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Determinants of Unusual and Differential Health Expectancy

Session 6

Mortality and longevity

analysis of specific risk groups and risk factors

**Isolation as a risk factor for mortality: results from
the French HID mortality follow-up**

Cristina GIUDICI, Maria Felice AREZZO La Sapienza, University of Rome

Nicolas BROUARD Institut National d'Etudes Démographiques (INED)

The research

- estimating the strength of the association between health and survival
- evaluating the effect of family and social support on survival

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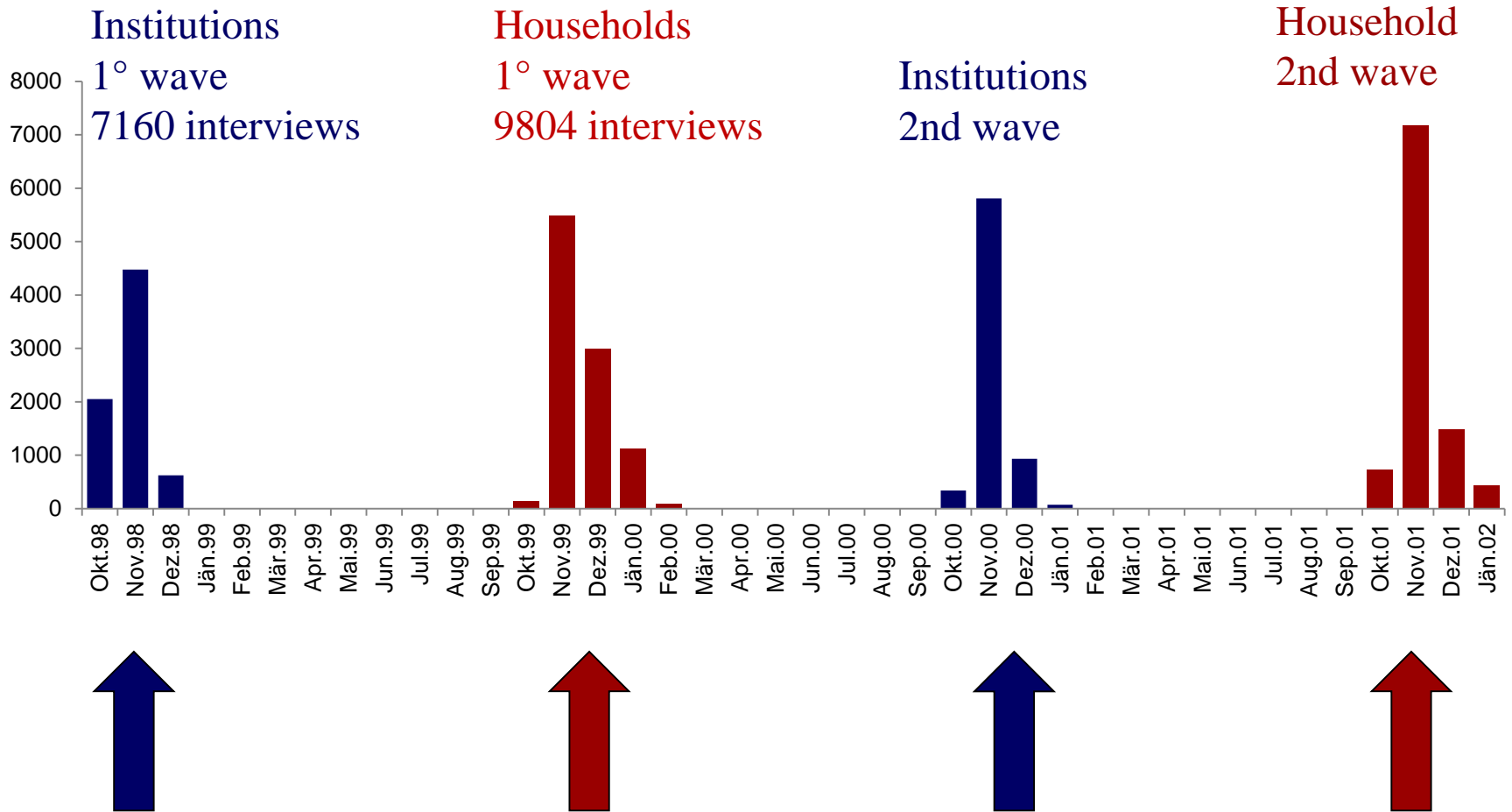
The methods

- Cox proportional hazards model
- Logistic analysis

The data

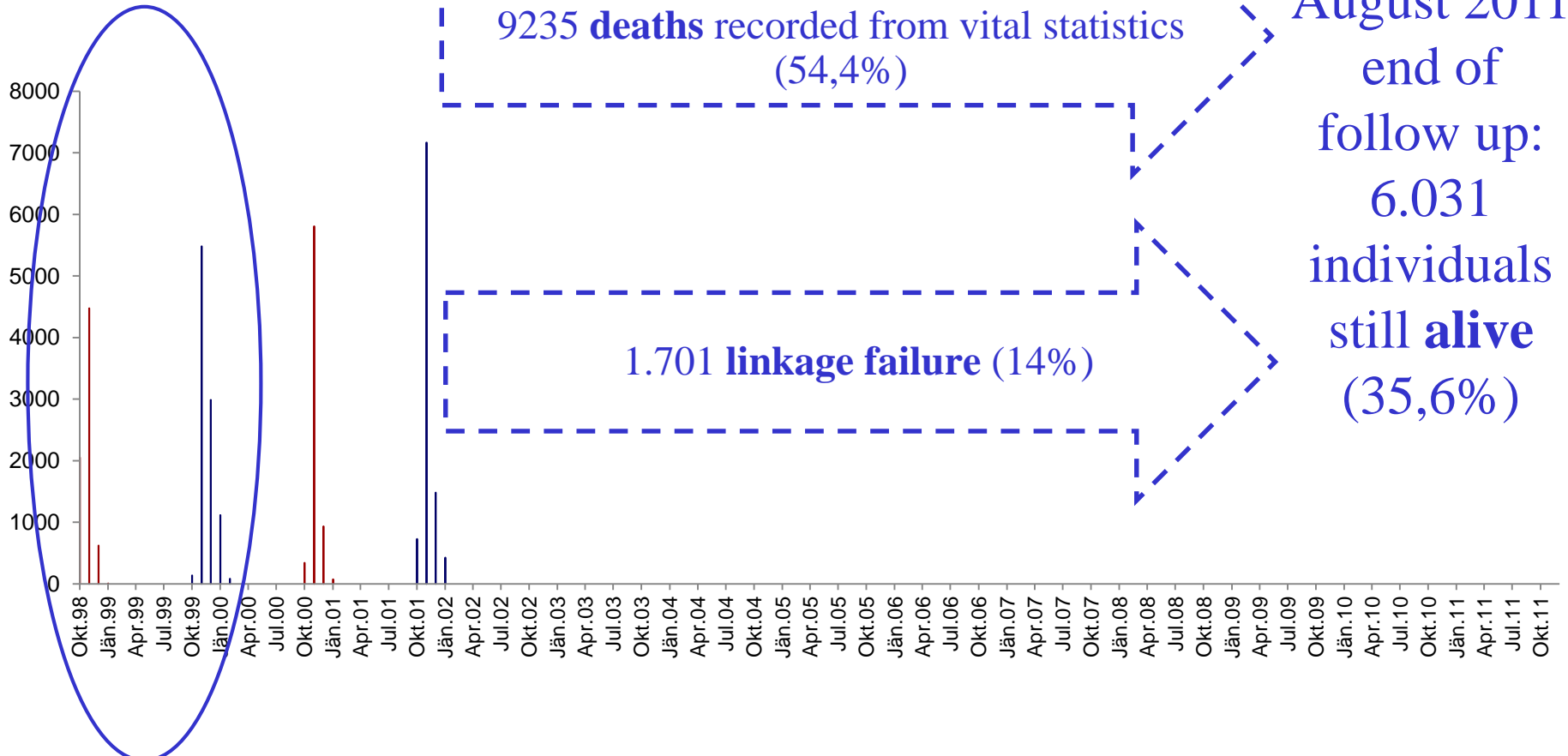
Mortality follow-up of the French National survey on handicaps, disabilities and dependency (HID) : Oct 1998 – June 2011

Data : the HID survey

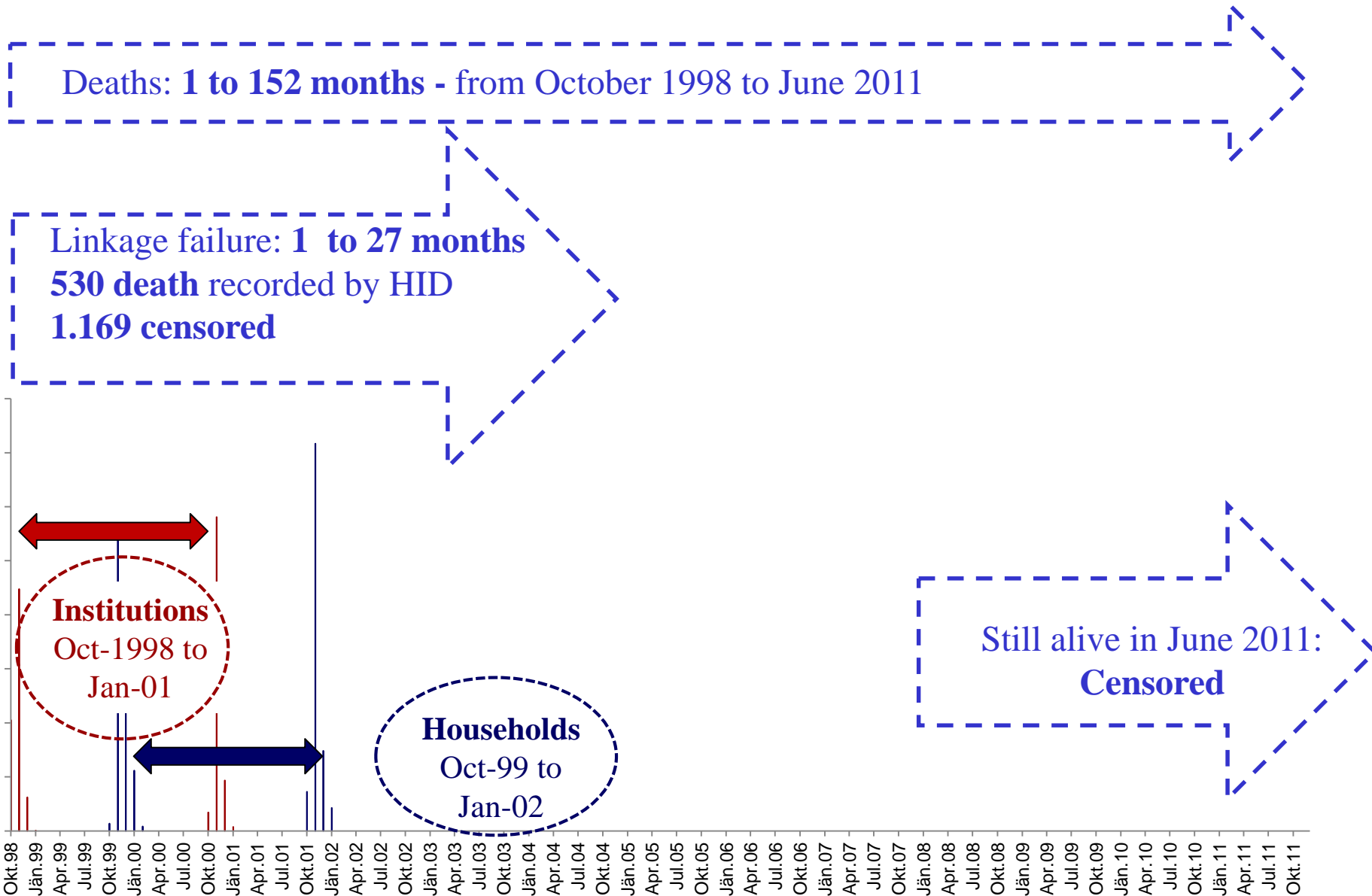


The linkage of HID with vital statistics

16964 interviews
between october 1998
and february 2000



The length of follow up and censoring

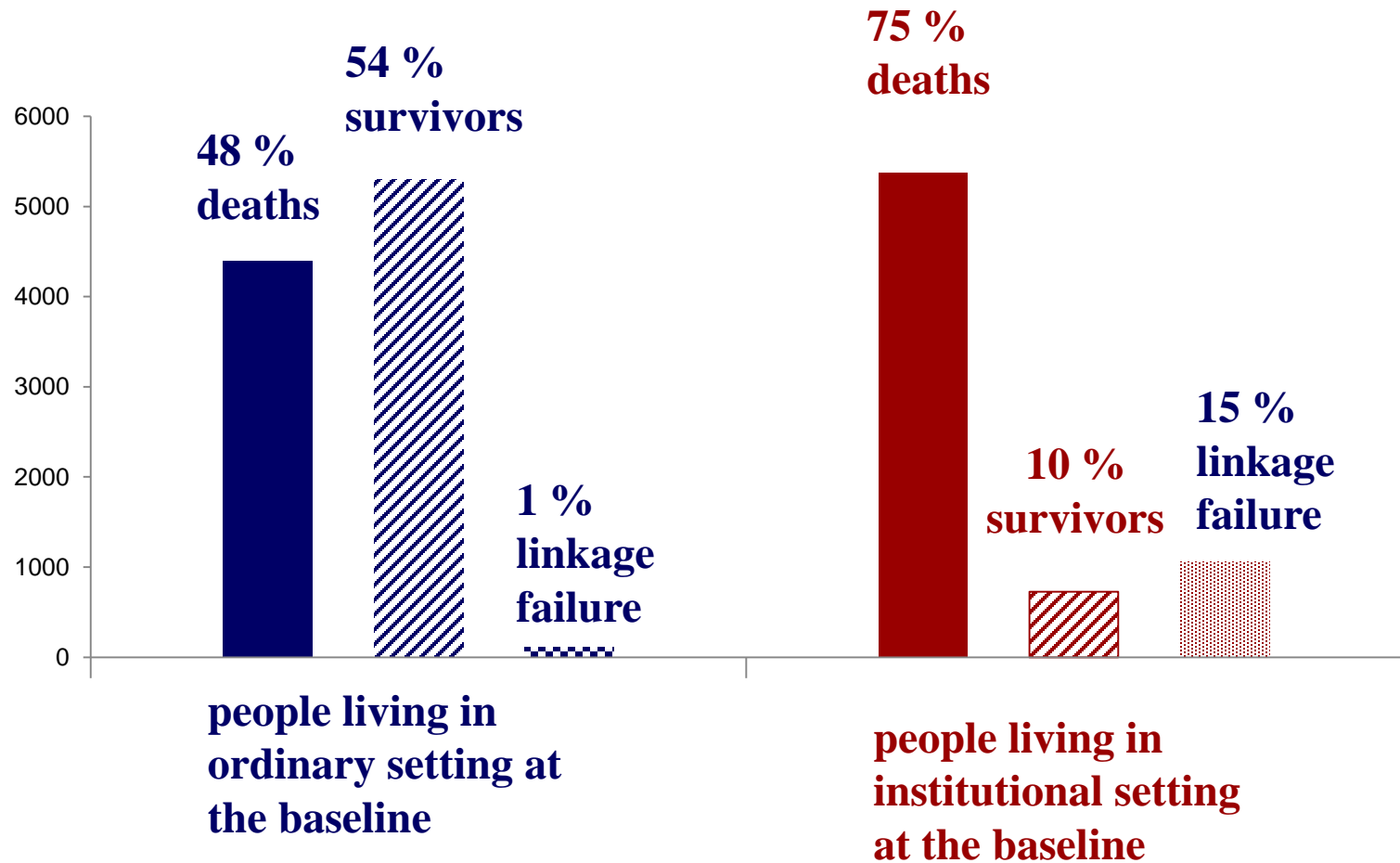


The sample Vital status at the end of follow up

	Censored		Dead		Total	
	Number	%	Number	%	Number	%
Gender						
Men (ref)	2110	38,9	2105	48,1	4215	43,0
Women	3315	61,1	2274	51,9	5589	57,0
Age						
55-70 (ref)	2759	50,9	850	19,4	3609	36,8
70-85	2539	46,8	2521	57,6	5060	51,6
85+	127	2,3	1008	23,0	1135	11,6
Marital status						
Married (ref)	3483	64,2	2233	51,0	5716	58,3
Single	384	7,1	304	6,9	688	7,0
Widowed	1167	21,5	1629	37,2	2796	28,5
Divorced	329	6,1	180	4,1	509	5,2
Separated	59	1,1	30	0,7	89	0,9
Number of children						
0 (ref)	700	12,9	717	16,4	1417	14,5
1	1029	19,0	958	21,9	1987	20,3
2+	3692	68,1	2693	61,7	6385	65,2
Number of siblings						
0 (ref)	1198	22,2	1562	35,9	2760	28,3
1	1417	26,3	1212	27,9	2629	27,0
2+	2781	51,5	1573	36,2	4354	44,7
Contacts with children or siblings						
yes (ref)	4396	82,4	3420	81,3	7816	81,9
Non	940	17,6	789	18,7	1729	18,1
Contacts with other family members, friends, colleagues etc.						
yes (ref)	4420	81,5	3496	79,9	7916	80,8
Non	1002	18,5	878	20,1	1880	19,2
ADL Disability						
No disability (ref)	3945	72,8	2414	55,1	6359	64,9
Moderate disability	1190	22,0	1156	26,4	2346	23,9
Severe disability	286	5,3	808	18,5	1094	11,2
Self rated health						
Good or very good (ref)	2405	47,5	1389	35,6	3794	42,4
Fair	1927	38,1	1566	40,2	3493	39,0
Bad or very bad	729	14,4	942	24,2	1671	18,7

Vital Status at the end of follow up

Globally 9.733 death are recorded (57%)



The mortality risks according to health status at interview

HID ménage Traditional Cox regression model

The effect of socio-demographic variable appear to be in accordance with the existing literature:

- women have lower mortality risk in respect to men
- advancing age strongly and positively affects the risk of dying
- widowhood is associated with higher risk of mortality
 - lower social positions show higher risk of dying
- ADL disability and poor self rated health act as strong independent predictor of mortality
- The family network size shows a protective effect, but an endogeneity issue emerges

Covariate	Coeff.		S.E.
Sex			
Men (ref)	0,00		
Women	-0,64	***	0,001
Age			
55-70 (ref)	0,00		
70-85	1,06	***	0,001
85+	2,08	***	0,002
Social condition of the head of household			
Ouvrier (ref)	0,00		
Agriculteurs exploitants	-0,19	***	0,002
Artisans, commerçants et chefs d'entreprise	-0,03	***	0,002
Cadres et professions intellectuelles supérieures	-0,24	***	0,002
Professions intermédiaires	0,05	***	0,002
Employés	-0,09	***	0,002
Autres personnes sans activité professionnelle	-0,80	***	0,015
Marital status			
Marié (ref)	0,00		
Célibataire	-0,10	***	0,003
Veuf(ve)	0,16	***	0,002
Divorcé(e)	0,01	***	0,003
Séparé(e) ou en cours de divorce	-0,30	***	0,007
Number of persons in the household			
1 (ref)	0,00		
2+	-0,27	***	0,002
Number of children			
0 (ref)	0,00		
1	-0,14	***	0,002
2+	-0,20	***	0,002
Number of siblings			
0 (ref)	0,00		
1	-0,20	***	0,001
2+	-0,35	***	0,001
Contacts with children or siblings			
yes (ref)	0,00		
Non	-0,10	***	0,001
Contacts with other family members, friends, colleagues etc.			
yes (ref)	0,00		
Non	-0,02	***	0,001
ADL Disability			
No disability (ref)	0,00		
Moderate disability	0,26	***	0,001
Severe disability	0,80	***	0,002
Self rated health			
Good or very good (ref)	0,00		
Fair	0,42	***	0,001
Bad or very bad	0,71	***	0,002

Dealing with non proportionality extended Cox regression model HID Ménage

We include interaction with time for covariate with non proportional effects on mortality:

age and **self rated health** have positive significant interaction with time : the effect on mortality becomes stronger year after year;

disability has a negative significant interaction with time : the strenght of the association with mortality is higher in the first years of follow up and the diminishes over time;

Main effects			
Covariate	Coeff.		S.E.
Age			
55-70 (ref)	0,00		
70-85	-0,05	***	0,002
85+	0,03	***	0,003
ADL Disability			
No disability (ref)	0,00		
Moderate disability	0,73	***	0,003
Severe disability	1,70	***	0,006
Self rated health			
Good or very good (ref)	0,00		
Fair	0,23	***	0,002
Bad or very bd	0,39	***	0,004
Interaction with time			
Age	0,02	***	0,0004
ADL Disability	-0,13	***	0,0008
Self-rated health	0,0226	***	0,00003

level of significance: *** p < 0,001

Hid – Institutions: Coefficients estimated from the traditional and the extended Cox regression model

Traditional model				Extended model			
Covariate	Coeff.	***	S.E.	Covariate	Coeff.	***	S.E.
Sex				Sex			
Men (ref)	0,00			Men (ref)	0,00		
Women	-0,54	***	0,001	Women	-0,57	***	0,006
Age				Age			
55-70 (ref)	0,00			55-70 (ref)	0,00		
70-85	0,86	***	0,009	70-85	0,25	***	0,012
85+	1,36	***	0,010	85+	0,36	***	0,016
Mearital status				Mearital status			
Marié (ref)	0,00			Marié (ref)	0,00		
Célibataire	-0,36	***	0,011	Célibataire	-0,33	***	0,011
Veuf(ve)	0,08	***	0,009	Veuf(ve)	0,03	***	0,009
Divorcé(e)	-0,04	***	0,012	Divorcé(e)	-0,03	***	0,012
Séparé(e) ou en cours de divorce	-0,07	**	0,026	Séparé(e) ou en cours de divorce	0,00	**	0,026
Number if children				Number if children			
0 (ref)	0,00			0 (ref)	0,00		
1	-0,09	***	0,008	1	-0,07	***	0,008
2+	-0,002		0,008	2+	0,02		0,008
Number of siblings				Number of siblings			
0 (ref)	0,00			0 (ref)	0,00		
1	-0,05	***	0,006	1	-0,02	***	0,006
2+	-0,13	***	0,006	2+	-0,09	***	0,006
Contacts with childrens or siblings				Contacts with childrens or siblings			
yes (ref)	0,00			yes (ref)	0,00		
Non	-0,11	***	0,007	Non	-0,11	***	0,007
Contacts with other family members, friends, colleagues etc.				Contacts with other family members, friends, colleagues etc.			
yes (ref)	0,00			yes (ref)	0,00		
Non	0,06	***	0,005	Non	0,07	***	0,005
ADL Disability				ADL Disability			
No disability (ref)	0,00			No disability (ref)	0,00		
Moderate disability	0,14	***	0,007	Moderate disability	0,49	***	0,012
Severe disability	0,48	***	0,006	Severe disability	1,18	***	0,019
Self rated health				Self rated health			
Good or very good (ref)	0,00			Good or very good (ref)	0,00		
Fair	0,14	***	0,006	Fair	0,19	***	0,006
Bad or very bd	0,25	***	0,005	Bad or very bd	0,34	***	0,005
Interaction with time							
Age					0,01	***	0,000
ADL Disability					-0,10	***	0,003
Self-rated health					-0,01	***	0,002

level of significance: *** p < 0,001 ** p < 0,01

Looking at the last years of life: the «proximity to death» perspective

Logistic analysis of the last two years of life

Covariate	Odds ratio estimates	95% wald Confidence Limits	
Sex			
Men (ref)	-		
Women	0,67	0,65	0,68
Age			
55-70 (ref)	-		
70-85	1,73	1,67	1,79
85+	2,51	2,42	2,60
Marital status			
Marié (ref)	-		
Célibataire	0,53	0,51	0,55
Veuf(ve)	1,09	1,05	1,12
Divorcé(e)	0,75	0,72	0,79
Séparé(e) ou en cours de divorce	1,09	1,00	1,20
Number if children			
0 (ref)	0,00		
1	1,04	1,01	1,07
2+	0,95	0,92	0,97
Number of siblings			
0 (ref)	0,00		
1	1,01	0,99	1,03
2+	0,82	0,80	0,84
Contacts with childrens or siblings			
yes (ref)	0,00		
Non	1,31	1,28	1,35
Contacts with other family members, friends, etc.			
yes (ref)	0,00		
Non	1,13	1,11	1,15
ADL Disability			
No disability (ref)	-		
Moderate disability	1,07	1,04	1,10
Severe disability	1,84	1,80	1,88
Self rated health			
Good or very good (ref)	-		
Fair	1,39	1,36	1,42
Bad or very bad	1,12	1,10	1,15

Conclusions

- The HID follow up allows to explore the association between health and mortality in France, taking into account the social and relational context
- Poor health considerably reduces the chances of survival, but seems to be concentrated in the last years before death
- The analysis confirm the protective effect of relational life on mortality

and further developments

- Adding time dependent covariates;
- Accomodating cluster structure while allowing for cluster-specific covariates (Silvia Polettini);
- Comparing results with similar follow up in Europe (Elena Demuru, 2015)
- Verifying the possibility to explore causes of death

Thank you !