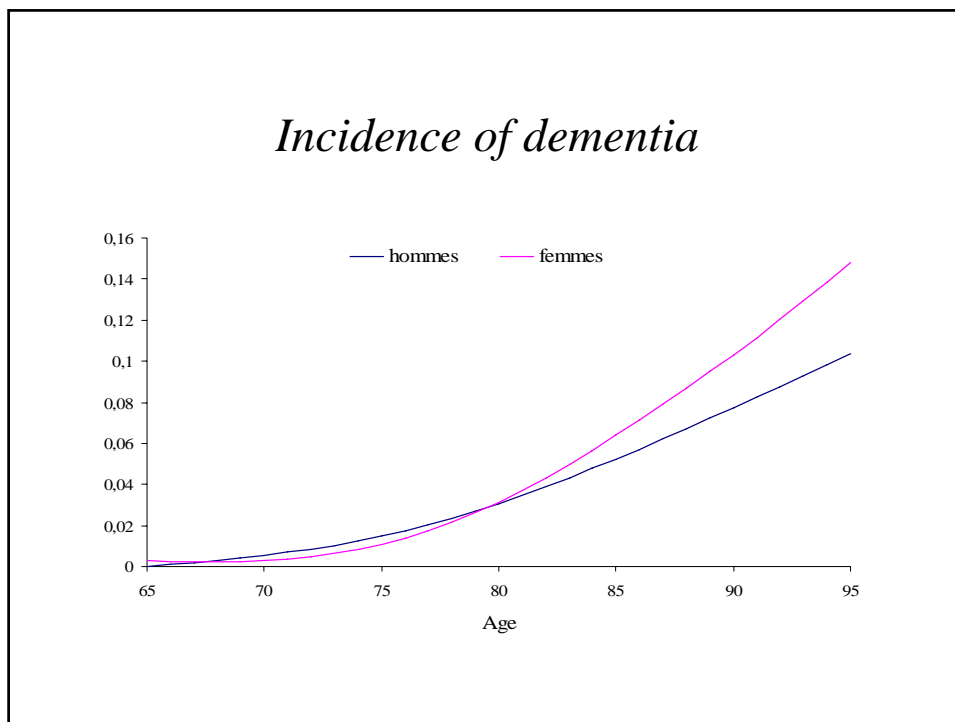
After 13 years of follow-up...

	Men (%)	Women (%)	Total (%)
Death	939 (61,0)	1 038 (48,7)	1 977 (53,8)
Institution	113 (7,3)	342 (16,0)	455 (12,4)
Dementia	189 (12,3)	396 (18,6)	585 (15,9)
N	1 540 (100,0)	2 133 (100,0)	3 673 (100,0)

**COMPETITIVE
MORBIDITY**







Expected versus observed number of events (Paquid study)

	MEN		WOMEN	
	Expected	Observed	Expected	Observed
Nb death	959	939	1 065	1 038
Nb diagnosed dementia	202	189	431	396
Nb demented	359	-	690	-
Nb institution	204	113	561	342
Age of death	82,85	82,94	86,13	86,20
Age of dementia	83,64	83,26	85,98	86,04

Comparison of estimations of the incidence of dementia by person-years method (Py) and by multistate model (Ms)

Age

Model	90	85	80	75	70
Py % men	3	2.5	2	1.5	0.5
Py % women	7	3.5	3	1.5	0.5
Ms % men	7	5	3	1.5	0.5
Ms % women	9	6	3	1.5	0.5

Table 2: Estimated life expectancy for subjects, healthy, in institution and/or with dementia, for women and men for different ages

Age	Women				Men			
	Healthy	Dem	In inst	Dem+Inst	Healthy	Dem	In inst	Dem+Inst
70	15.93	11.07	10.56	8.20	12.95	6.91	5.12	5.70
80	9.03	5.94	5.69	4.39	7.81	3.85	2.79	3.15
90	5.22	3.15	3.03	2.29	5.36	2.35	1.69	1.94

Table 2: Estimated life expectancy for subjects, healthy, in institution and/or with dementia, for women and men for different ages

Age	Women				Men			
	Healthy	Dem	In inst	Dem+Inst	Healthy	Dem	In inst	Dem+Inst
70	15.93	11.07	10.56	8.20	12.95	6.91	5.12	5.70
80	9.03	5.94	5.69	4.39	7.81	3.85	2.79	3.15
90	5.22	3.15	3.03	2.29	5.36	2.35	1.69	1.94

↔
1.4-1.6

↔
1.9-2.3

Table 2: Estimated life expectancy for subjects, healthy, in institution and/or with dementia, for women and men for different ages

Age	Women				Men			
	Healthy	Dem	In inst	Dem+Inst	Healthy	Dem	In inst	Dem+Inst
70	15.93	11.07	10.56	8.20	12.95	6.91	5.12	5.70
80	9.03	5.94	5.69	4.39	7.81	3.85	2.79	3.15
90	5.22	3.15	3.03	2.29	5.36	2.35	1.69	1.94

↔
1.4-1.6

↔
1.9-2.3

↔
1.5-1.7

↔
2.5-3.2

Table 2: Estimated life expectancy for subjects, healthy, in institution and/or with dementia, for women and men for different ages

Age	Women				Men			
	Healthy	Dem	In inst	Dem+Inst	Healthy	Dem	In inst	Dem+Inst
70	15.93	11.07	10.56	8.20	12.95	6.91	5.12	5.70
80	9.03	5.94	5.69	4.39	7.81	3.85	2.79	3.15
90	5.22	3.15	3.03	2.29	5.36	2.35	1.69	1.94

1.4-1.6

1.9-2.3

1.5-1.7

2.5-3.2

1.3-1.4

1.2-1.2

Conclusion

- Age, gender, severity of dementia and place of residence are major determinants of long term care in dementia, but methodological difficulties are important to estimate their real impact
- Multidisciplinary teams with clinicians, epidemiologists, biostatisticians, economists are necessary to conduct appropriate studies and to give valid estimations.