Disentangling demographic and non-demographic drivers of health spending: a possible methodology and data requirements

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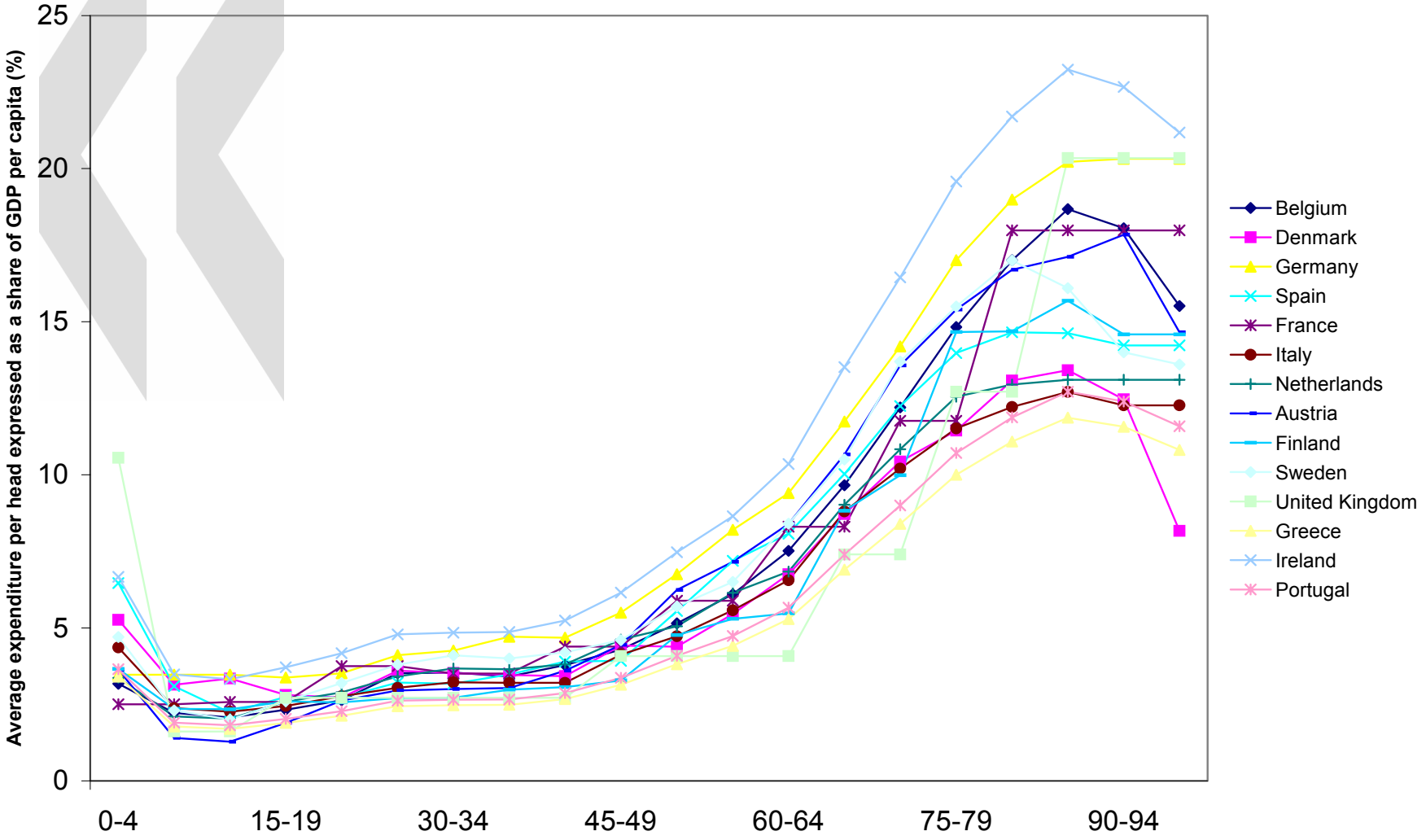
Context and outline

- In the follow-up of the 2001 Joint EC/OECD Project on Social Expenditure Projections, the OECD Economics Department decided to carry out another round of projections (2005-2050) focusing on non-demographic drivers of health care expenditures.

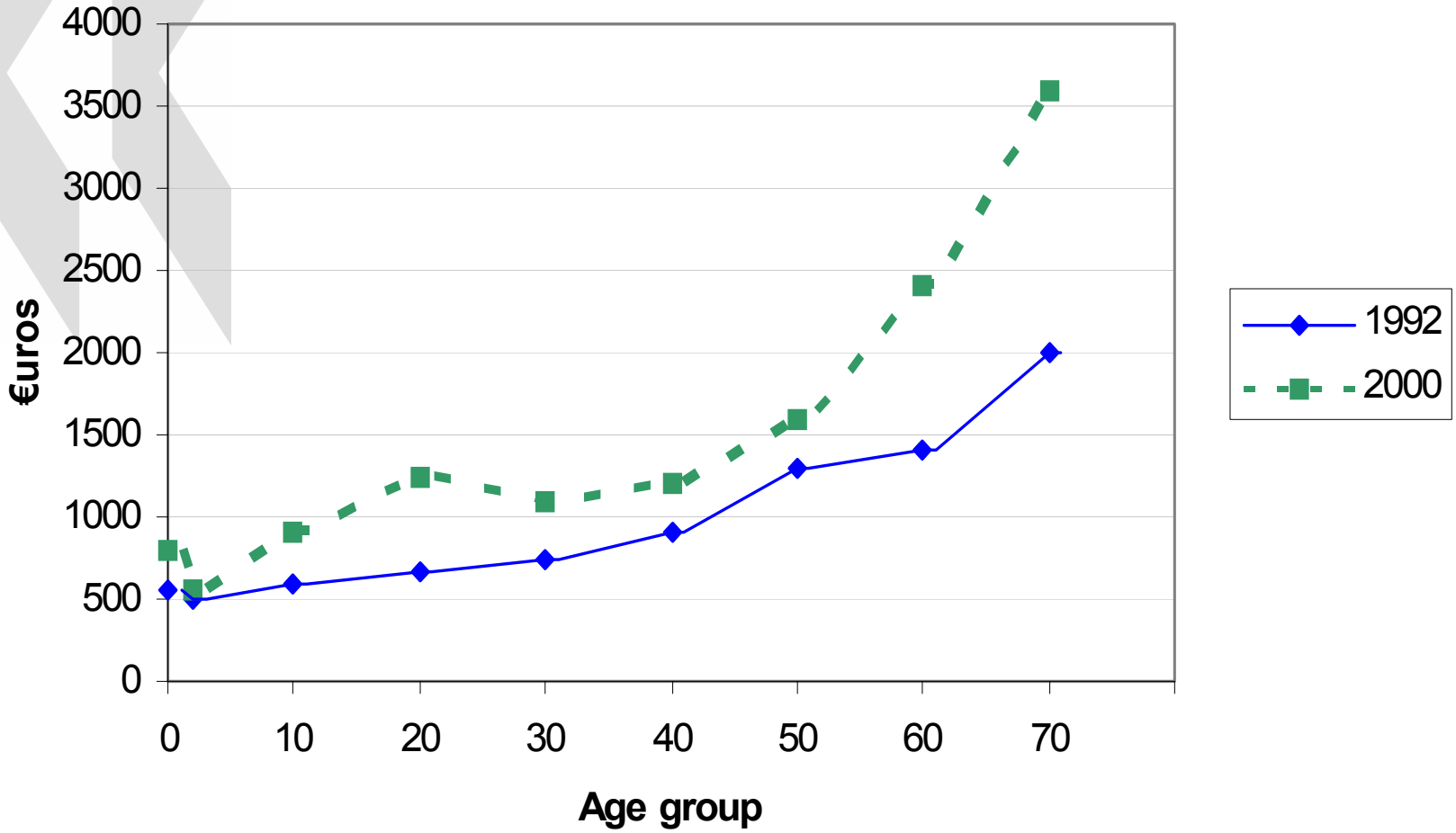
- Outline:
  1) Framework: profiles of health expenditures by age groups
  2) How to disentangle demographic from non-demographic effects (demand, technology/relative prices)
  3) Estimation of expenditure drivers over the period 1981-2002
  4) Illustrative expenditure projections 2005-2050
  5) Further work

The projection framework is based on the health care expenditure profiles by age-groups



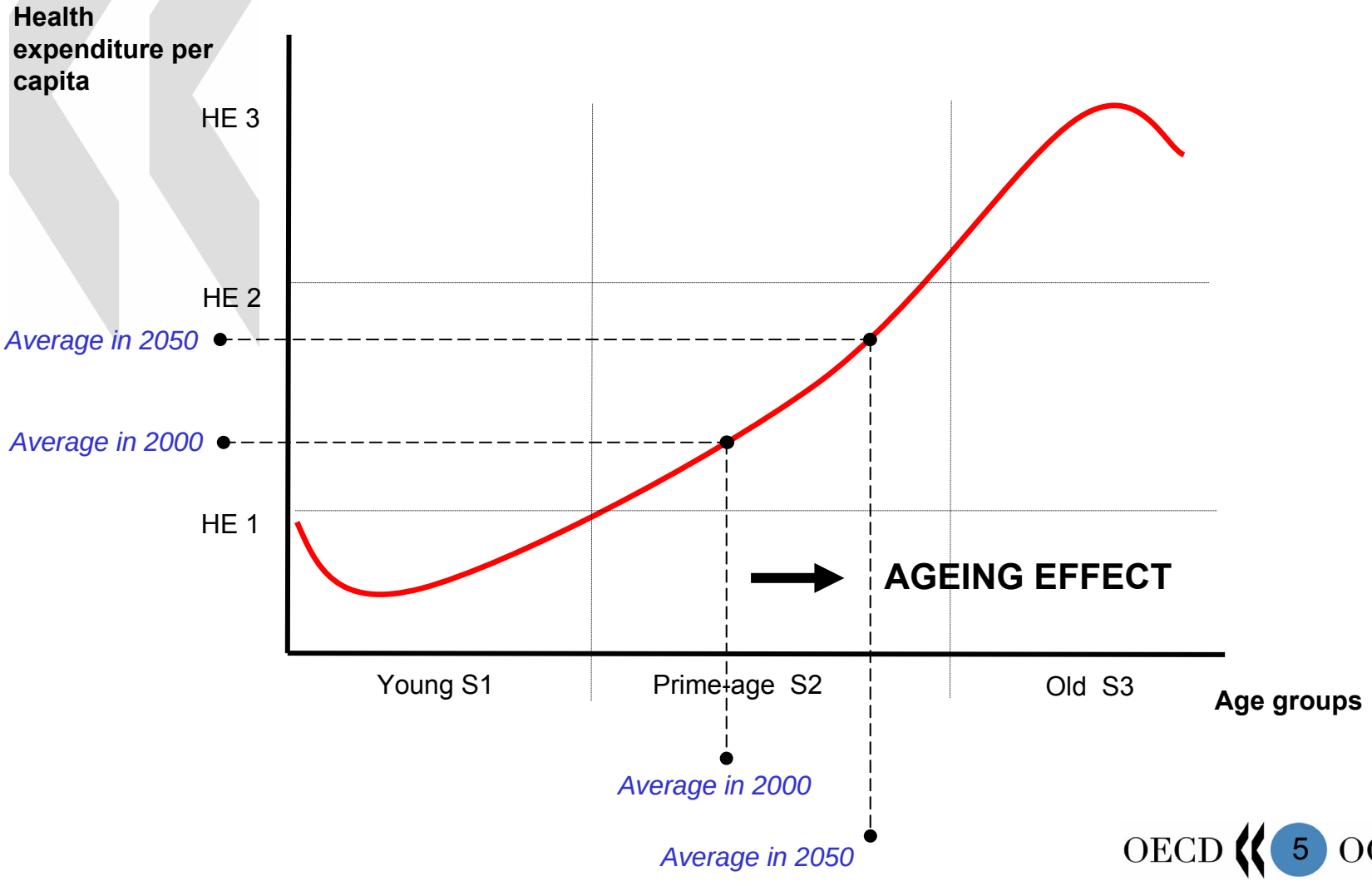
Source: European Network of Economic Policy Research Institutes, The AGIR project

The health care expenditure profiles shift over time (e.g. France)

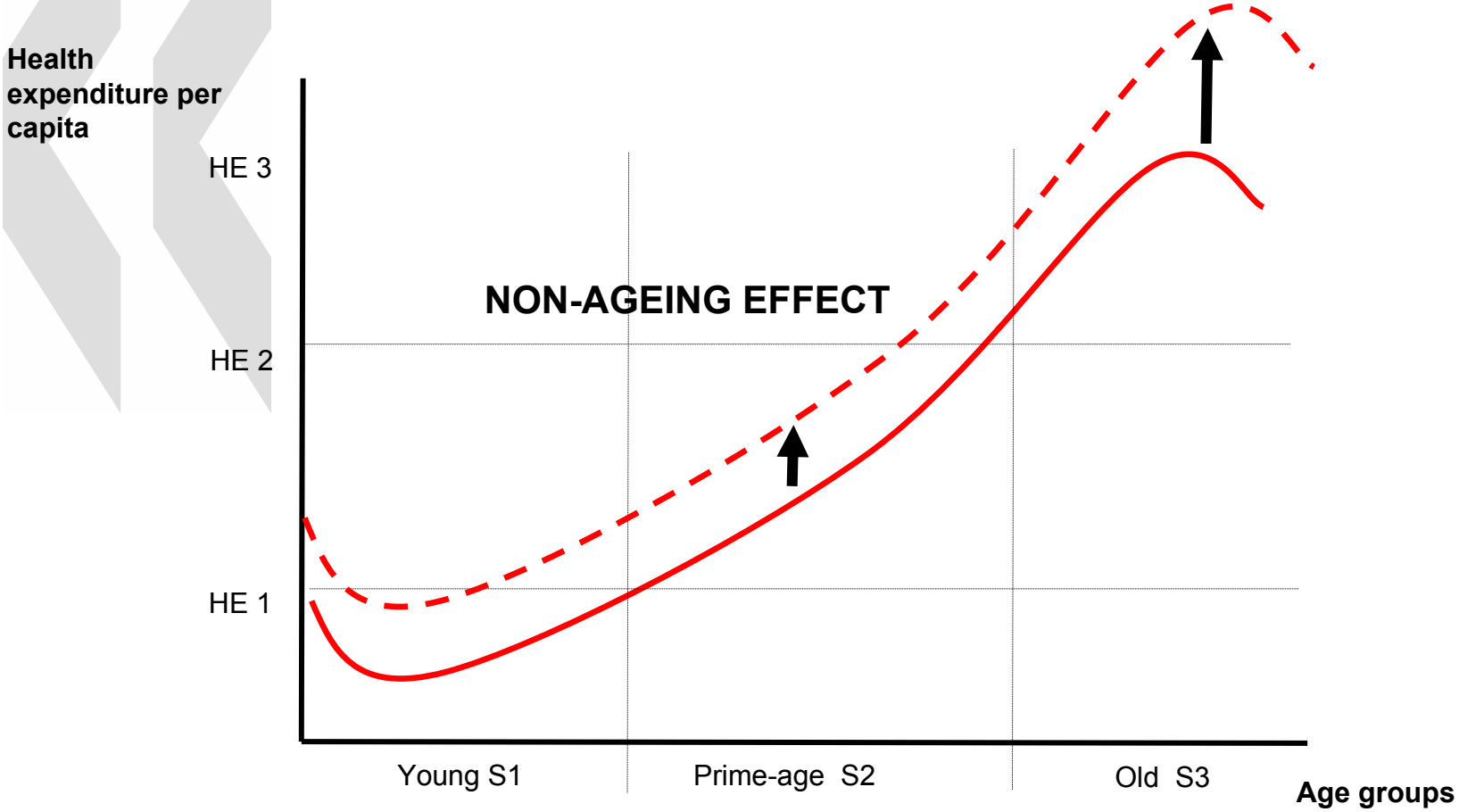


Source: ***Dormont and Huber, 2005***

Health expenditures by age groups: pure demographic factors



Health expenditures by age groups: the non-demographic factors



Questioning the future impact of ageing

- In the 2001 Joint EC/OECD Projection Exercise, health expenditures were projected just on the basis of the ageing effect…
- … but, there is a debate on whether the influence of ageing on health expenditure is overstated. Notably, because of:
  - Improved health expectancies
  - Death-related costs
- … and non-demographic factors could be the most important drivers of health care expenditures

How to evaluate the effect of non-demographic drivers?

- The main non-demographic drivers of real health expenditures pointed out in the literature are:

  1) **Demand (income elasticity)**
  2) **Technology/relative price effects**

- Here we will use a top-down (aggregate) approach to estimate each of these components

Demand

- Measured income elasticity of health care depends on the level of analysis (Getzen, 2000)
- The higher the level of aggregation, the higher the estimated income elasticity

Income elasticities: the empirical evidence

Individual (micro)	**Income elasticity**
Insured	
Newhouse and Phelps (1976)	≤0.1
Hahn and Lefkowitz (1992)	≤0
less insured/uninsured	
Falk et al (1933)	0.7
Andersen and Benham (1970) - dental	1.2
AHCPR (1997) - dental	1.1
Regions (intermediate)	
Fuchs and Kramer (1972) – 33 states, 1966	0.9
Di Matteo and Di Matteo (1998) – 10 Canadian provinces, 1965-91	0.8
Freeman (2003) – US states, 1966-98	0.8
Nations (macro)	
Newhouse (1977) – 13 countries, 1972	1.3
Getzen (1990) – US, 1966-87	1.6
Schieber (1990) – seven countries, 1960-87	1.2
Gerdtham and Löthgren (2000, 2002) - 25 OECD countries, 1960-97	Co-integrated
Dreger and Reimers (2005) – 21 OECD countries	Unitary elasticity not rejected

Technology/relative prices

- If the income elasticity is not very different from one, the observed increasing share of health care expenditure in GDP is likely to be due to supply-side factors…
- … which could be encapsulated in relative price effects, such as:
  - A relative increase of product variety
  - A relative increase of product quality
  - A relative increase of productivity
- A "true price index" would have to incorporate these effects. Omitting these effects would typically lead to an overestimation of income elasticities (Dreger and Reimers, 2005).

Estimation of each expenditure driver over the period 1981-2002

- Data requirements:
  - Health expenditures per capita and age groups
  - Changes in population structure

- The steps are:
  1. Estimate the pure ageing effect
  2. Estimate the increase in expenditure due to income growth (Given the mixed empirical evidence on income elasticities, we assumed an unitary income elasticity and run sensitivity analysis around that value)
  3. Derive the technology/relative price effects as a residual

This approach was put forward by Australian Productivity Commission (2004)

Derivation of the non-demographic drivers, 1981-2002

	Total growth Health Expenditures per capita	Pure age-effect	Income-effect	**Residual (g_{RES})**
EU-15	**5.4**	**0.4**	**4.6**	**0.4**
France	*6.1*	*0.4*	*4.9*	***0.9***
Germany	*4.7*	*0.4*	*3.7*	***0.5***
UK	*6.5*	*0.2*	*5.5*	***0.8***

Projections of demographic and non-demographic drivers

- Ageing effect: per capita health expenditures by age-group (HE_i) remain constant, only the population shares (S_i) change:

$$\Delta HE_A = \sum_i \left(S_i^{2050} - S_i^{2000} \right) \cdot HE_i^{2000}$$

- Non-ageing effect: per capita health expenditures by age-group (HE_i) shift over time, population shares (S_i) remain constant:

$$\Delta HE_{NA} = \sum_i S_i^{2000} \cdot \left(HE_i^{2050} - HE_i^{2000} \right)$$

Where (using the country-specific residuals):

$$HE_i^{2050} = \left(1 + g_{RES}\right)^T \cdot HE_i^{2000}$$

Projected changes in the shares, 2050

(in per cent GDP)

	France	Germany	UK
2002	***5.5***	***6.5***	***3.9***
+ ageing	1.0	1.6	0.9
+ non-ageing	3.0	1.8	1.8
2050	***9.5***	***9.9***	***6.6***

Sensitivity analysis

- Income elasticity (0.9; 1.1)
- Trends in old-age morbidity and disability
  - Shift over time for the groups +65 years old of the health-expenditure per capita profiles according trends in life expectancy
    - Intermediate scenario: Δyears in good health = Δlife expectancy
    - Compression scenario: Δyears in good health = 1.5*Δlife expectancy
    - Expansion scenario: Δyears in good health = -0.5*Δlife expectancy
- Death-related costs
  - Costs of death = 3*Health costs for 85 years old*$(1+g_{RES})^{T}$
  - Total death expenditures by age group = Costs of death*Estimated number of deaths

Sensitivity analysis: income elasticities

(EU15, shares in per cent GDP)

	Baseline Elasticity = 1		Δ share Elasticity = 0.9		Δ share Elasticity = 1.1
2002	***5.4***				
+ ageing	0.5				
+ non-ageing	0.4		+0.1		0.0
2020	***6.3***				
+ ageing	0.3				
+ non-ageing	0.2		+0.1		0.0
2030	***6.9***				
+ ageing	0.4				
+ non-ageing	0.5		+0.4		0.0
2050	***7.8***		***+0.6***		***0.0***

Sensitivity analysis: trends in old-age morbidity and disability

(EU15, shares in per cent GDP)

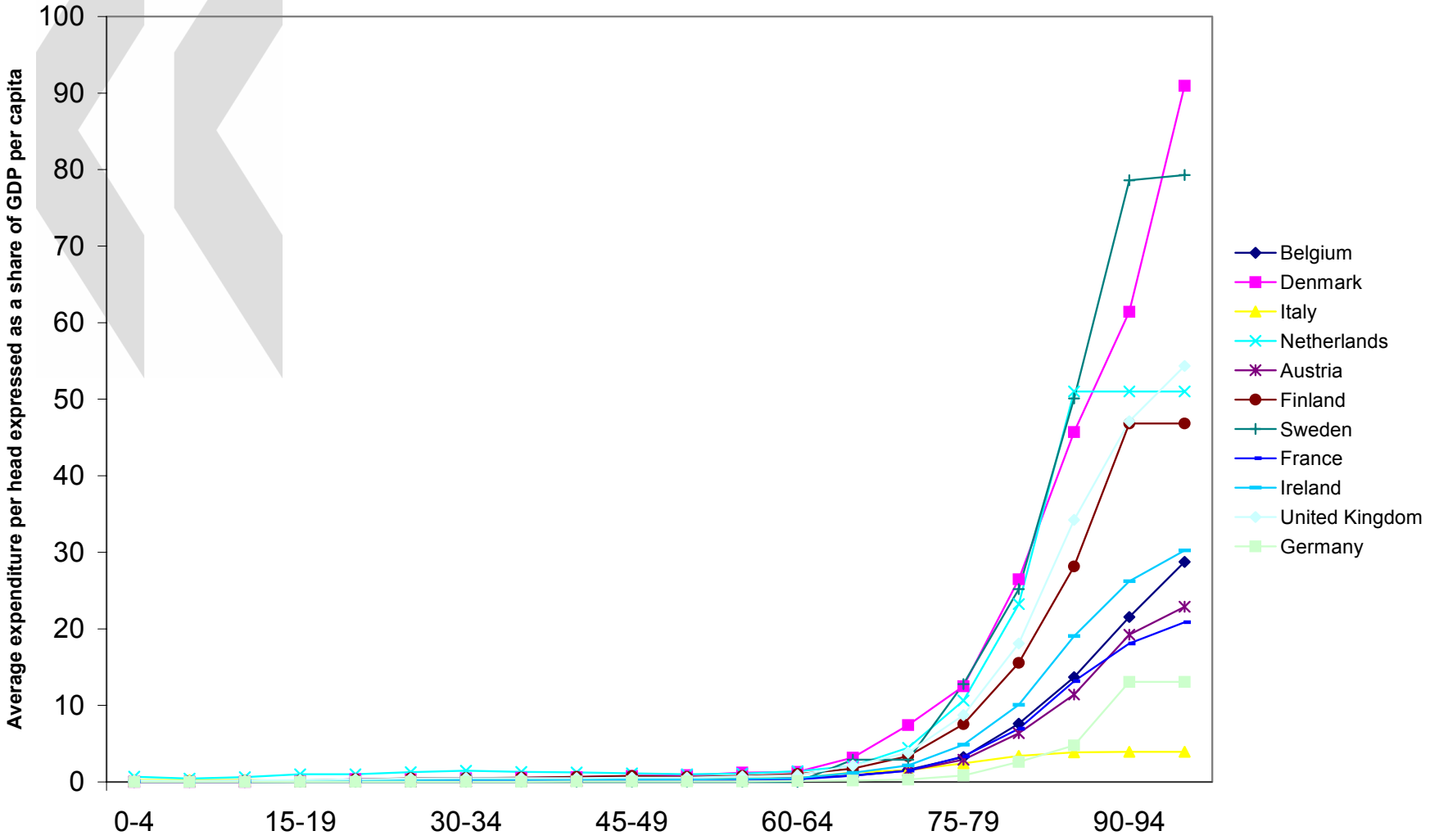
	Baseline	**Δ share** Intermediate scenarios	**Δ share** Compression scenario	**Δ share** Expansion scenario	**Δ share** Death-related cost scenario
2002	***5.4***				
+ ageing	0.5	-0.2	-0.3	+0.1	-0.3
+ non-ageing	0.4				
2020	***6.3***				
+ ageing	0.3	-0.1	-0.1	+0.0	-0.2
+ non-ageing	0.2				
2030	***6.9***				
+ ageing	0.4	-0.1	-0.1	+0.1	+0.1
+ non-ageing	0.5				
2050	***7.8***	***-0.4***	***-0.5***	***+0.2***	***-0.4***

Some conclusions & Further work

- Ageing effects are going to increase over time, but they account only for a part of the increase in health care expenditures (as a share of GDP), thus …
- … growth in non-demographic factors seems more important
- Further decomposition of expenditures (pharmaceuticals, inpatient, outpatient care)
- Specific treatment of Long-term care expenditure profiles and impact of technology are different (data needed)
- Sensitivity analysis by specifying relative price effects
- Gender-specific expenditure profiles and population projections

Thank You !

Long-term care



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Income elasticities