

Projections of Health and Long Term Care public expenditures

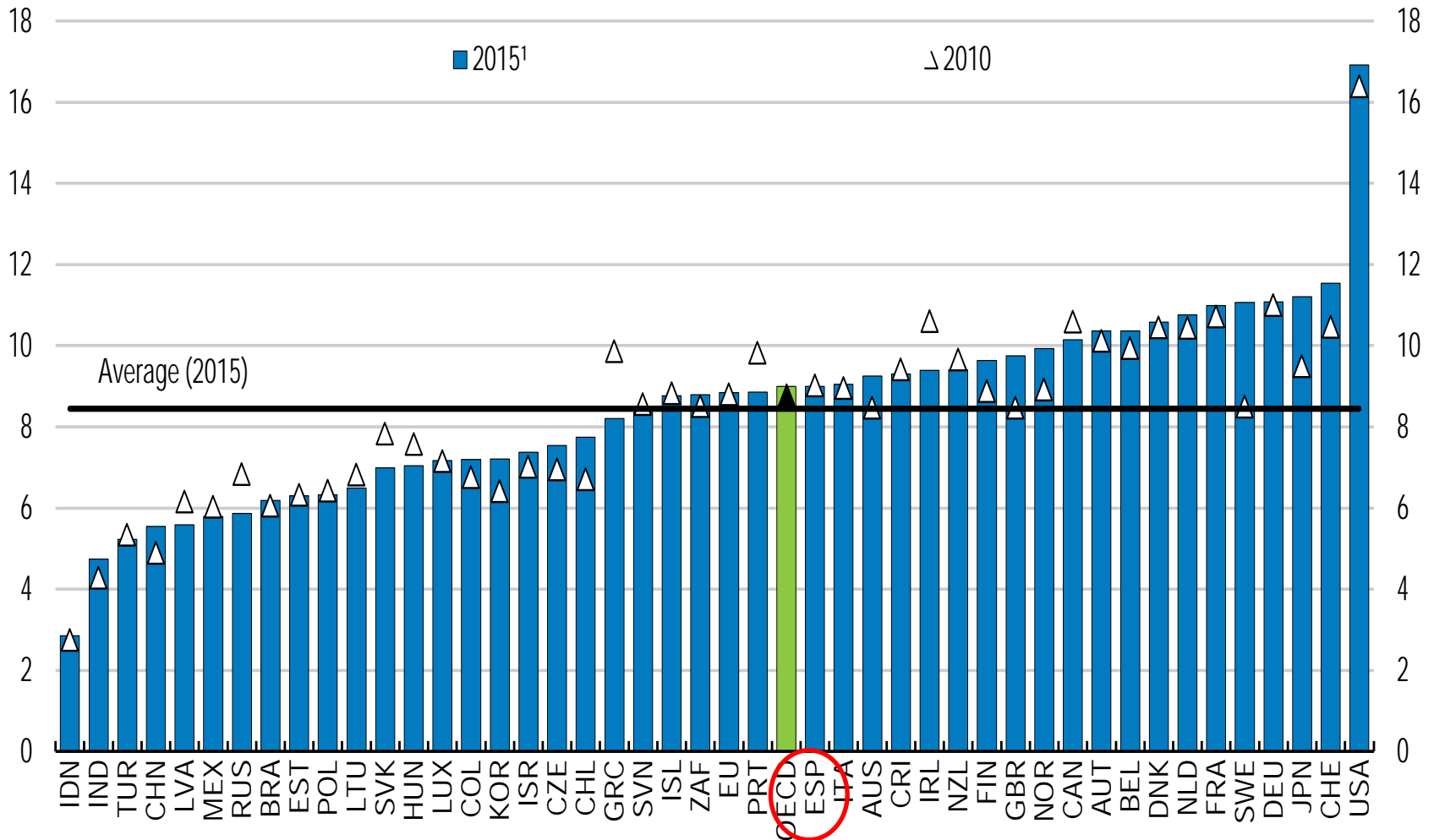
**VI International Congress Long-Term care and
Quality of Life
Madrid, 23-24 May 2017**

***Joaquim Oliveira Martins
(OECD and PSL, University Paris-Dauphine)***

***Characteristics and
trends of health
spending***

Wide dispersion of health expenditure across OECD & BRICs

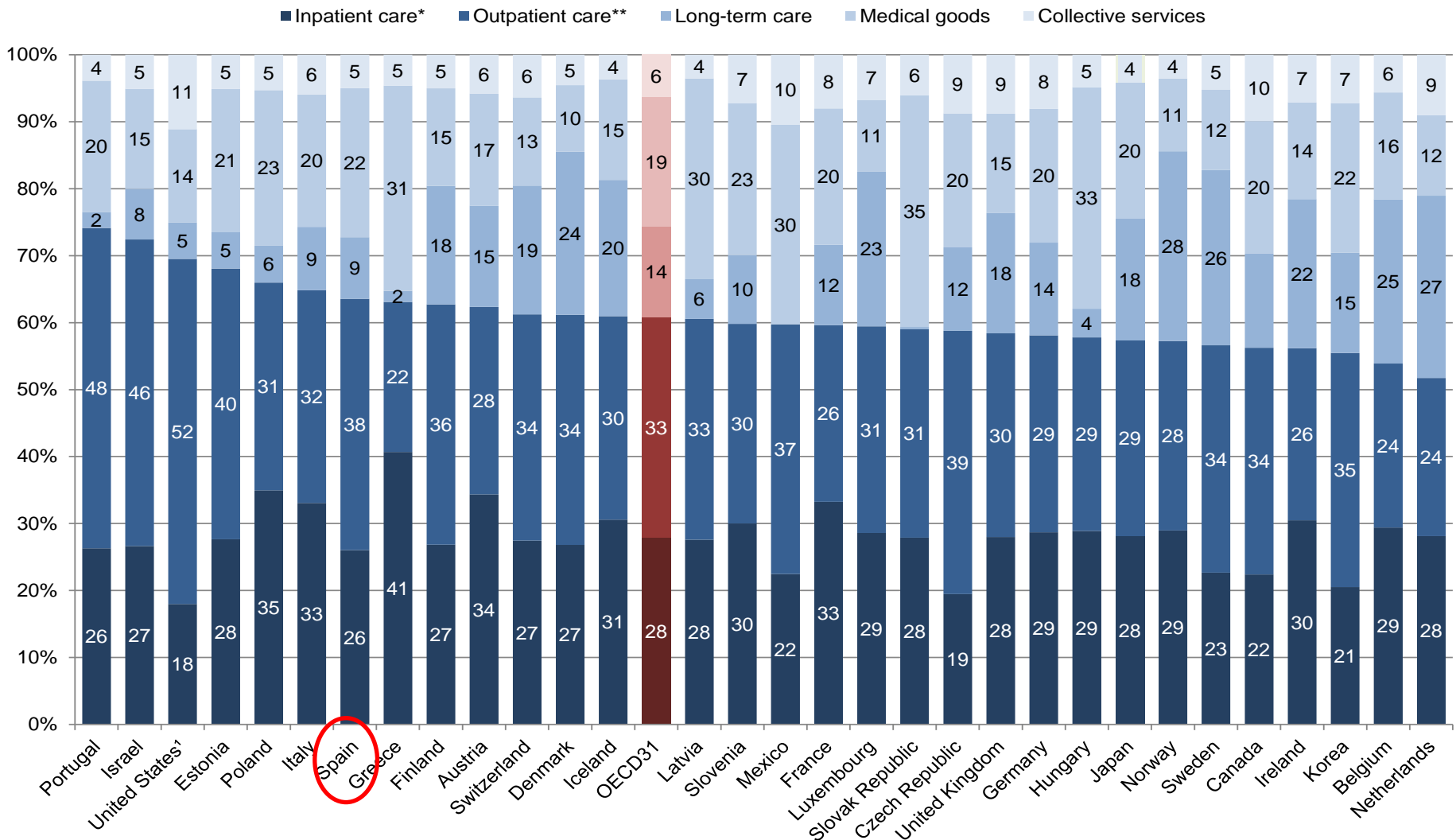
As a % of GDP



Source: OECD Health Statistics 2016

OECD Health expenditure is mainly allocated to individual health services (above 60% on average)

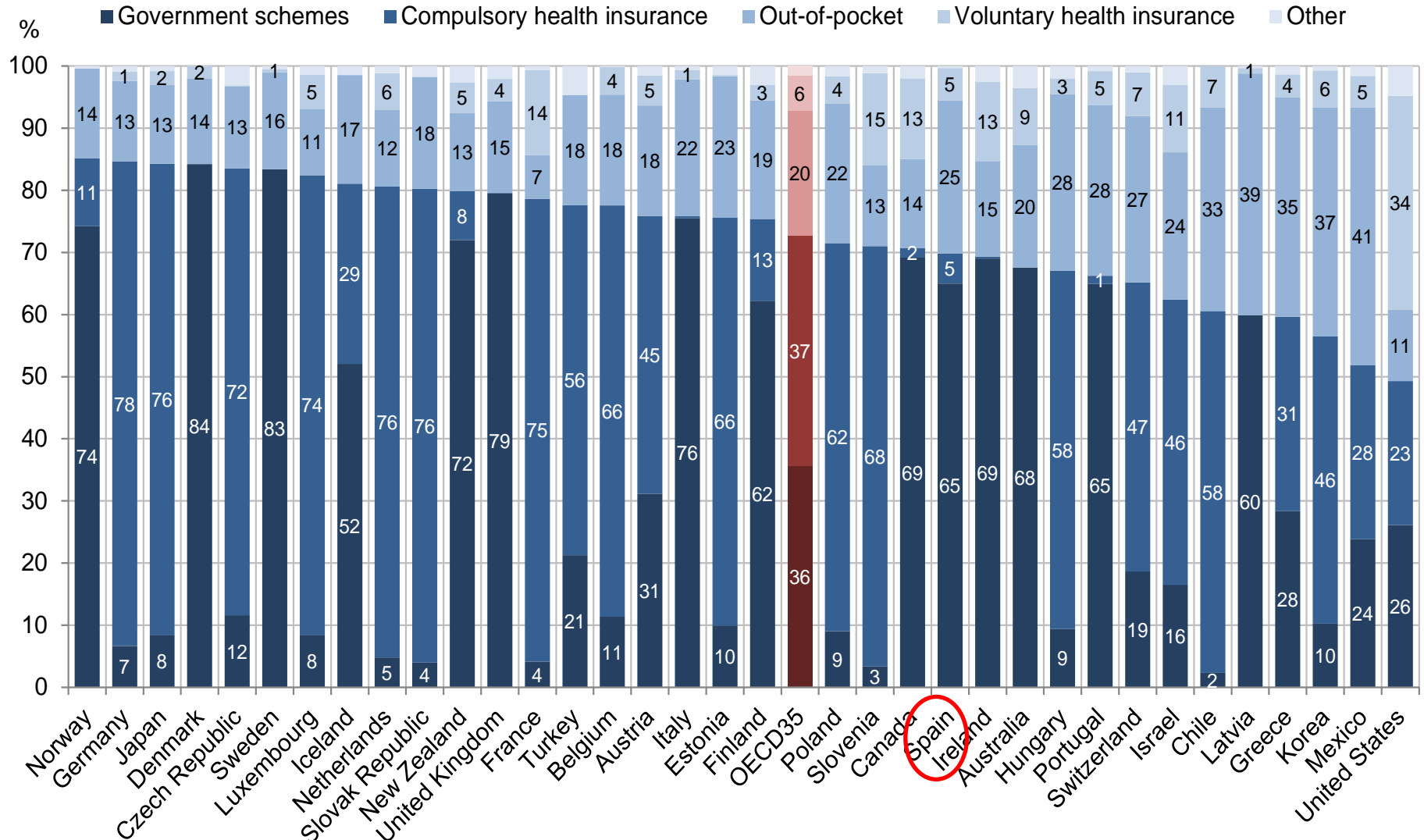
Health Expenditure by function, 2014 (or nearest year)



Source: OECD Health Statistics 2016, OECD

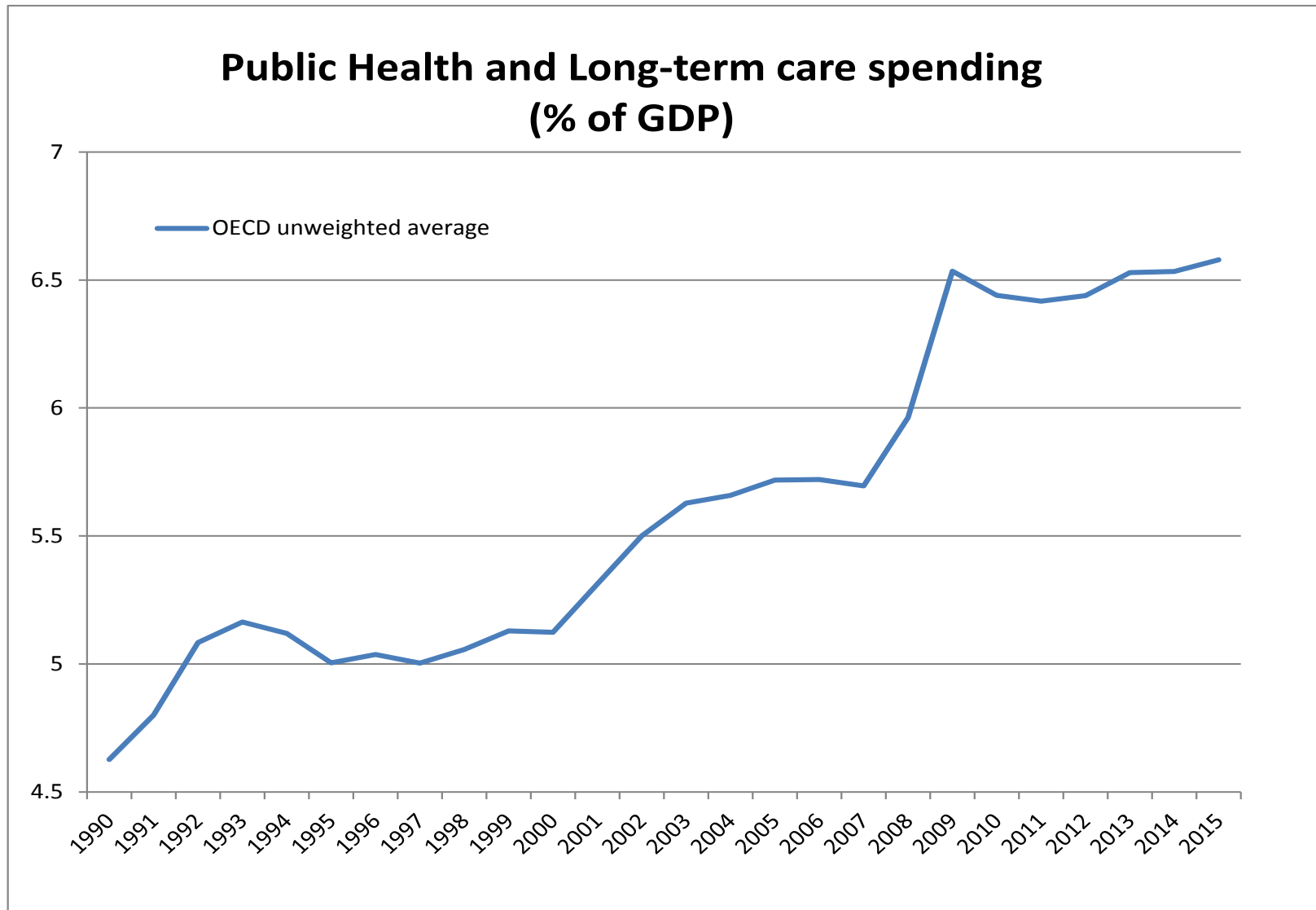
The public sector is the main source of Health financing in most OECD countries (above 70% on average)

Expenditure on health by type of financing, 2014 (or nearest year)



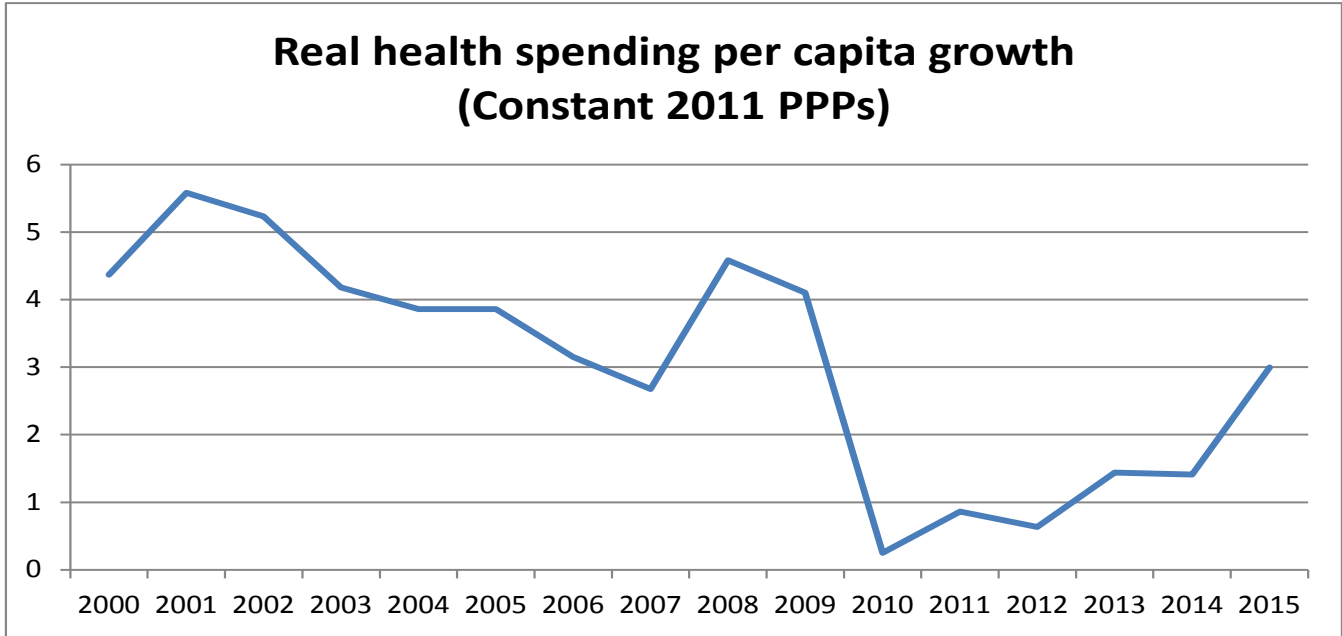
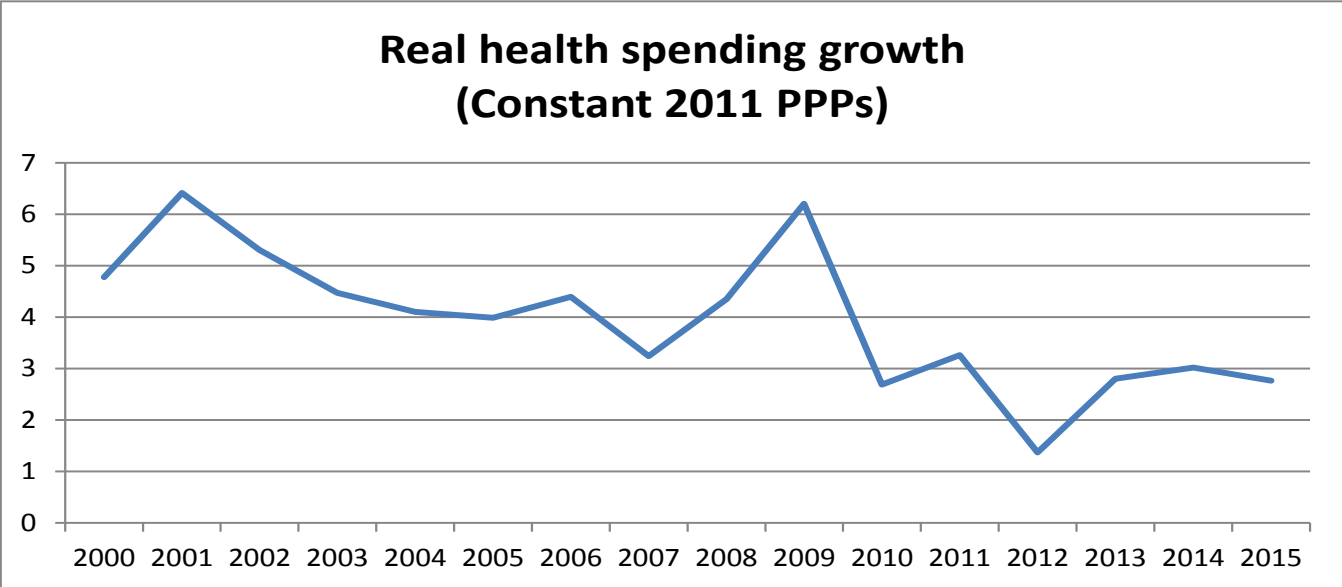
Source: OECD Health Statistics 2016, OECD

Public Health spending has displayed a long-term tendency to increase in % of GDP



Source: OECD Health database (2016).

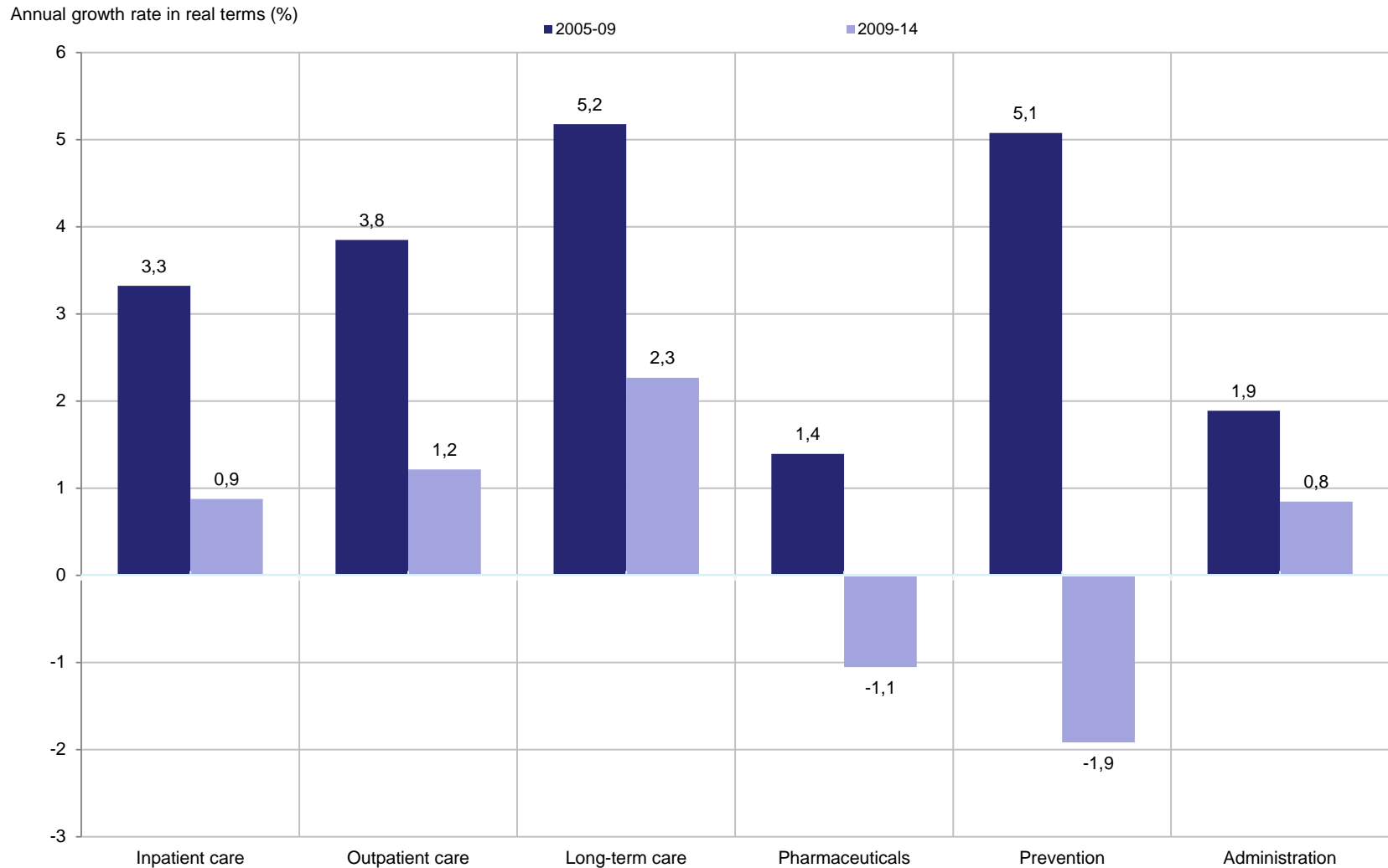
Growth in Health spending is picking-up



Source: OECD Health Statistics 2016

Pharmaceutical and prevention spending have been the main areas for cuts in EU countries

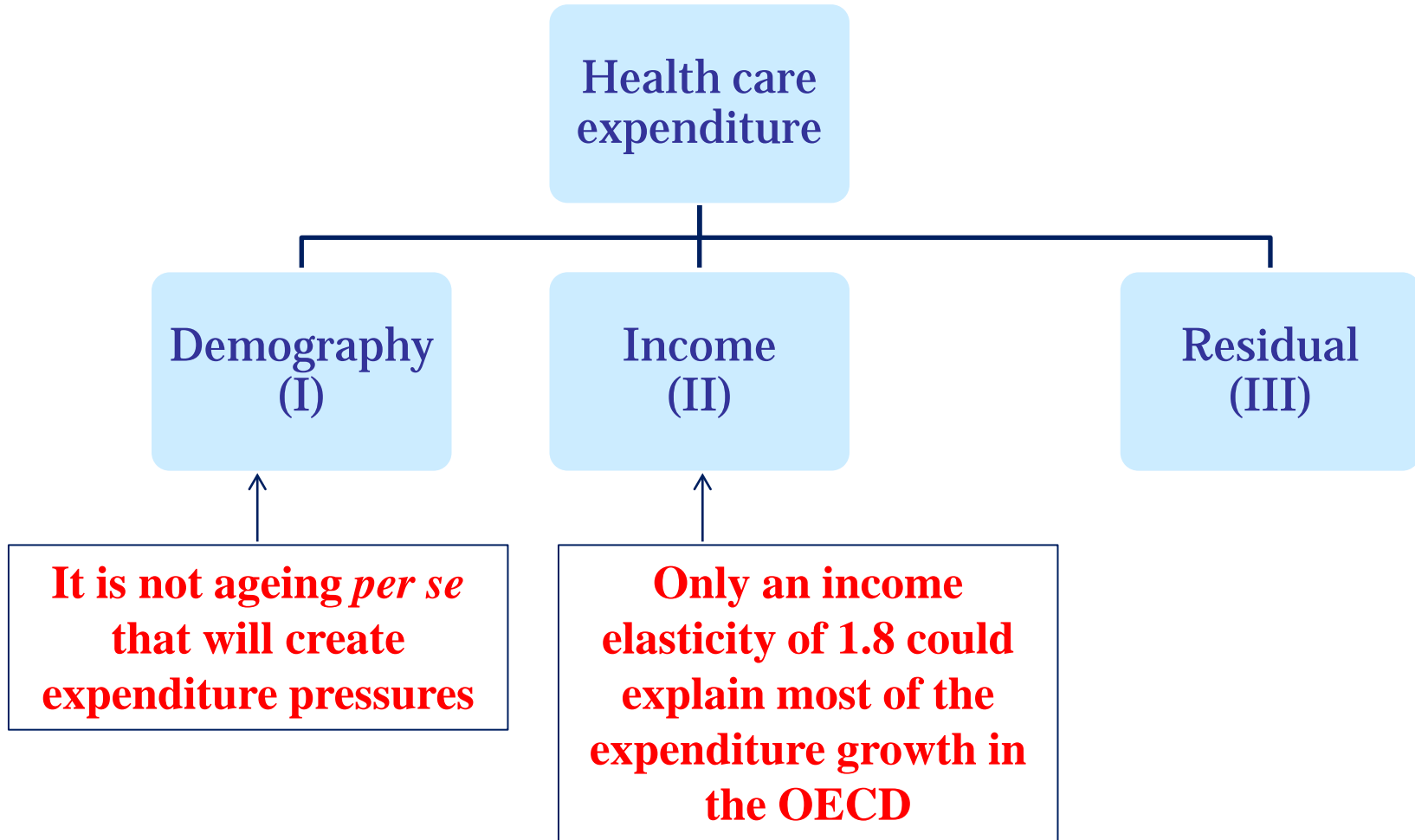
EU average, 2015-14



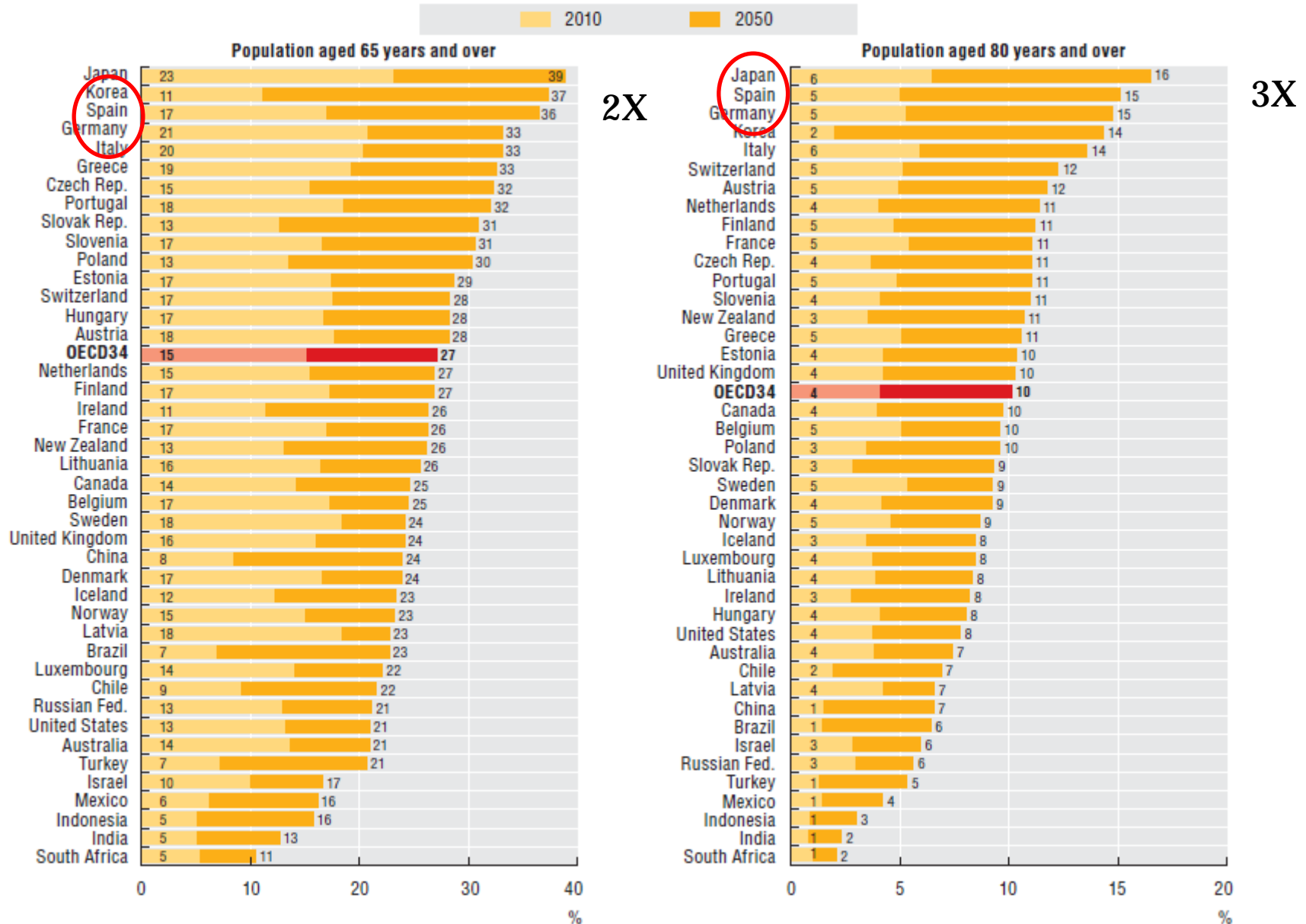
Source: OECD Health Statistics 2016, Eurostat Database

***Drivers of health
spending***

Main health expenditure drivers



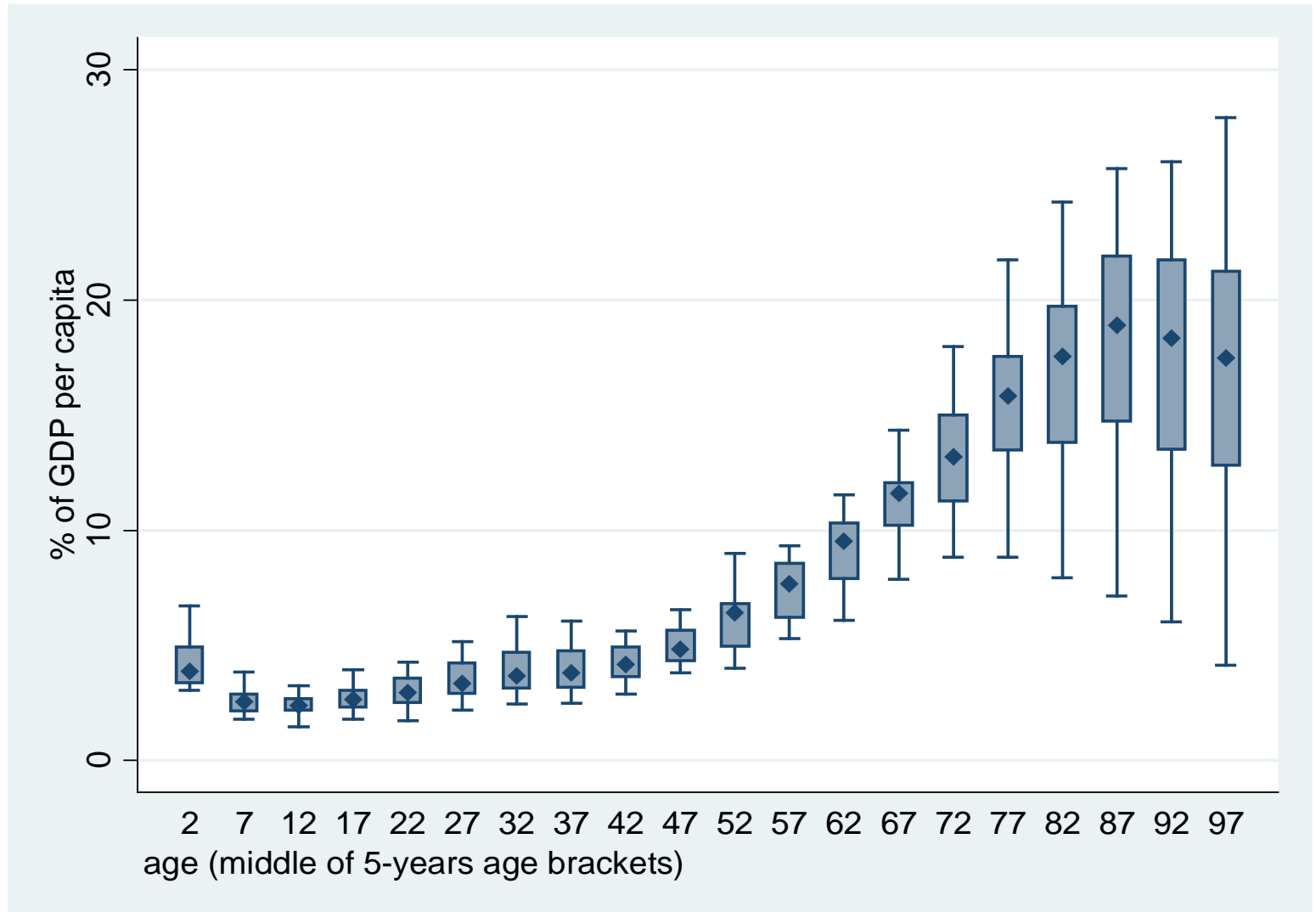
(I) The share of population aged over 65 and 80 countries will increase sharply between 2010-50



Source: OECD Historical Population Data and Projections Database, 2015

(II) Health care expenditures per capita increase by age groups, but not because of ageing *per se*

Spending p.c.
in group [i]
normalised by
GDP p.c.



Cross section of OECD countries
Sources: EC + National sources

(II) Health income elasticity is roughly unitary

Papers	Elasticity
<i>Individuals (Micro)</i>	
Newhouse and Phelps (1976)	<1
Manning et al. (1987)	≈0
<i>Regions (Intermediate)</i>	
Feldstein (1971)	0.5
Backer (1997)	0.8
<i>Nations (Macro)</i>	
Newhouse (1977)	1.3
Fogel (1999)	1.6
<i>Taking into account cointegration</i>	
Baltagi and Moscone (2010)	<1
Bech <i>et al.</i> (2011)	≈1
Dreger and Reimers (2005)	≈1
Freeman (2003)	≈0.8
Narayan <i>et. al</i> (2011)	<1
<i>Using Instrumental Variables</i>	
Acemoglu <i>et al.</i> (2009)	0.7
Holly <i>et al</i> (2011)	0.75-0.95 (In the fixed effect model and much smaller in the dynamic one)
This paper	0.5 - 1.0 (Depending on the specification)

Source: Getzen (2000) and authors' compilation.

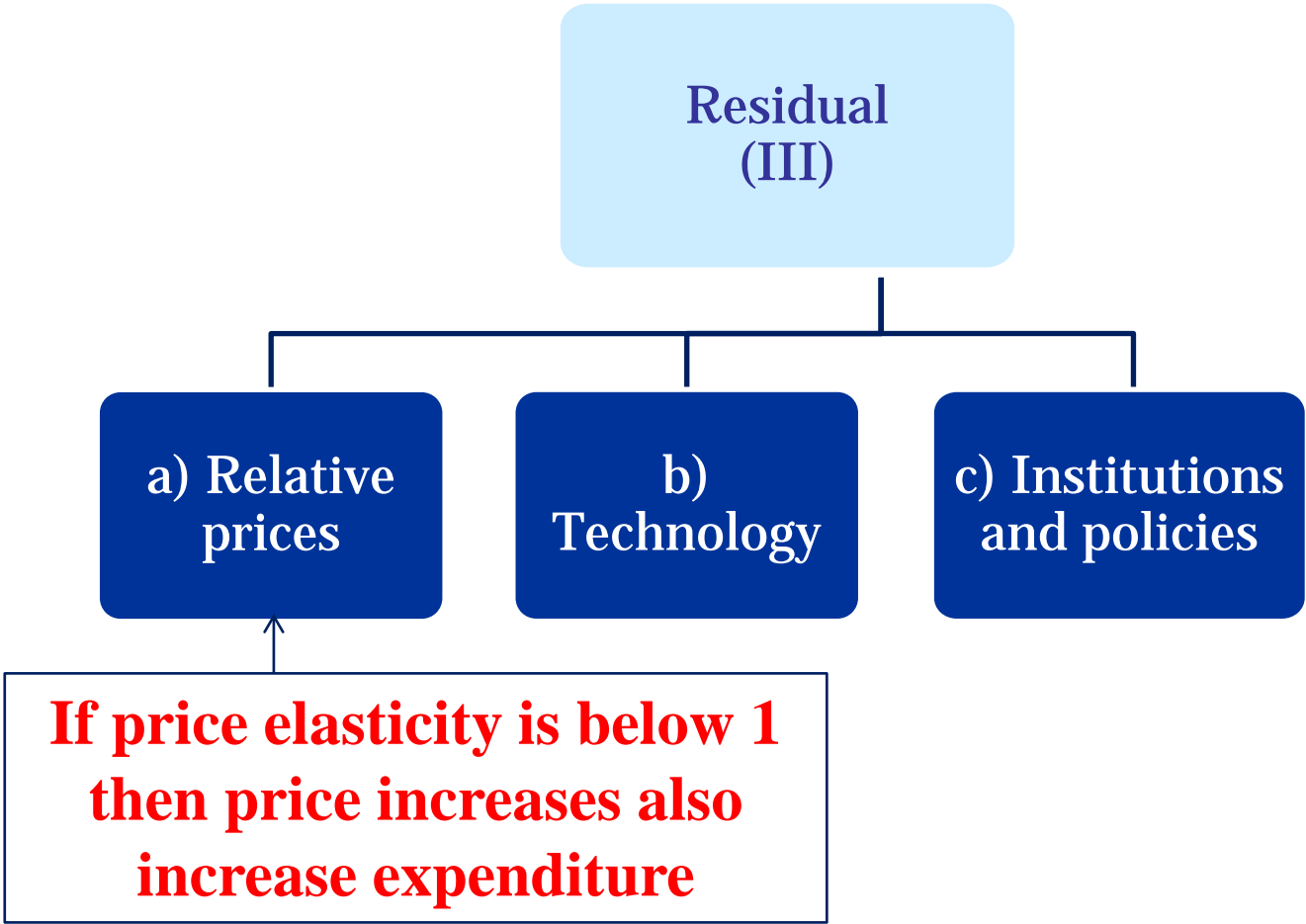
(III) What is the size of the unexplained expenditure residual?

Average annual growth rate 1995-2009 of health expenditures per capita (in %)

	Health spending	Age effect	Income effect	Residual	<i>Memo item:</i> Residual with unitary income elasticity
Selected countries:					
Austria	3.3	0.4	1.3	1.5	1.2
Denmark	3.7	0.2	0.8	2.7	2.5
Finland	4.1	0.6	2.0	1.5	1.1
France	1.6	0.5	0.9	0.3	0.0
Germany	1.7	0.6	0.8	0.2	0.0
Italy	3.1	0.6	0.4	2.1	2.0
Japan	2.7	1.2	0.8	0.7	0.5
Korea	11.0	1.1	3.1	6.5	5.7
Netherlands	5.2	0.5	1.4	3.3	2.9
Portugal	4.6	0.6	1.5	2.4	2.0
Spain	3.4	0.5	1.5	1.4	1.0
Switzerland	2.9	0.4	0.9	1.6	1.4
United Kingdom	4.6	0.2	1.5	2.8	2.5
United States	3.6	0.3	1.1	2.3	2.0
OECD total average	4.3	0.5	1.8	2.0	1.5
BRICS average	6.2	0.5	3.2	2.5	1.7
Total average	4.6	0.5	2.0	2.0	1.5

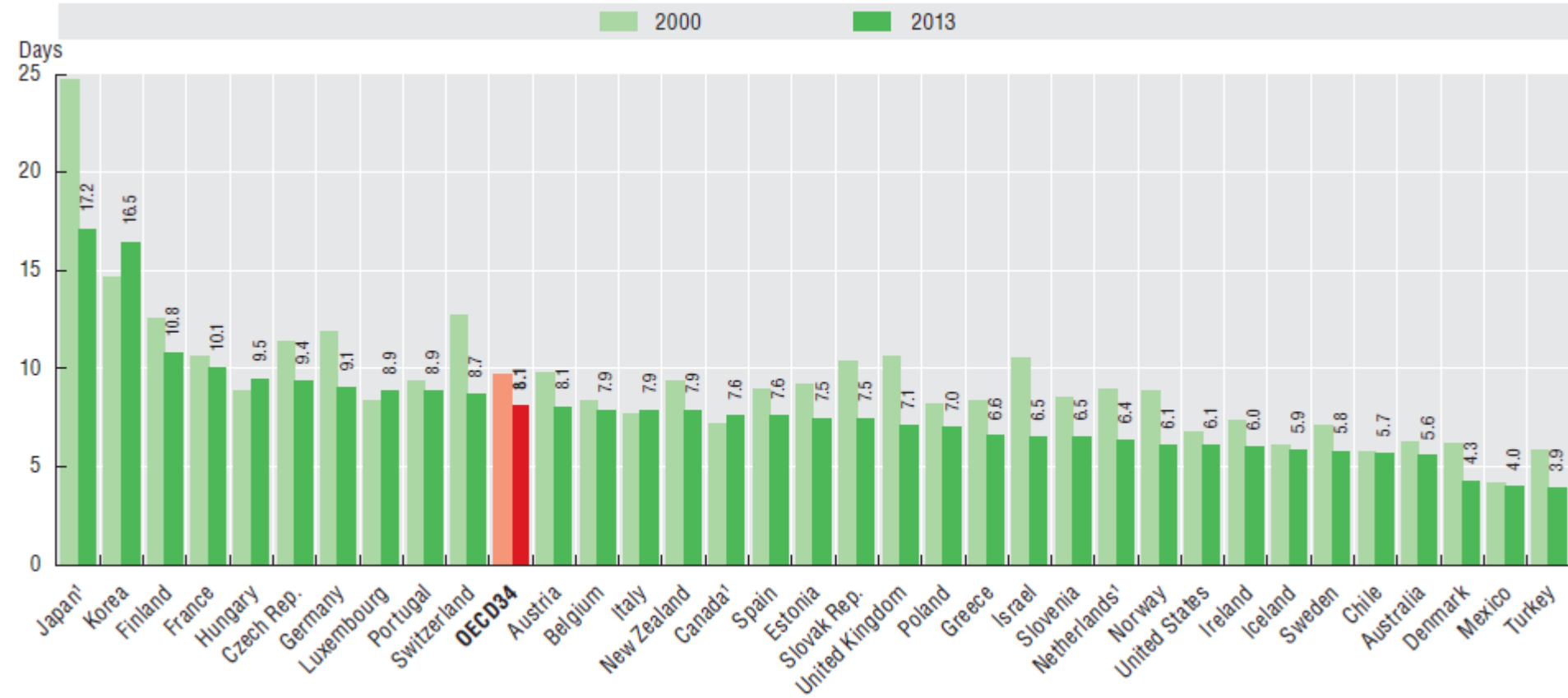
With an income elasticity of 0.8

Unbundling the expenditure residual



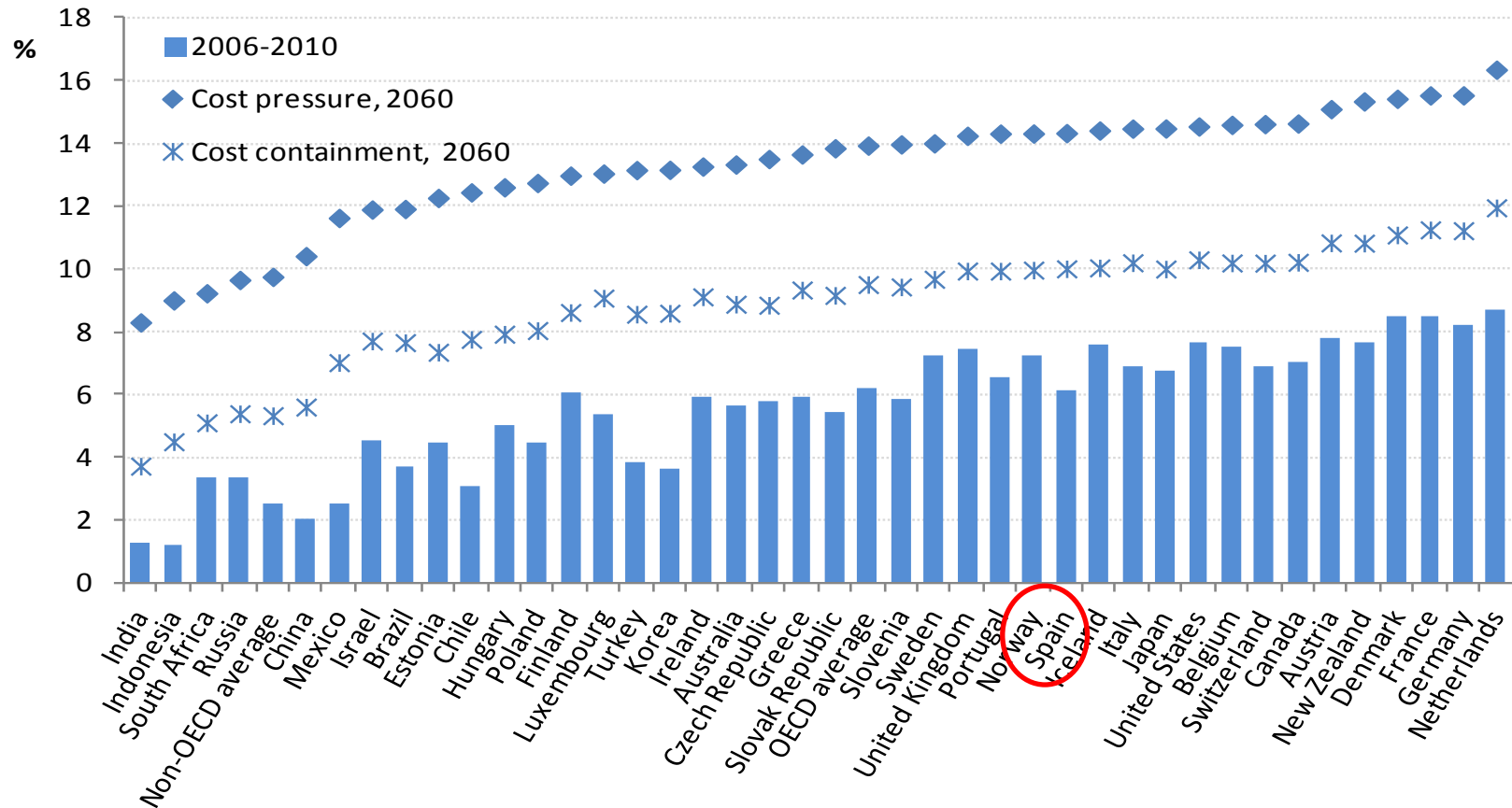
There are efficiency gains that could slow down the expenditure residual

Average length of stay in hospital, 2000 and 2013 (or nearest year)



1. Data refer to average length of stay for curative (acute) care (resulting in an under-estimation).

Projections of Public Health + Long-term care expenditures (in % of GDP)



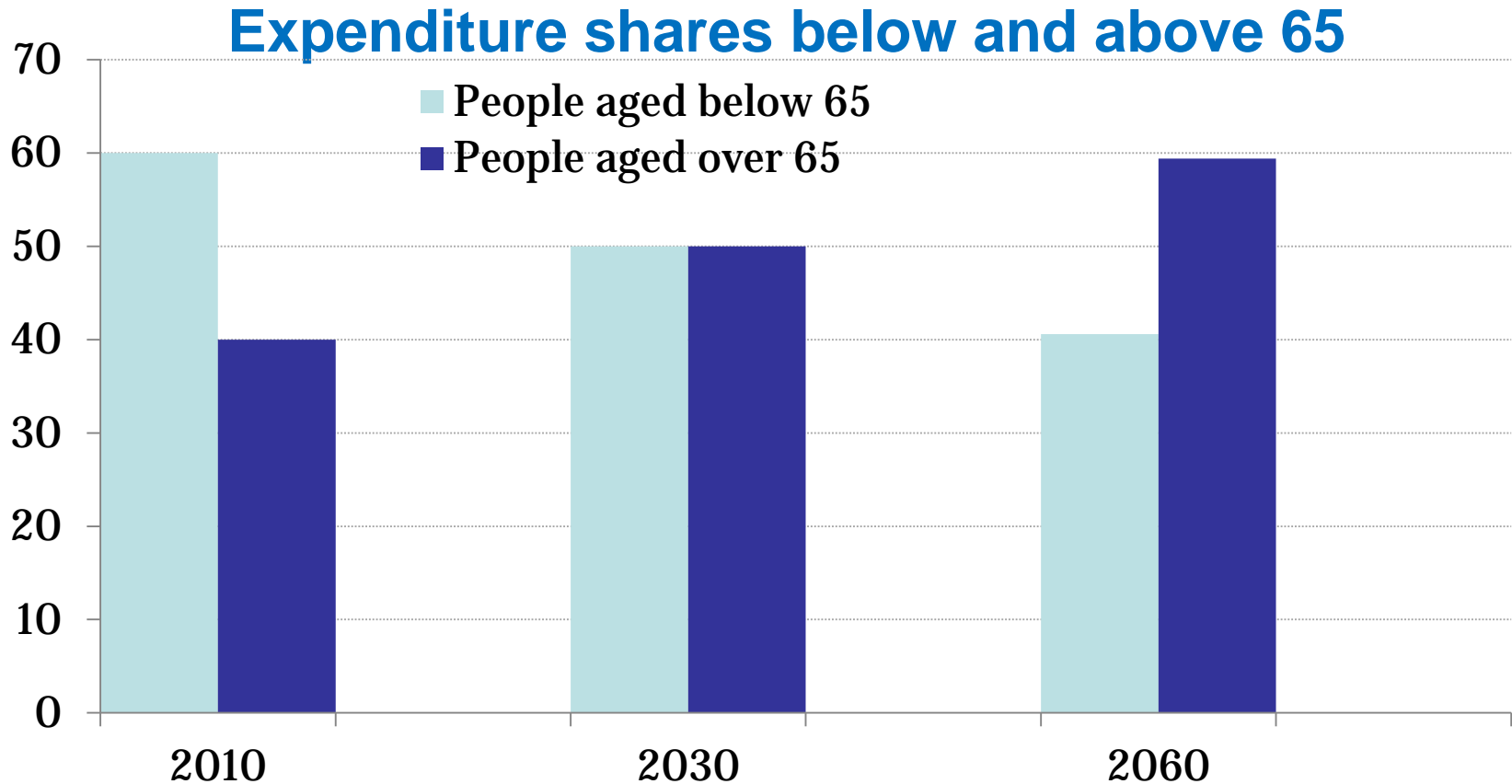
Cost pressure scenario: healthy ageing, income elasticity=0.8, residual=1.7% per year

Cost containment scenario: healthy ageing, income elasticity=0.8, residual phasing out over the projection period

Convergence mechanism based on differences across countries in health shares to GDP in the base year compared with OECD average

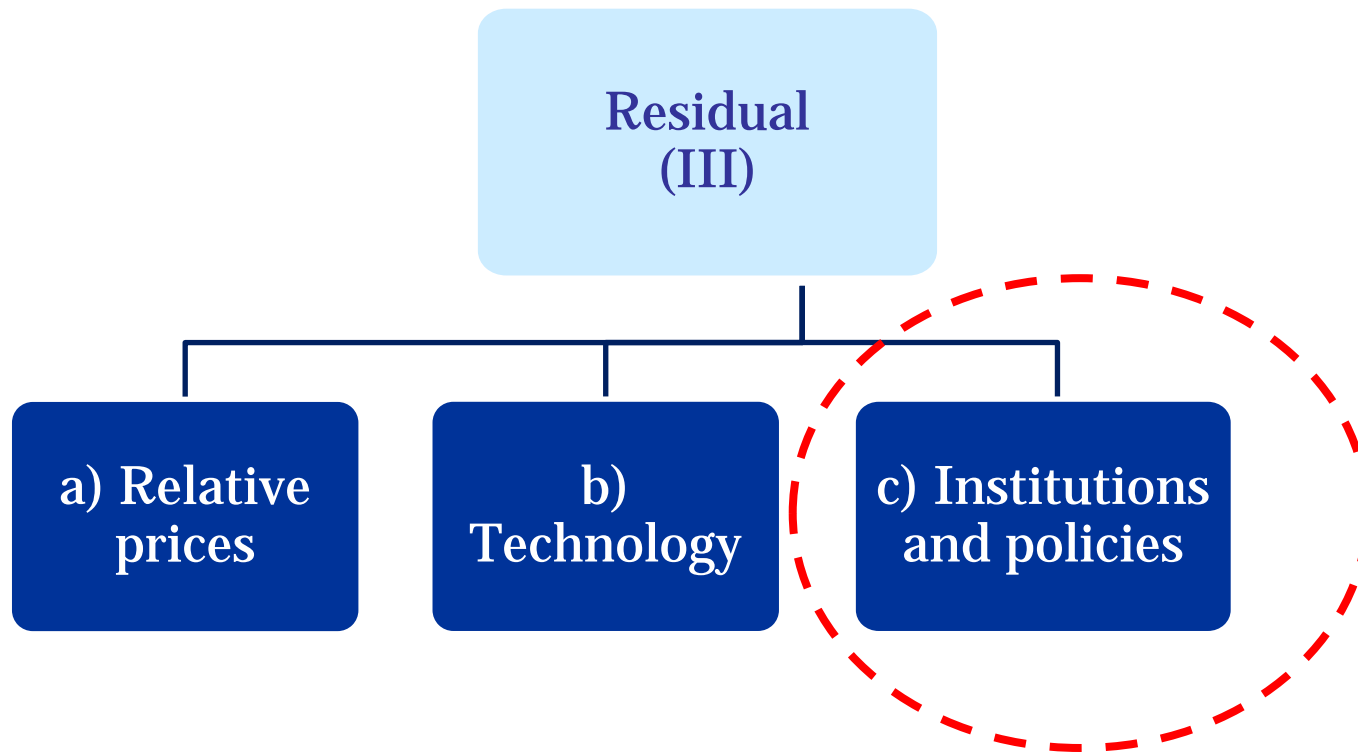
Source: de la Maisonneuve and Oliveira Martins (2013)

The age structure of Health expenditures will significantly change



NB: Non-demographic effects are assumed to be homothetic across ages, so they do not change the age structure of spending

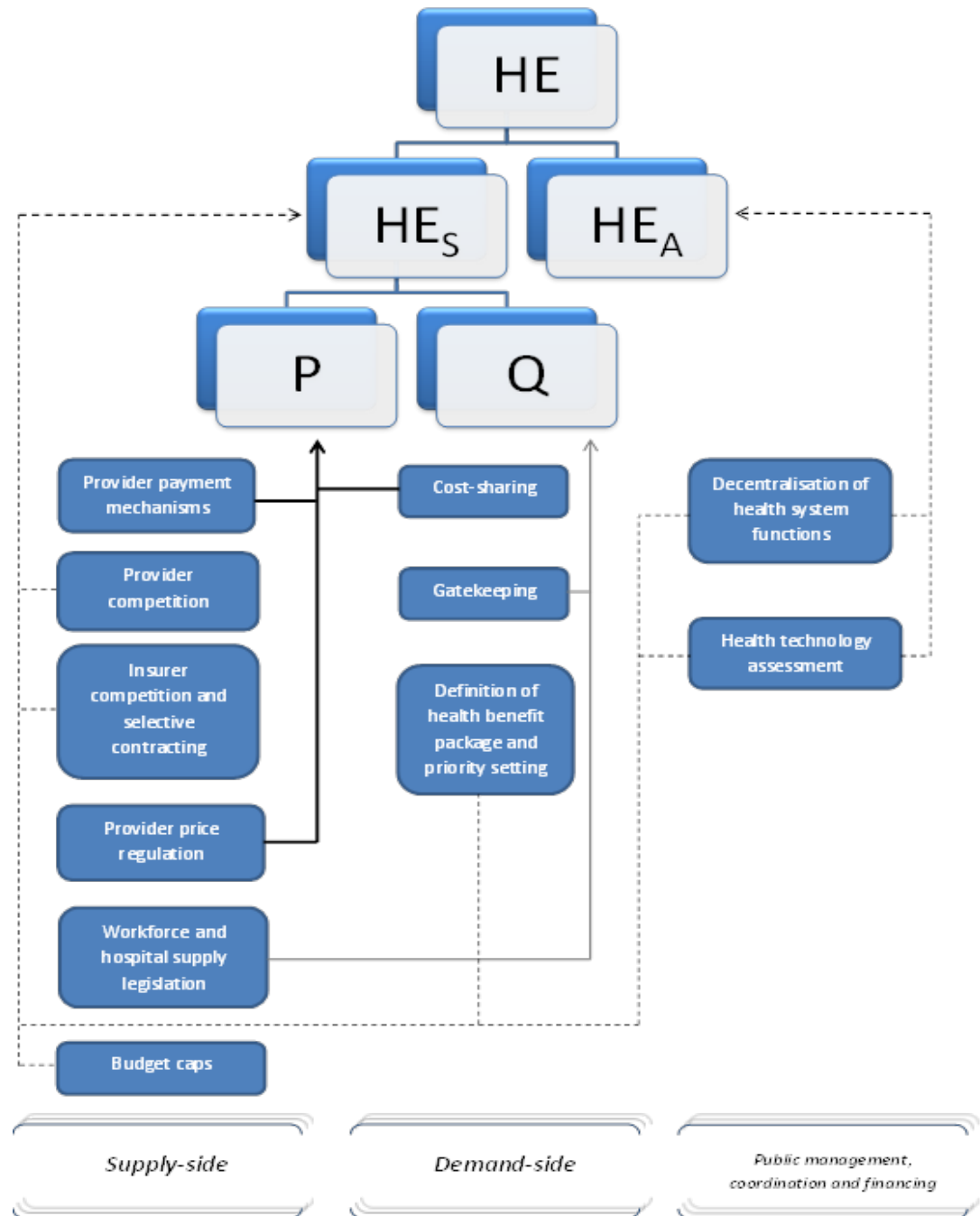
Unbundling the expenditure residual



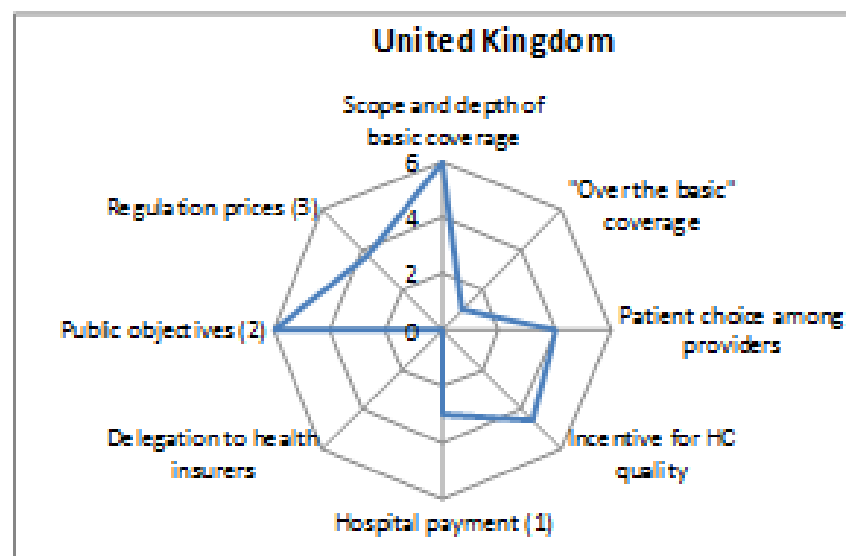
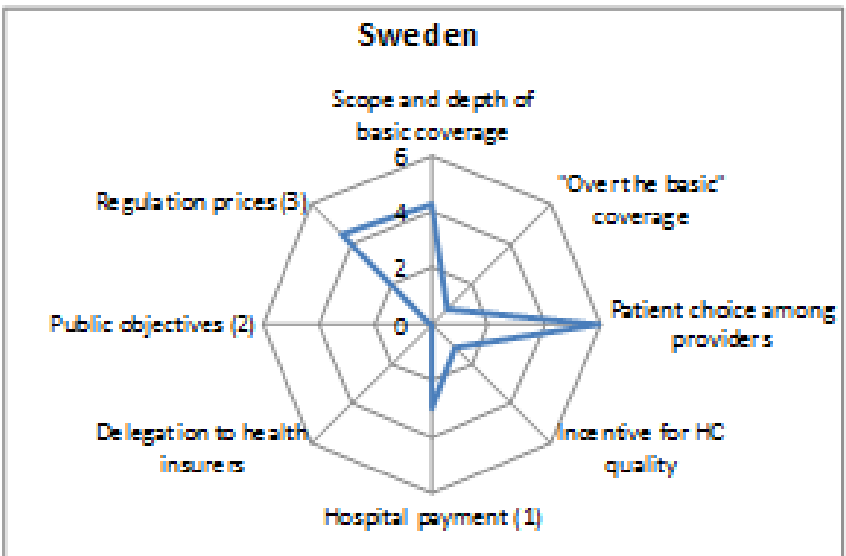
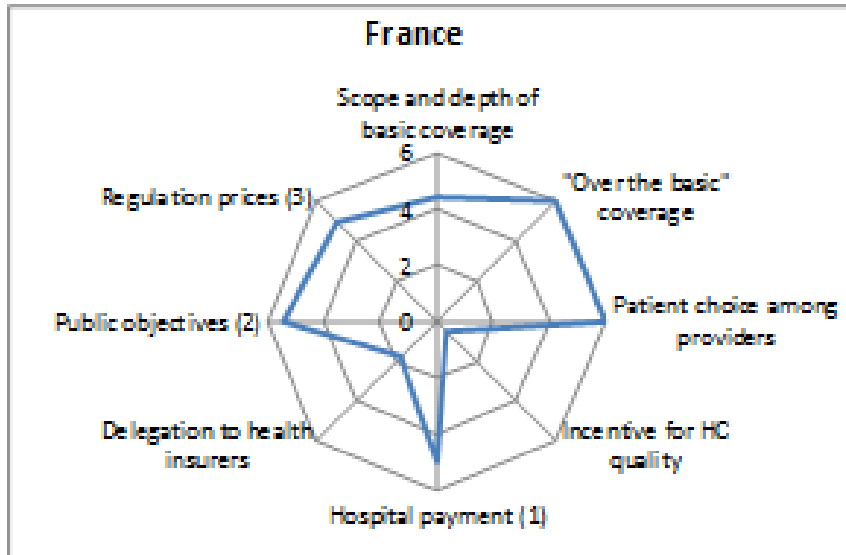
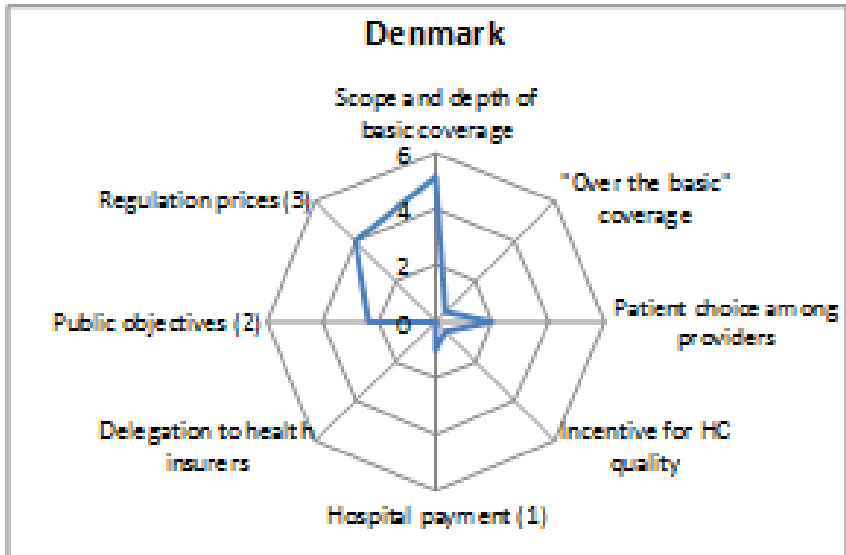
Recent work investigates (1) the relationship between policy and institutional factors and healthcare expenditures and (2) how much policy/institutions can explain of cross-country dispersion in expenditures

Policy and Institutional determinants of Health spending

The information concerning the set of different policies and institutions used in this paper was derived from official questionnaires sent to governments by the OECD. This qualitative information (269 variables) was transformed into quantitative indicators, ranging from 0-6. This set of indicators for policies and institutions was subsequently limited to 20 (see Paris et al., 2010).



Characteristics of health systems in OECD countries



Policy and institutions indicators

Category	Institutional aspect	Variable name	Short definition and interpretation	Effect on health spending		
				Expected	Estimated Linear model	Estimated Non-Linear model
Supply-side	Provider payment	Physician payment	Incentives for higher volume in physician payment mechanisms (primary care, outpatient and inpatient specialists): predominant mechanism(s) from salary, capitation, FFS (higher score = stronger incentive to generate volume)	Positive	Negative	Negative
Supply-side	Provider payment	Hospital payment	Incentives for higher volume in hospital payment mechanisms: line-item or prospective global budgets, per case/DRG, per procedure/diem, retrospective funding, and their combinations (higher score = stronger incentive to generate volume)	Positive	No effect	No effect
Supply-side	Provider payment	Incentives for quality	Incentives for health care quality (patient outcomes and satisfaction): guidelines/protocol adherence incentives (including financial) and sanctions for physicians and/or specialists and/or hospitals (higher score = stronger incentives)	Ambiguous	Positive	Positive
Supply-side	Provider competition	Choice among providers	Degree of patient choice of physician, specialist and hospital (higher score = more choice)	Negative	No effect	No effect
Supply-side	Insurer competition	User choice of insurer	Single or multiple insurers; degree of patient choice of insurer for basic coverage and their market shares (higher score = more choice)	Ambiguous	No effect	Positive
Supply-side	Insurer competition	Lever	Existence of levers for competition in insurance markets: whether insurers have some control on benefit package, level of coverage and premia, and whether they can selectively contract with providers (including pharmaceutical companies); existence of risk-equalisation/risk-adjustment schemes; availability of consumer information on premia/coverage (higher score = more levers for competition)	Negative	No effect	Negative
Supply-side	Workforce supply legislation	Regulation of physician supply	Existence of quotas for medical students, specialties and location; policies for shortage/redistribution (higher score = stronger regulation)	Ambiguous	Positive	No effect
Supply-side	Hospital supply legislation	Regulation of capital investment	Regulation of hospitals (opening, bed supply, services, high-cost equipment): quotas, authorisation at local and/or central level (higher score = stronger regulation)	Negative	Negative	Negative
Supply-side	Provider price regulation	Regulation of price for physician services	Regulation of prices/fees for physician services: degree of flexibility for charges (higher score = less flexibility, stronger regulation)	Negative	Negative	Negative

Policy and institutions indicators (ct'd)

Category	Institutional aspect	Variable name	Short definition and interpretation	Effect on health spending		
				Expected	Estimated Linear model	Estimated Non-Linear model
Supply-side	Workforce supply legislation	Regulation of physician supply	Existence of quotas for medical students, specialties and location; policies for shortage/redistribution (higher score = stronger regulation)	Ambiguous	Positive	No effect
Supply-side	Hospital supply legislation	Regulation of capital investment	Regulation of hospitals (opening, bed supply, services, high-cost equipment): quotas, authorisation at local and/or central level (higher score = stronger regulation)	Negative	Negative	Negative
Supply-side	Provider price regulation	Regulation of price for physician services	Regulation of prices/fees for physician services: degree of flexibility for charges (higher score = less flexibility, stronger regulation)	Negative	Negative	Negative
Supply-side	Provider price regulation	Regulation of price for hospital services	Regulation of prices for hospital services: degree of flexibility for setting charges (higher score = less flexibility, stronger regulation)	Negative	Negative	Negative
Supply-side	Provider price regulation	Regulation of pharmaceutical price	Regulation of pharmaceutical prices: degree of flexibility that companies have to set their prices (higher score = less flexibility, stronger regulation)	Negative	No effect	No effect
Supply-side	Provider price regulation	Regulation of prices charged to third-party	Regulation of prices/fees paid to providers by third-party payers	Negative	No effect	No effect
Supply-side	Budget caps	Stringency of budget constraint	Expenditure targets or strict health budget and their allocation levels; consequences of budget constraint, including waiting times and compensation from providers to NHS/SHI (higher score = stronger presence and effects of budgets)	Negative	No effect	No effect
Supply-side	Budget caps	Control of volume	Monitoring, regulations and controls on volumes of care: activity volume, monitoring of guideline adherence, drugs advertising to consumers, physician payment reduced according to exceeded volume targets (higher score = stronger controls)	Negative	Positive	Positive
Demand-side	Gatekeeping	Gatekeeping	Requirement/incentives to register with primary care physician and/or referral to secondary care (higher score = more stringent gatekeeping)	Negative	No effect	No effect
Demand-side	Cost-sharing	Depth of basic insurance	Basic primary services coverage with or without copays for 10 care functions (higher score = wider scope and more depth of coverage)	Ambiguous	Positive	Positive

Econometric specifications

Model 1: traditional determinants of spending (income, age, prices and technology/quality), time and country-specific effects – *FE estimation*

$$\log(H_{i,t}) = \alpha + a \cdot \log(y_{i,t}) + b \cdot dep_{i,t} + c \cdot \log(r_{i,t}) + d \cdot \log(Q_{i,t}) + e_i + f_t + u_{i,t}$$

Model 2: country-specific effects replaced by time-invariant policy and institutional variables ($k = 20$) – *pooled OLS estimation*

$$\log(H_{i,t}) = \alpha + a \cdot \log(y_{i,t}) + b \cdot dep_{i,t} + c \cdot \log(r_{i,t}) + d \cdot \log(Q_{i,t}) + \sum_k \delta^k P_i^k + f_t + u_{i,t}$$

Model 3: non-linearities through interactions between the vector of policy and institutions and all other explanatory variables – *non-linear LS estimation*

$$\log(H_{i,t}) = \alpha + \left(1 + \sum_k \delta^k P_i^k\right) \cdot \left[a \cdot \log(y_{i,t}) + b \cdot dep_{i,t} + c \cdot \log(r_{i,t}) + d \cdot \log(Q_{i,t}) + f_t\right] + u_{i,t}$$

Baseline results:

Public health spending per capita

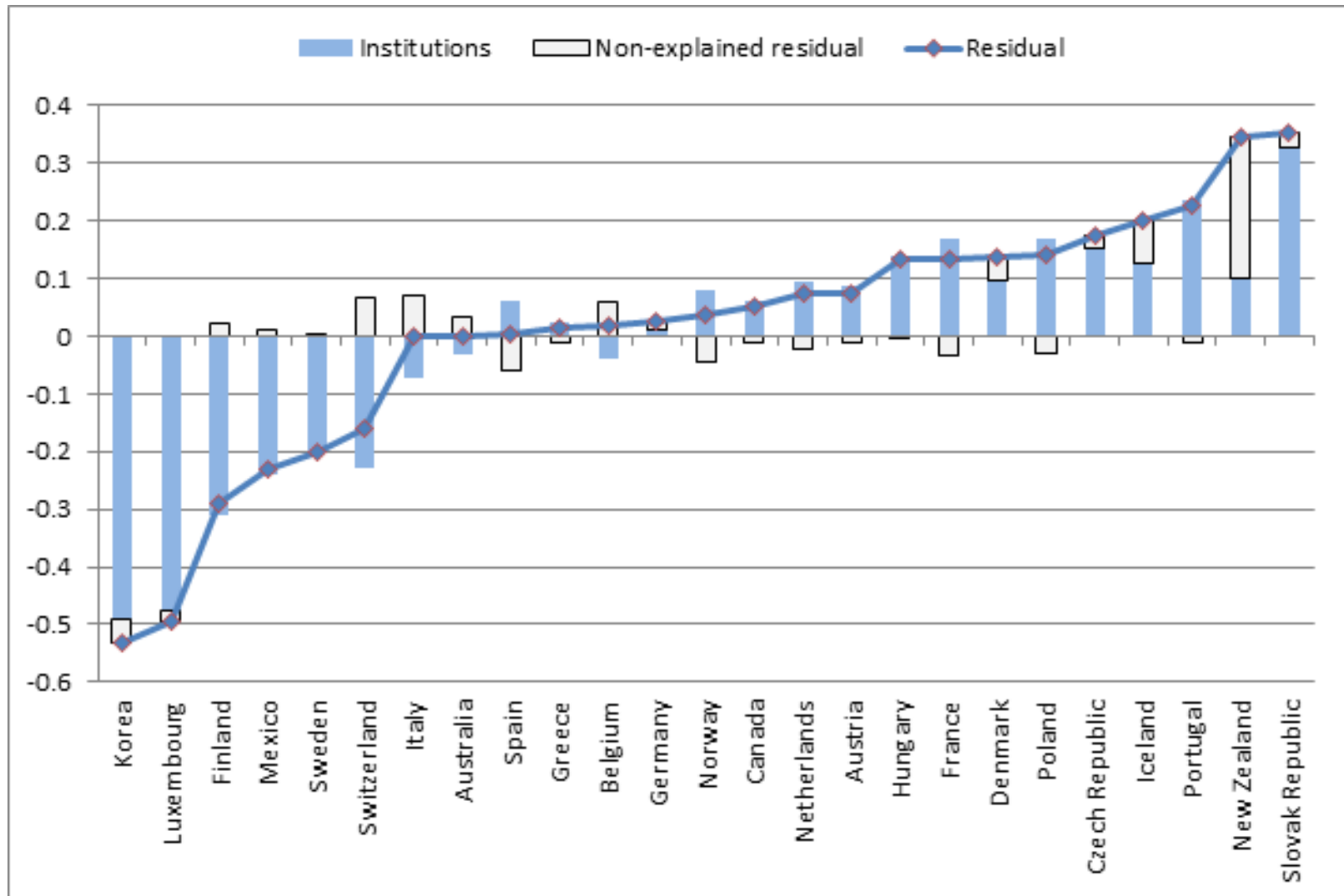
Similar results for:

Total health spending

Indicators added one-by-one

<i>Dependent variable: log of real Public Health Expenditures per capita</i>	(1) Linear FE	(2) Pooled OLS with Institutions	(3) Non-Linear with Institutions
Log of GDP per capita	0.922*** (0.14)	1.277*** (0.07)	1.343*** (0.05)
Dependency ratio	0.026*** (0.01)	0.023*** (0.00)	0.027*** (0.00)
Log relative Health prices	-0.865*** (0.09)	-1.016*** (0.09)	-1.067*** (0.09)
Quality effect	-0.003 (0.00)	0.015*** (0.00)	0.015*** (0.00)
Physician payment		-0.094*** (0.02)	-0.039*** (0.01)
Hospital payment		-0.013 (0.02)	0.004 (0.01)
Incentives for quality		0.146*** (0.03)	0.056*** (0.01)
Choice among providers		0.008 (0.02)	0.006 (0.01)
User choice of insurer		0.119 (0.08)	0.064*** (0.02)
Lever		-0.096 (0.07)	-0.053** (0.02)
Regulation of physician supply		0.049** (0.02)	-0.012 (0.01)
Regulation of capital investment		-0.050*** (0.01)	-0.019*** (0.00)
Regulation of price for physician services		-0.068*** (0.02)	-0.012** (0.01)
Regulation of price for hospital services		-0.064*** (0.01)	-0.027*** (0.01)
Regulation of pharmaceutical price		-0.002 (0.02)	0.005 (0.00)
Regulation of prices charged to third-party		0.043 (0.04)	0.006 (0.01)
Stringency of budget constraint		-0.063 (0.04)	-0.019 (0.01)
Control of volume		0.049*** (0.01)	0.023*** (0.00)
Gatekeeping		0.004 (0.03)	0.015 (0.01)
Depth of basic insurance		0.153*** (0.02)	0.064*** (0.01)
Definition of benefit basket		-0.065*** (0.02)	-0.024*** (0.01)
Public health objectives		0.076** (0.04)	0.020* (0.01)
Use of health technology assessment		0.020 (0.05)	0.026* (0.02)
Degree of decentralisation		-0.037 (0.03)	-0.025** (0.01)
Constant	-7.204*** (1.46)	-10.961*** (0.62)	-11.703*** (0.50)
Country Fixed Effects	Yes	No	No
Year Fixed Effects	Yes	Yes	Yes
Number obs	240	240	240
R2	0.517	0.978	

Institutions explain well and expenditure residuals across countries

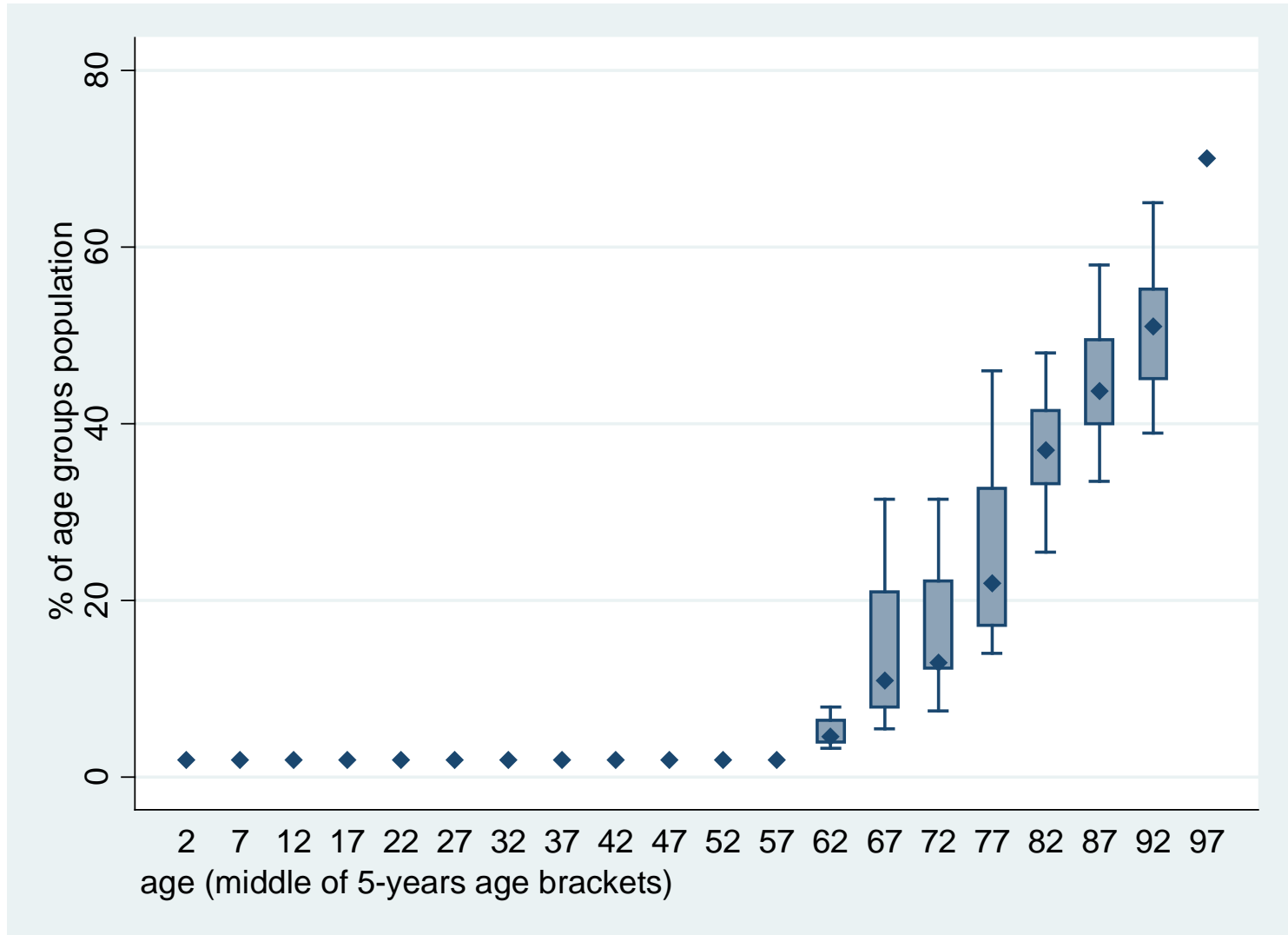


Note: Residuals after age, income, relative prices and technology have been taken into account.

Source: Maisonneuve, Moreno-Serra, Murtin and O. Martins (2016), Health Economics

Drivers of long-term care spending

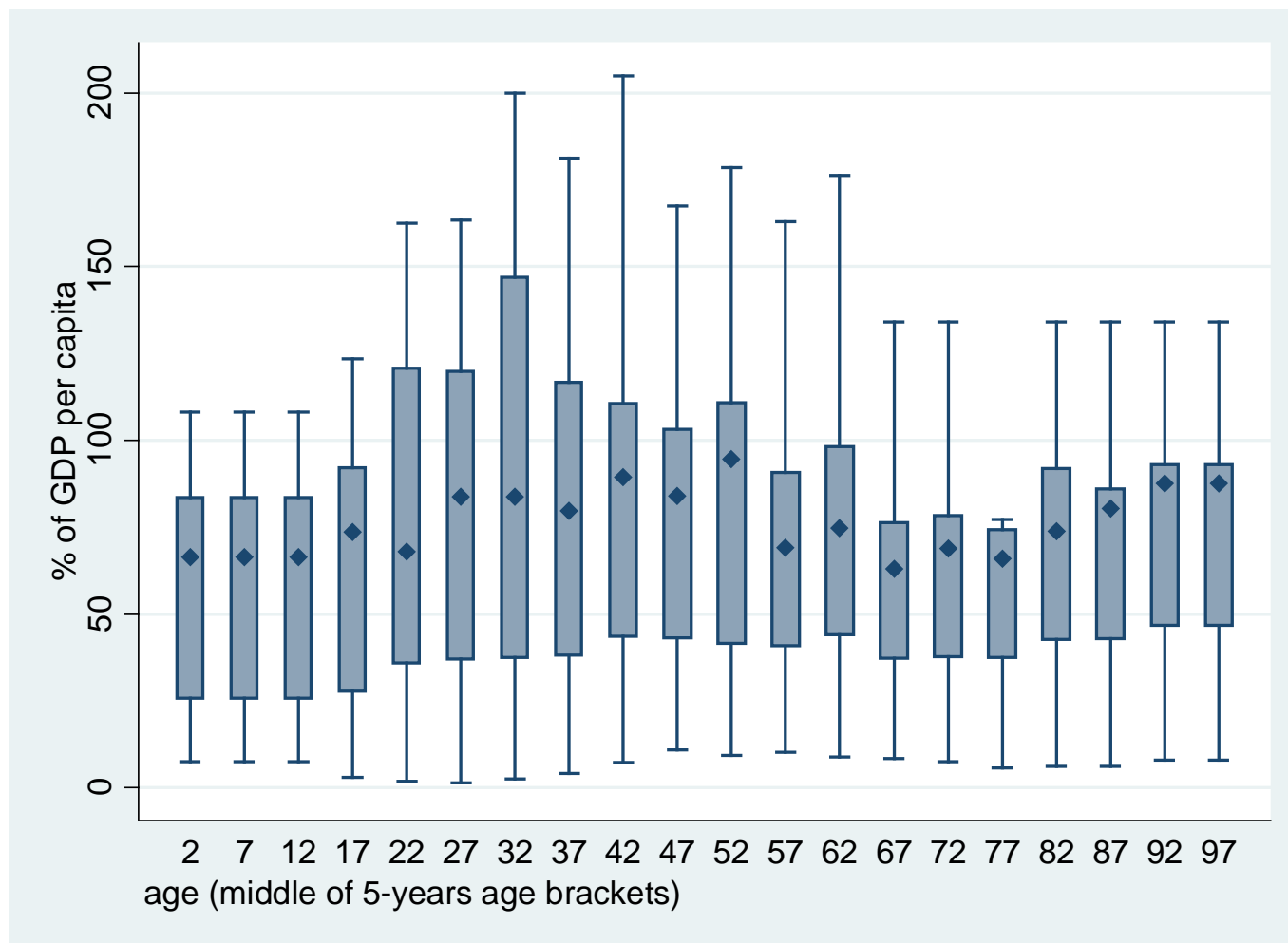
Dependency increases dramatically with Age > 75



Source: EC AWG

Nb: For the projections an average curve was computed

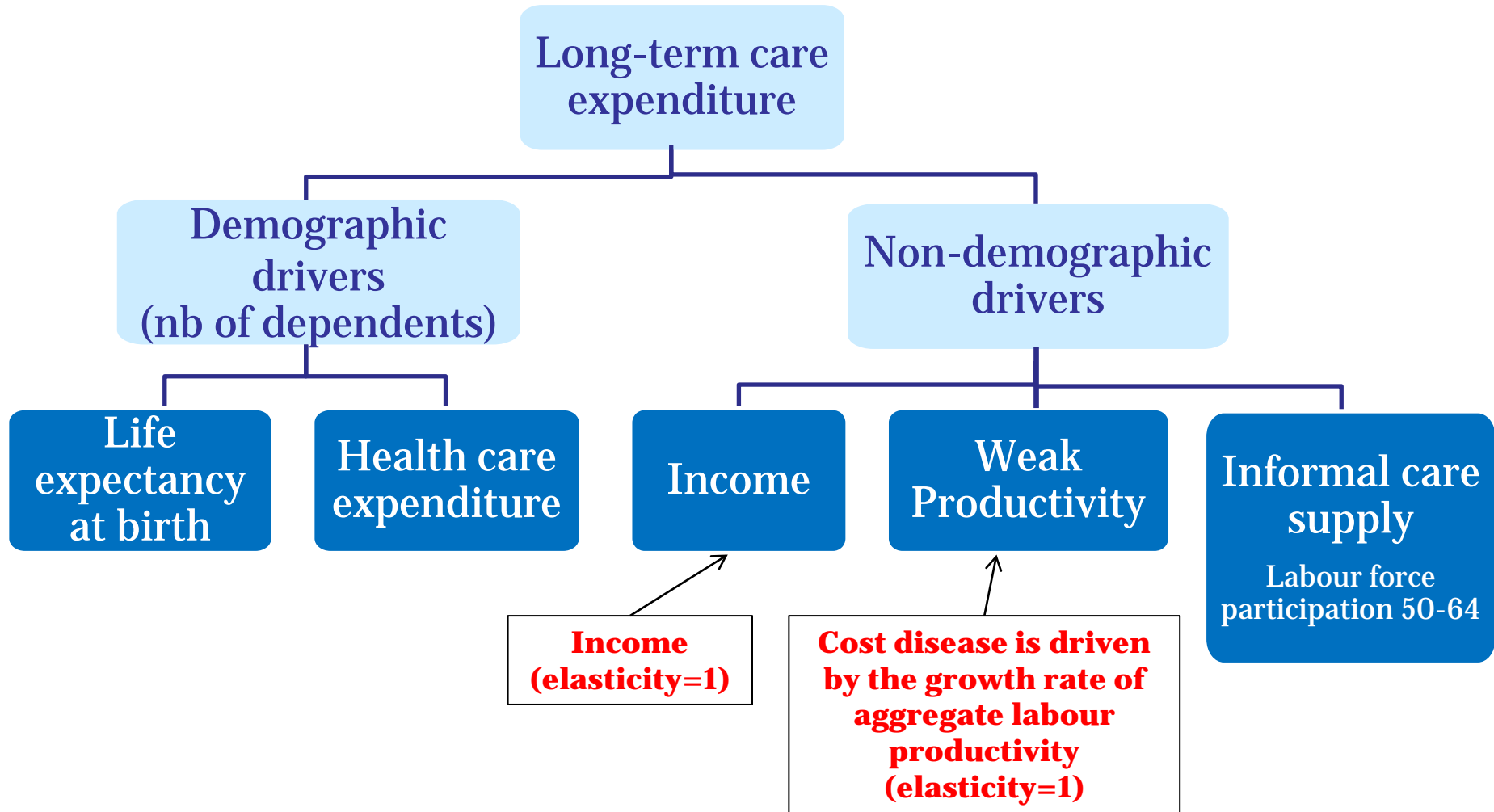
LTC costs/dependent are not related to Age



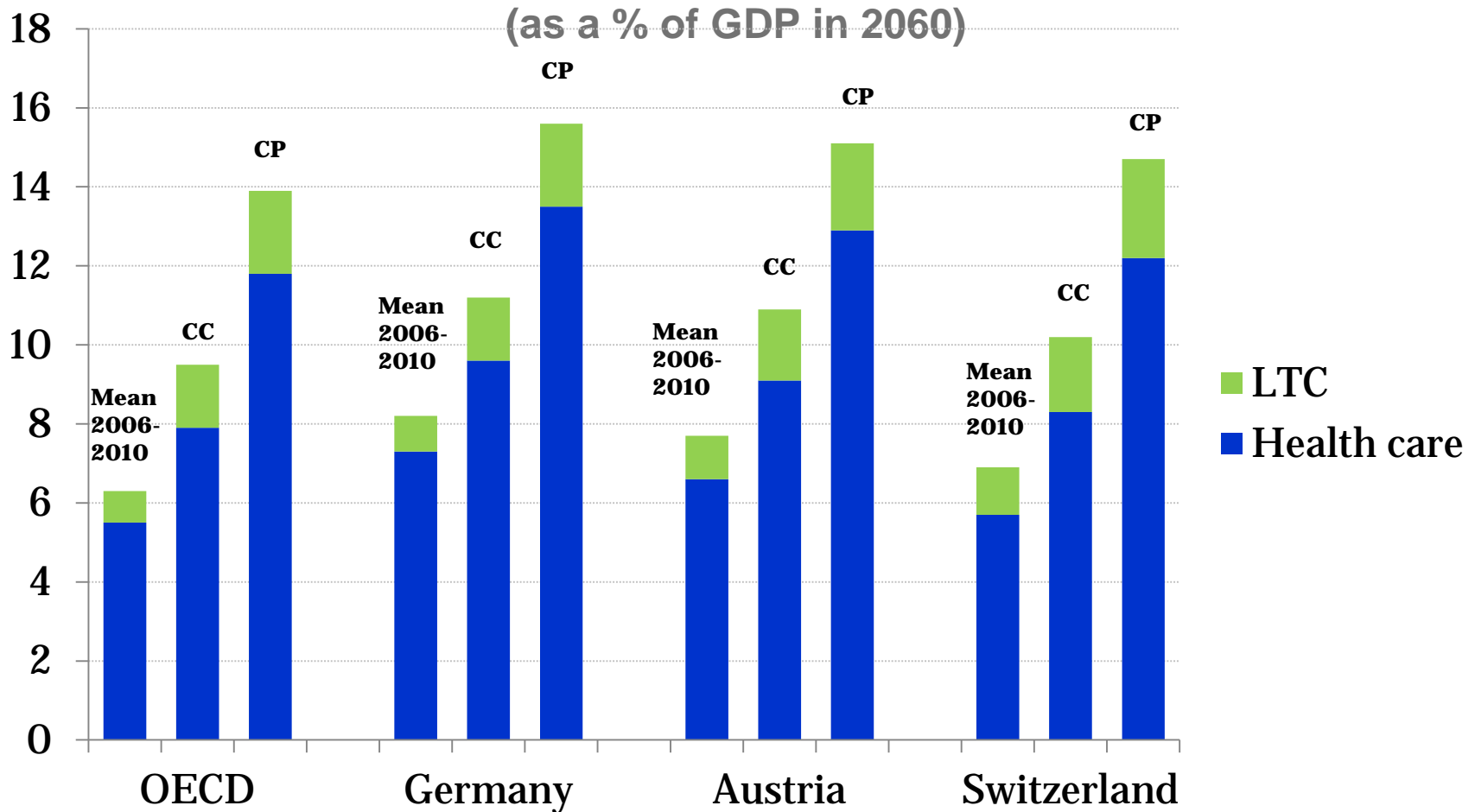
Assumption used in the projections: average constant cost per age by country

Source: EC AWG

Very different drivers for Long-term care



Projected LTC expenditure have a lower impact than Public Health



CP = Cost pressure scenario: healthy ageing, income elasticity=0.8, residual=1.7% per year
CC = Cost containment scenario: healthy ageing, income elasticity=0.8, residual phasing out over the projection period

Convergence mechanism based on differences across countries in health shares to GDP in the base year compared with OECD average

Muchas gracias!
Thank you!