

Frailty and Healthy Ageing Strategies

Which Role for Social Policy?

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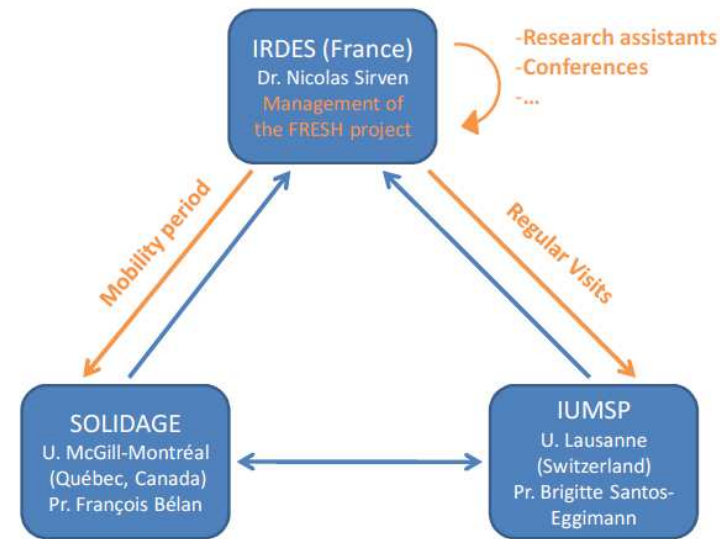
Overview of the FRESH project

Summary

The **FRESH project** (Frailty Research in Economics, Society, and Health) aims to promote a new and comprehensive approach to analyse dependency in old-age. Frailty depicts a state of **vulnerability** to adverse health outcomes within a **disablement process**. Some individuals become **frail**, which means that the same health shocks from which non-frail individuals recover can have lasting consequences on them, **starting a process of functional disability and dependence**. Moving back from dependency into autonomy can be almost impossible and the process can therefore be described as a **disability trap**. Since the **costs of dependency** are very high, it is important to look for ways to **prevent such a process and protect frail individuals** from potentially harmful health shocks.

Adapting tools from vulnerability analysis in **development economics**, the FRESH project's objectives are two-fold: the first one is **to develop an economic framework** for studying the concept, measures and costs of frailty; the second one is to identify the **determinants of frailty in the general population**. The FRESH project relies on previous work using SHARE data that developed and validated a medical-based frailty instrument, where frailty is considered as a **reversible precursor of functional dependency**. Extension to the cognitive dimension and exploration of the individual characteristics (**social and economic variables in panel data and life histories settings**) and **system features** (social security, etc.) in a **cross-country** setting are promising ways of research.

Organisation



- FRESH project, funded by FLARE
- International initiative on Frailty, funded by other sources

Time period

October 2011 – September 2014



FRESH
Frailty Research
Economics Society and Health



Rationale for Phase 1

1. Population ageing puts tension on EU Welfare States regimes

Two major economic issues for Social Protection Systems

- **Financing** [Pensions]: \nearrow retirement age + [LTC]: individual (compulsory) insurance at 50+
- **Funding** Decline in cognitive + physiologic reserve \rightarrow Focus on prevention/ health promotion

2. Development of strategies to promote autonomy

“Ex-ante” strategies refer to the concept of **Physical Frailty** (Fried et al, 2001)

- Predicts negative outcomes (falls, disability, dependency, hospitalisation, institutionalisation, death)
- Allows for reversible pathways \rightarrow Frailty = **Vulnerability** to health shocks (=Risk/Coping capacity)

3. Medical hegemony

The use of the frailty concept dedicates an important role to the medical approach

- **Geriatrics/Gerontology**: Generalised prevention – Frailty as geriatric syndrom (indiv. marker)
- **Public health**: General health promotion – Frailty as health marker in the general population

4. Is there room for social policy?

Contribution: On the socio-economic determinants of the frailty process (stocks & flows)

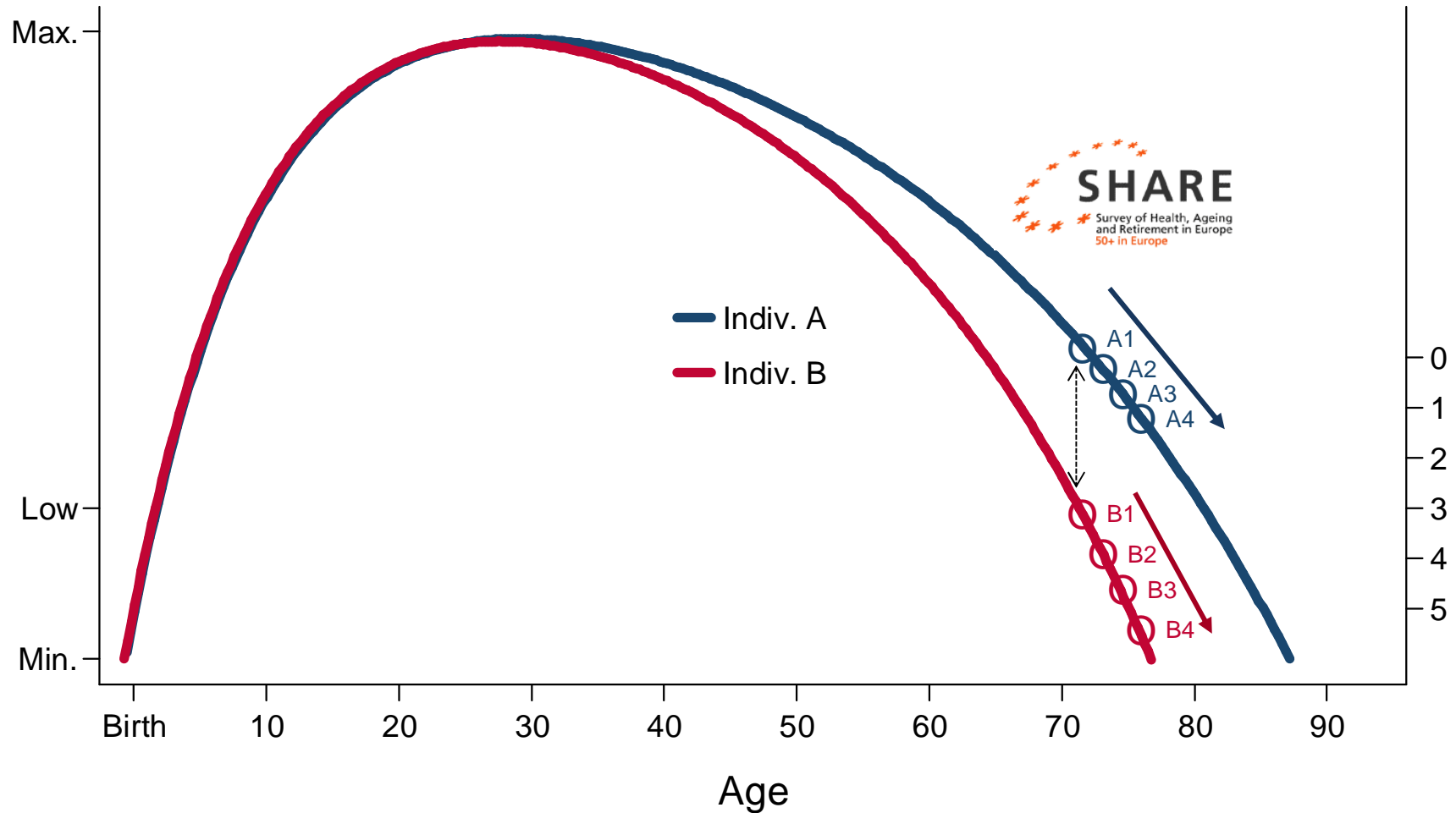
Method: Panel models using individual survey data from SHARE www.share-project.org

Concepts & measures

Individuals' physiologic reserve

Theoretical reserve
 $f(x) = \alpha(1 - e^{-\beta x}) - \gamma e^{\delta x}$

Frailty index



□ The 3 pillars of SHARE

1. Ageing is a dynamic phenomenon

- **Panel data:** initial cohort = 20,000 household \supset at least 1 member aged 50+
- 4 waves (2004, 2006, 2008, 2010)
- Wave 3 SHARELIFE = retrospective data (life-history)

2. Ageing affects all domains of life

- Health: objective & declared, physical, mental, cognition, health care,
- Social & family life: social networks, household demography, children,
- Living conditions: work, retirement, income, assets, transfers, etc.

3. Population ageing is a global trend

- International comparisons help understand the role of institutions (e.g. SPS)
- HRS (USA) & ESLA (UK) are comparable previous surveys
- Other 'sister' survey around the world (Asia, Brazil, Canada, etc.)

The data

country identifier	SHARE Panel data (+ refresher)		SHARELIFE Retrospective Life-history data	Available Nov. 2012	Total
	1	2	3	4	
Austria	1,893	1,341	879	3,924	8,037
Germany	3,008	2,568	1,915	2,567	10,058
Sweden	3,053	2,745	1,986	1,668	9,452
Netherlands	2,979	2,661	2,286	2,493	10,419
Spain	2,396	2,228	2,163	3,184	9,971
Italy	2,559	2,983	2,580	3,309	11,431
France	3,193	2,968	2,587	5,558	14,306
Denmark	1,707	2,616	2,225	2,175	8,723
Greece	2,898	3,243	3,096	0	9,237
Switzerland	1,004	1,462	1,320	3,352	7,138
Belgium	3,827	3,169	2,928	5,080	15,004
Israel	2,598	0	0	0	2,598
Czechia	0	2,830	1,937	5,890	10,657
Poland	0	2,467	2,006	0	4,473
Ireland	0	1,134	0	0	1,134
Hungary	0	0	0	2,976	2,976
Portugal	0	0	0	1,799	1,799
Slovenia	0	0	0	2,739	2,739
Estonia	0	0	0	6,828	6,828
Total	31,115	34,415	27,908	53,542	146,980

1. Measures of frailty in SHARE (Santos-Eggimann et al., 2009; Fried et al., 2001)

Shrinking

- What has your appetite been like? (diminution in desire for food/other)
- So have you been eating more or less than usual? (less/other)

Exhaustion

- In the last month, have you had too little energy to do things you wanted to do? (yes/no).

Slowness

- Because of a health problem, do you have difficulty [expected to last more than 3 months] "walking 100 meters"
- or " ... climbing one flight of stairs without resting " (yes/no).

Low activity

- How often do you engage in activities that require a low or moderate level of energy such as gardening, cleaning the car, or going for a walk? ('one to three times a month' or 'hardly ever or never'/other)

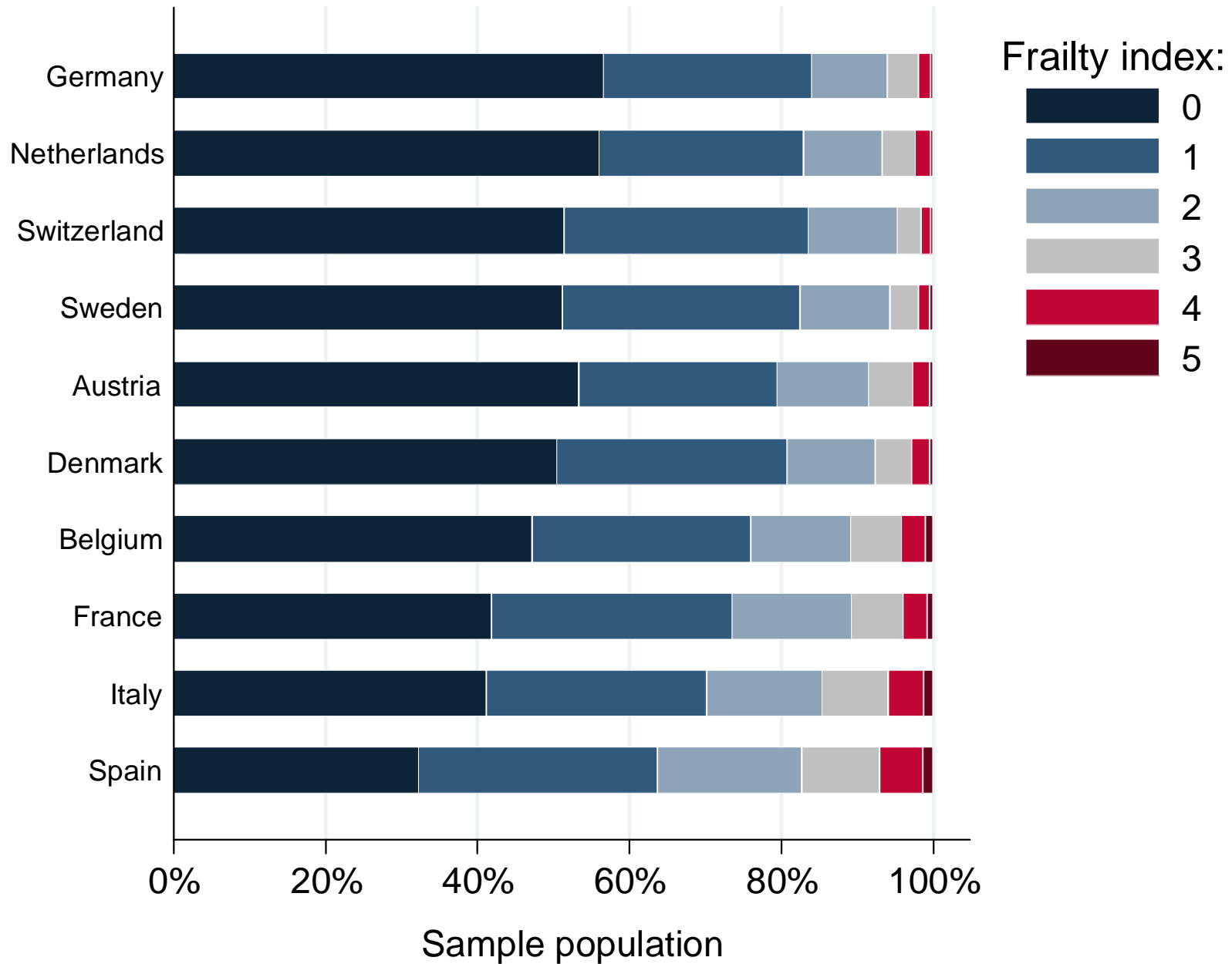
Weakness

- derived from the highest of four consecutive dynamometer measurements of handgrip strength (two from each hand), applying gender and body mass index cut-offs by quintiles of the distribution

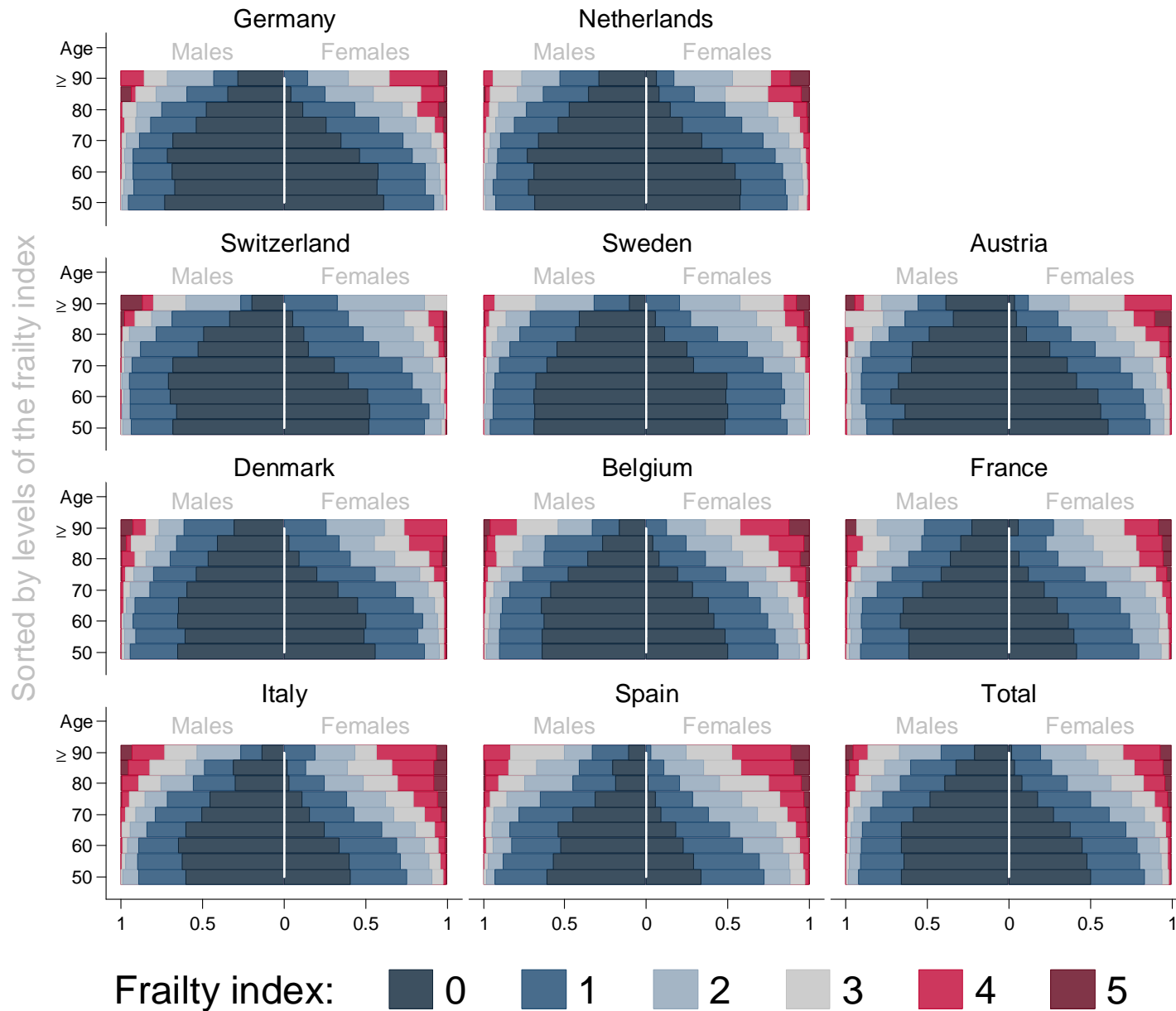
2. The frailty index

- Standard: [0] = Non-frail ; [1-3] = Pre-frail; [4-5] Frail
- Ours: keep it a count variable – each domain gives 1 count, range [0-5]

Frailty index



Frailty index



□ Research question

'Mind the gap'

- Social & econ. determinants of individual differences in **frailty levels**
- Individual + cross-country comparisons (macro-series from Eurostat)
- Special focus on **life-history** (SHARELIFE, wave 3)

'The slippery slope'

- Social & econ. determinants individual differences in **frailty dynamics**
- Focus on variables that are relevant for social policy:
- Poverty, housing, social isolation

□ **Panel data model** (10 countries, 3 periods)

Initially: 2 panel-data models for 2 research questions

- Random Effect (RE) model for differences in Frailty levels ('gap')
- Fixed Effects (FE) model for differences in Frailty dynamics ('slope')

/!\ RE is biased (Hausman test)

→ How to account for differences in Frailty levels?

Refined: 1 fits-all-model for 2 research questions

- Mundlak specification of RE panel-data model
- Between & within estimators are decomposed in RE model
- Allows for (1) 'Gap & Slope' simultaneous analysis +
(2) unbalanced panel samples

Notice: Time dummies help control for wave 3 & variations in data collection

□ **Model Specification**

Dependant variable

- Frailty index: 6 items count variable
- Poisson (alt. Neg.-Bin.) RE model with Mundlak specification

Independent variables

- Time-variant (dynamic) = Variables which are relevant for social policy:
 - Income support (Household able to make ends meet)
 - Housing adaptation (Expenses in mobility devices for autonomy)
 - Reducing social isolation (widowhood, social participation)
- Time-invariant
 - (1) usual confounders: age, gender, migrant, education, country
 - (2) life-history: health (childhood + adult life), periods of financial hardship, job loss history, parents health-related behaviour

Results: 'Slope'

Panel models for Poisson

Count Dep. Var.
(6 categories)

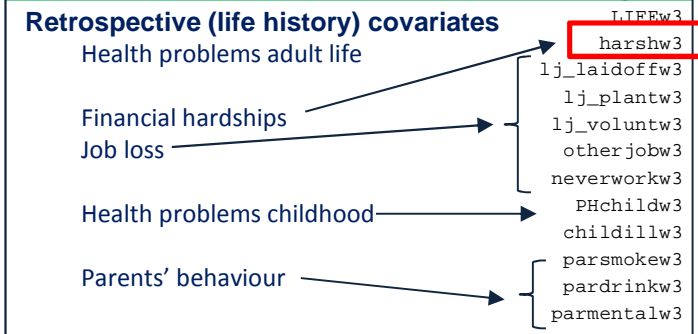
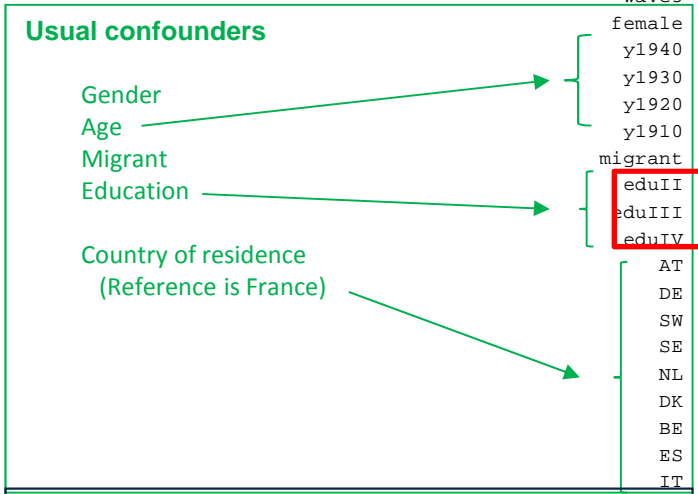
Variable	Fixed effects 1	Fixed effects 2	RE - Mundlak 1	RE - Mundlak 2
frail				
Social Policy Targets				
1. Poverty → makends_2	-0.066***	-0.068***	-0.065**	-0.067**
2. Housing safety → makends_3	-0.095***	-0.094***	-0.086**	-0.089***
makends_4	-0.112***	-0.108***	-0.101***	-0.102***
3. Social isolation → housefeat	0.063	0.059	0.100	0.095
separ2y	0.156***	0.157***	0.150***	0.151***
doasso	-0.067***	-0.070***	-0.064***	-0.066***
dosport	-0.095***	-0.096***	-0.098***	-0.100***
Controls				
1. "Healthy Worker Effect" → emplo1	0.094***		0.073**	0.079**
2. Time variations → wave2	0.083***	0.108***	0.074***	0.056***
wave3	0.381***	0.401***	0.324***	0.332***
Decomp. of emplo1				
Miss work >20 days → abs_m_w1		0.169***		
abs_0_		-0.062		
abs_less20		0.040		
abs_20more		0.297***		
_cons			0.538***	0.496***
lnalpha				
_cons			-2.502***	-0.794***
Statistics				
N	25155	25155	25155	38370
N_g	10006	10006	10006	17288

legend: * p<.1; ** p<.05; *** p<.01

Results: 'Gap & Slope'

Social inequalities explain differences in Frailty dynamics →

Variable	Fixed effects 1	RE - Mundlak 1	RE - Mundlak 2	RE - Mundlak 3	RE - Mundlak 4
makends_2	-0.066***	-0.065**	-0.067**	-0.068**	-0.068**
makends_3	-0.095***	-0.086**	-0.089***	-0.090***	-0.090***
makends_4	-0.112***	-0.101***	-0.102***	-0.103***	-0.103***
housefeat	0.063	0.100	0.095	0.087	0.086
separ2y	0.156***	0.150***	0.151***	0.152***	0.154***
doasso	-0.067***	-0.064***	-0.066***	-0.069***	-0.070***
dosport	-0.095***	-0.098***	-0.100***	-0.103***	-0.103***
empl01	0.094***	0.073**	0.079**	0.079**	0.080**
wave2	0.083***	0.074***	0.056***	0.070***	0.073***
wave3	0.381***	0.324***	0.332***	0.347***	0.349***
female				0.622***	0.625***
y1940				-0.028	-0.001
y1930				0.223***	0.263***
y1920				0.628***	0.651***
y1910				0.883***	0.907***
migrant				0.091***	0.090***
eduII				-0.067***	-0.055***
eduIII				-0.079***	-0.059***
eduIV				0.053	0.058
AT				-0.174***	-0.173***
DE				-0.248***	-0.253***
SW				-0.206***	-0.201***
SE				-0.161***	-0.236***
NL				-0.199***	-0.223***
DK				0.045	-0.027
BE				-0.018	-0.063**
ES				0.071**	0.062**
IT				-0.076***	-0.070**
LIFEW3					0.368***
harshw3					0.061***
Health problems adult life					0.017
lj_laidoffw3					-0.052*
lj_plantw3					-0.089***
lj_voluntw3					-0.038
otherjobw3					(omitted)
neverworkw3					-0.174**
PHchildw3					0.134***
childillw3					0.001
parsmokew3					0.104***
pardrinkw3					0.078*
parentalw3					
N	25155	25155	38370	38370	38370
N_g	10006	10006	17288	17288	17288



Social inequalities explain differences in Frailty levels

legend: * p<.1; ** p<.05; *** p<.01

Conclusion of Phase 1

1. Evidence of social inequalities in frailty levels & dynamics ('gap & slope')

- Standard soc. ineq. like with any other health outcome (\exists gradient in health, e.g. education)
- Specific influence of **economic shocks** (financial hardships)
- Time-causal influence of financial difficulties on frailty (non displayed here)
- Exploratory "Social development" effect at the **macro-level** (non displayed here)

2. Other determinants of Frailty?

- **At work:** some aged workers experience rapid increase in frailty in few years (\neq HWE)
- **At home:** adaptation of the house does not follow the frailty process
- **All life long:** Frailty "comes from far back"

Life-time events: (initial) childhood health + (later) health shocks

Time invariant effects, especially gender

3. Social policy and frailty reduction

Legitimacy of SP for protection against health | economic shocks

- Income maintenance and support (widowed) **to delay & accompany the frailty process**
- Efforts to be done in: home safety + coordination with LFP strategies