Factors determining long term care expenditures in a multipurpose municipal model: Panel data analyses 1985-2011

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Introduction

- Expenditure on nursing and care services has grown by 61% on a per capita basis between 1985 and 2011

- Our aim is to investigate the causes of this, with a particular interest in the role of demographic changes

Norway

- Population of around 5 million in 2012
- Population density $16/km^2$
- 429 municipalities in 2012
- GDP per capita NOK 549 253 (€ 75 100)
- Unemployment 3%
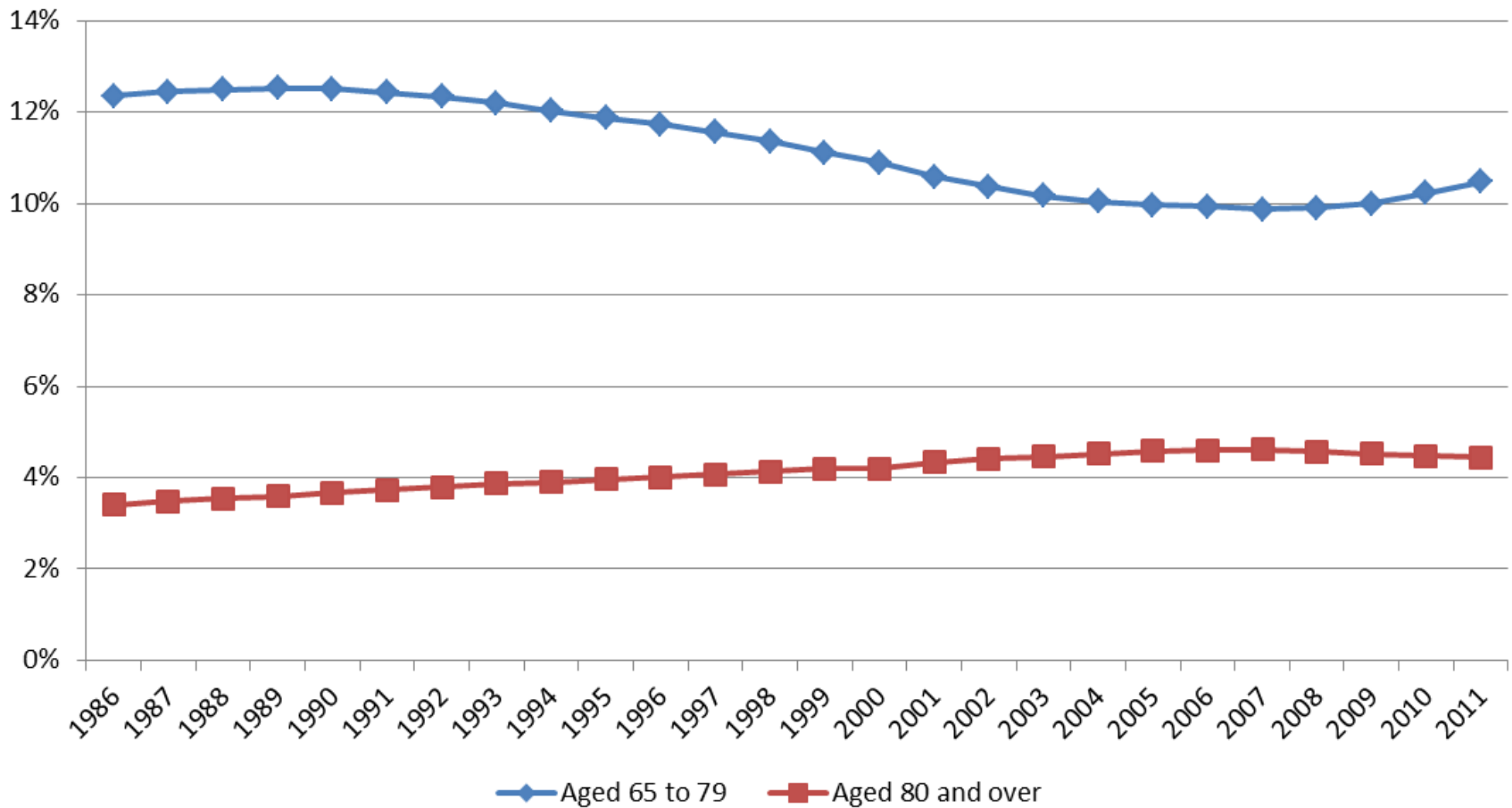- Life Expectancy M: 79 F: 83

Age distribution
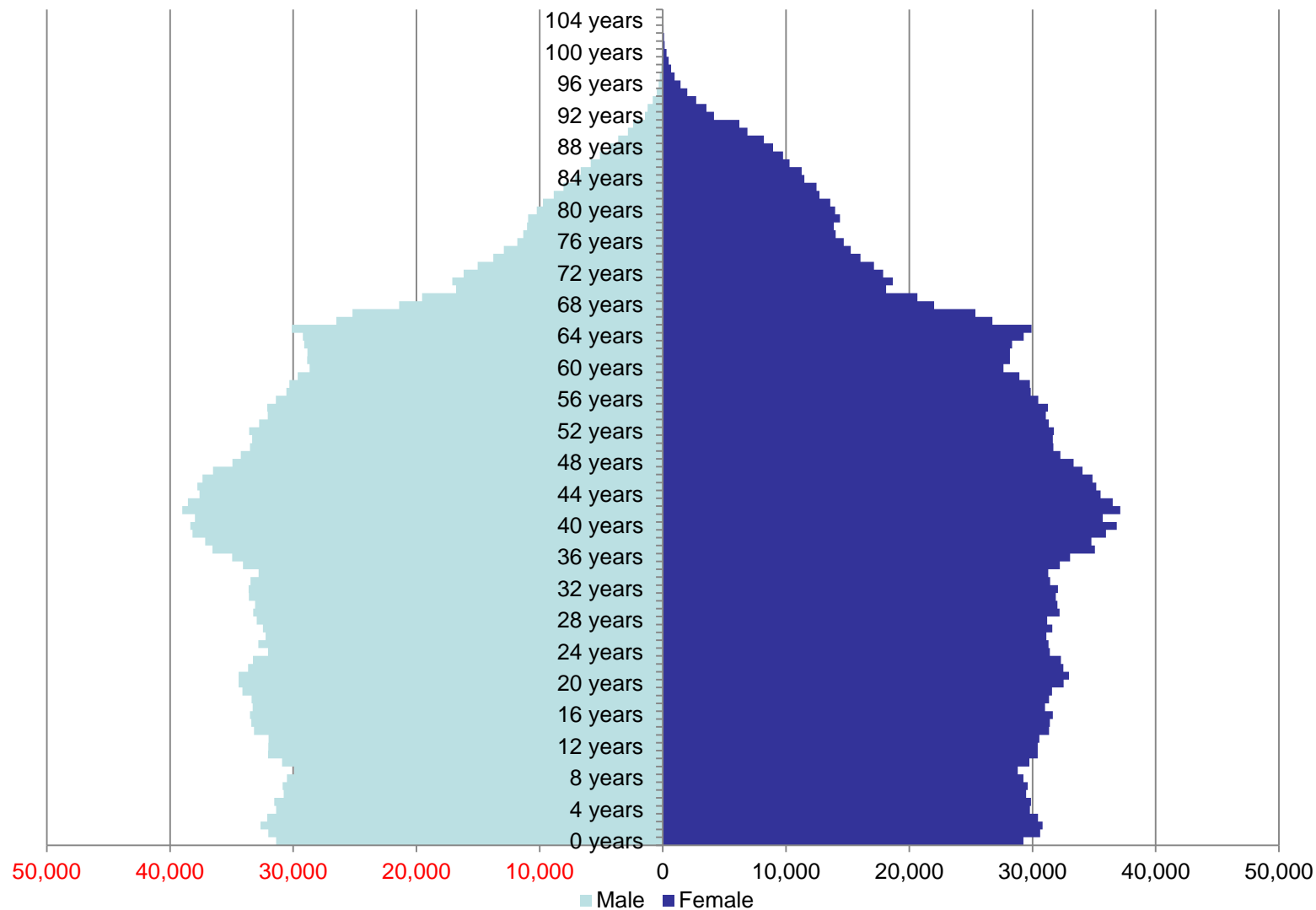
Hypothesis 1

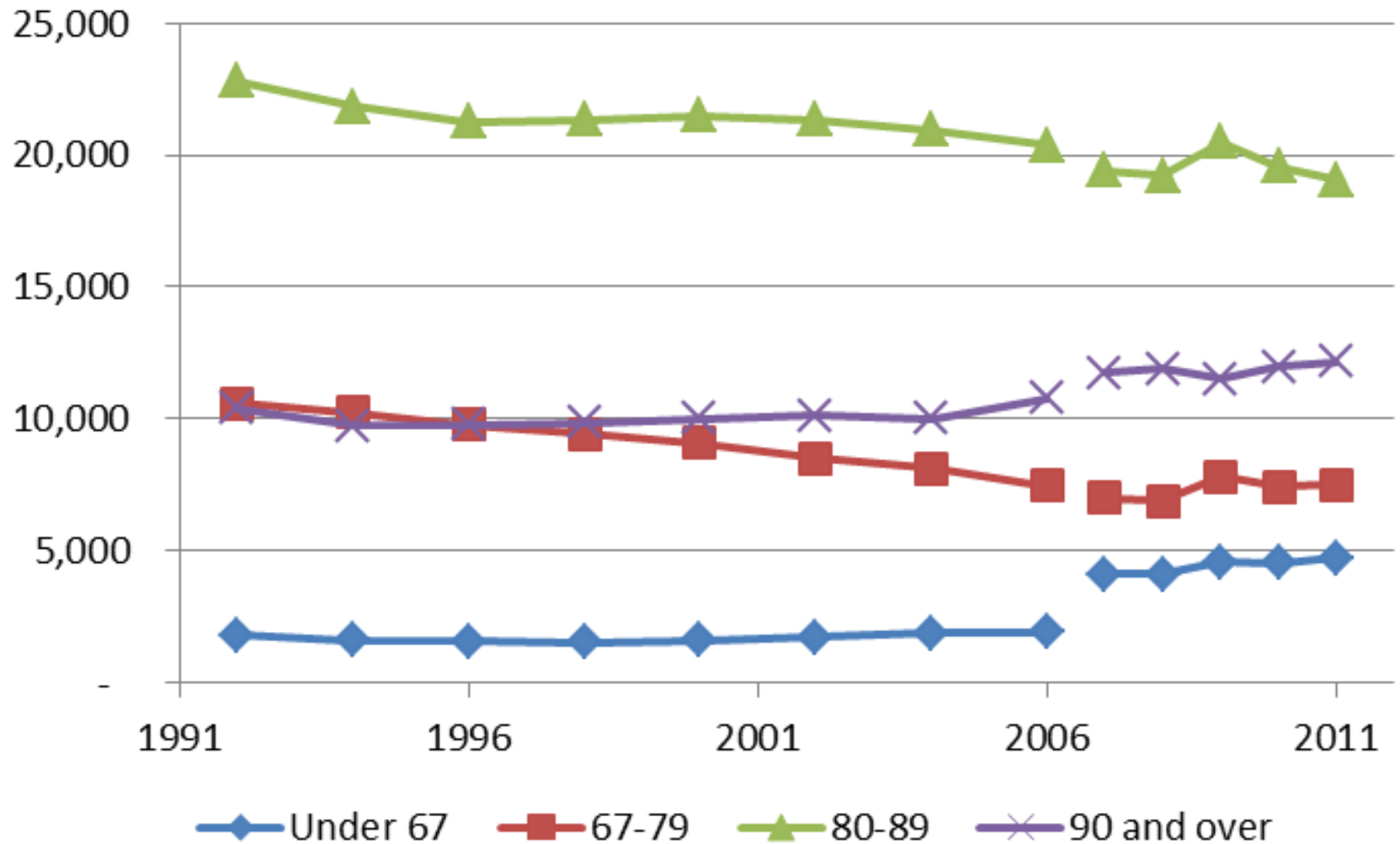- Expenditure on nursing and care has increased due to an ageing population

Hypothesis 2

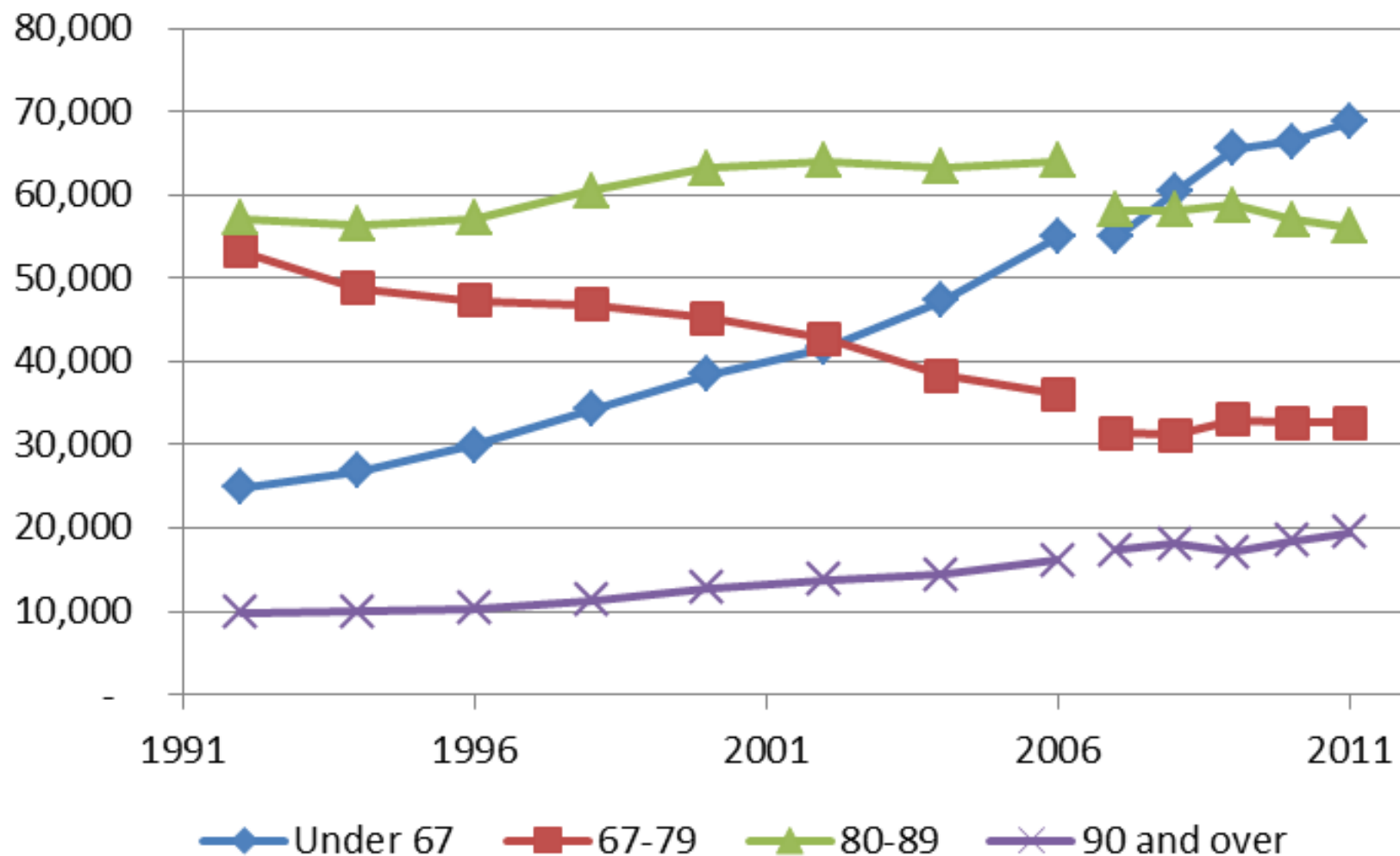- There will be competition for spending between generations

Age distribution of the population
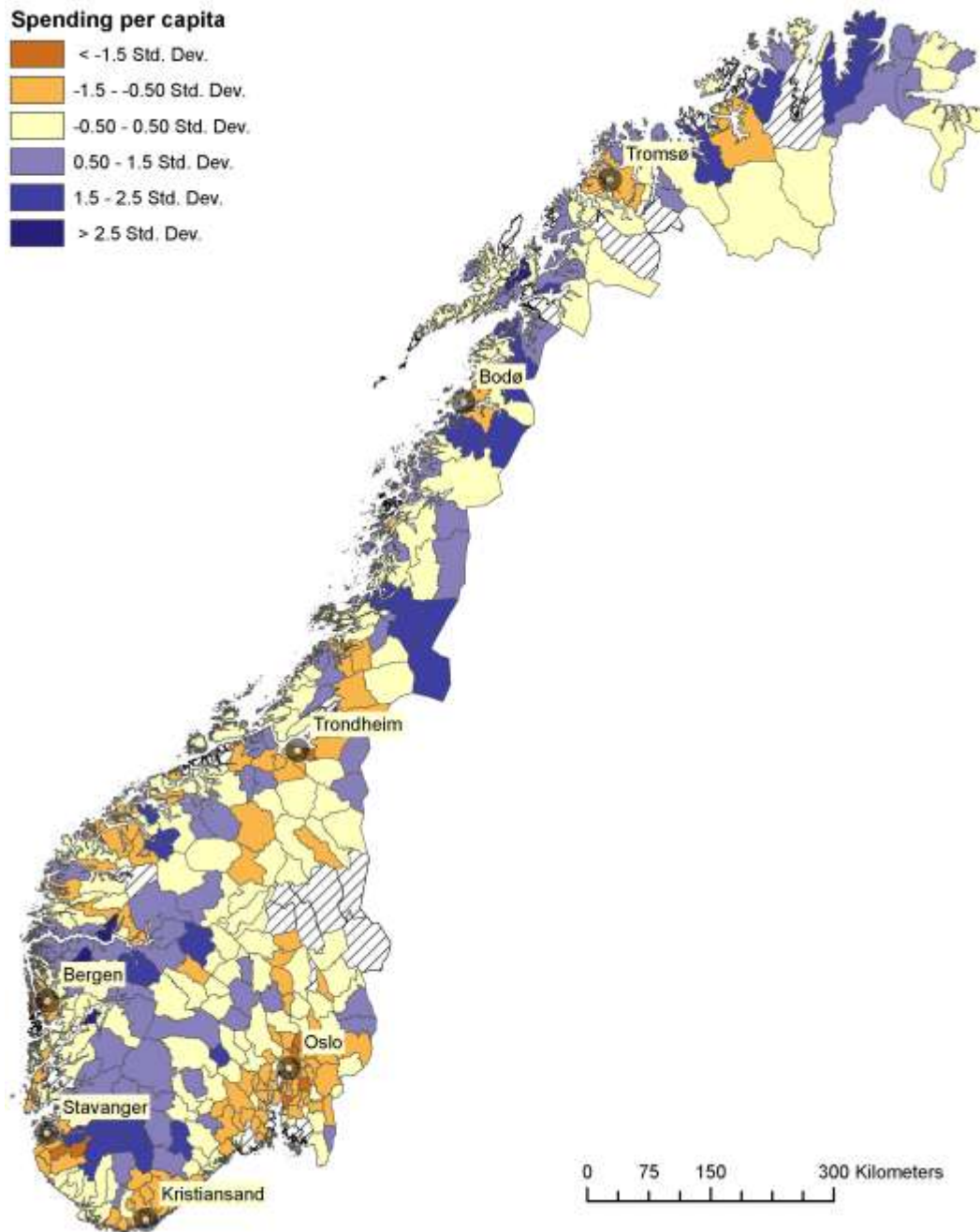
Residents in institutions

Recipients of home care

Hypothesis 3

- Expenditure on nursing and care will be higher in rural areas

Spending per capita

- < -1.5 Std. Dev.
- -1.5 - -0.50 Std. Dev.
- -0.50 - 0.50 Std. Dev.
- 0.50 - 1.5 Std. Dev.
- 1.5 - 2.5 Std. Dev.
- > 2.5 Std. Dev.

0   75   150   300 Kilometers

11
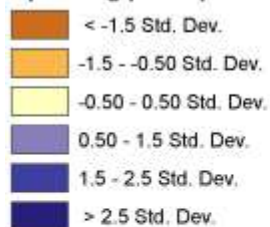
Spending per capita
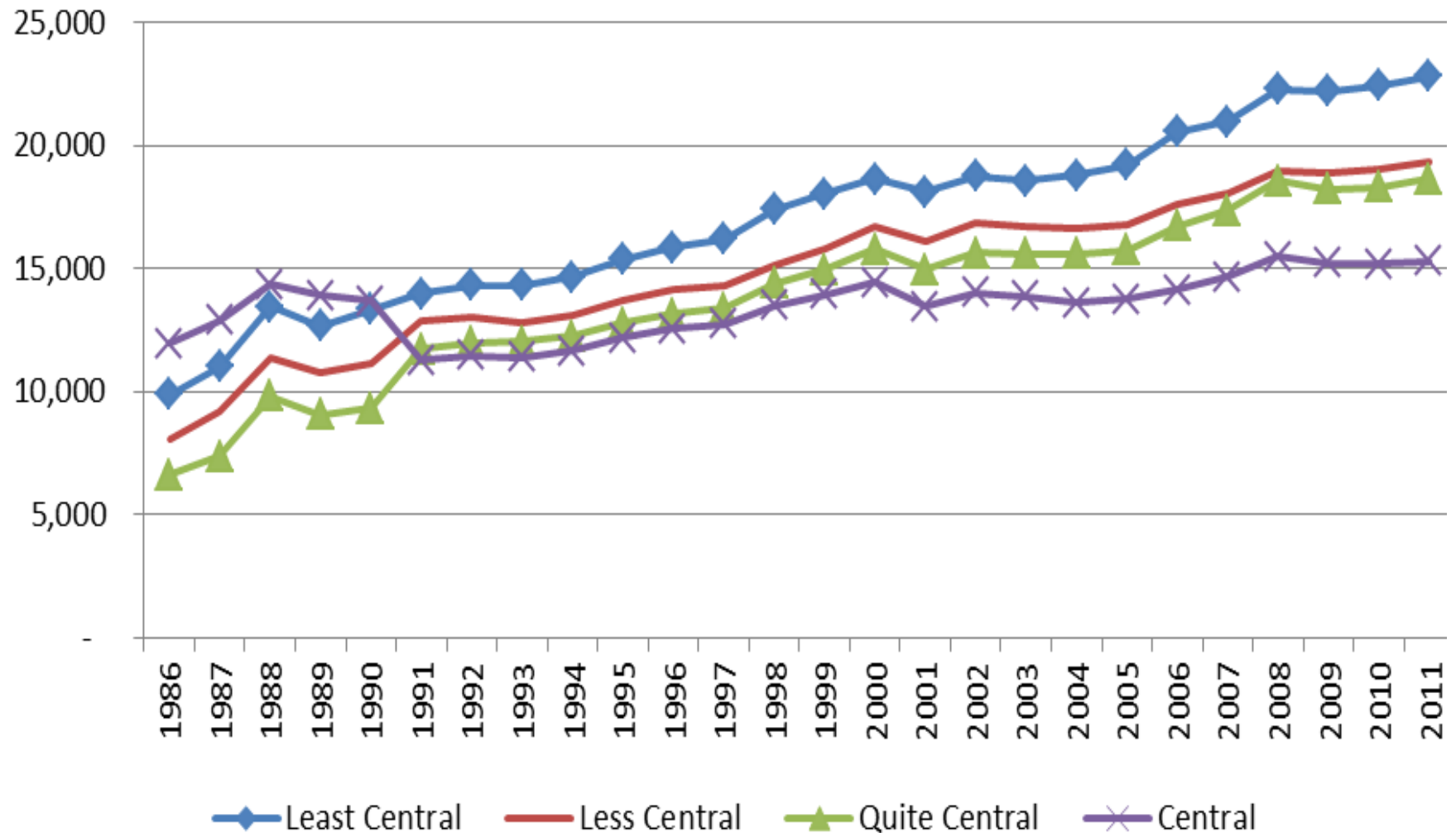
Share age 65-79

Share age 80 and over

Legend: Least Central — Less Central — Quite Central — Central
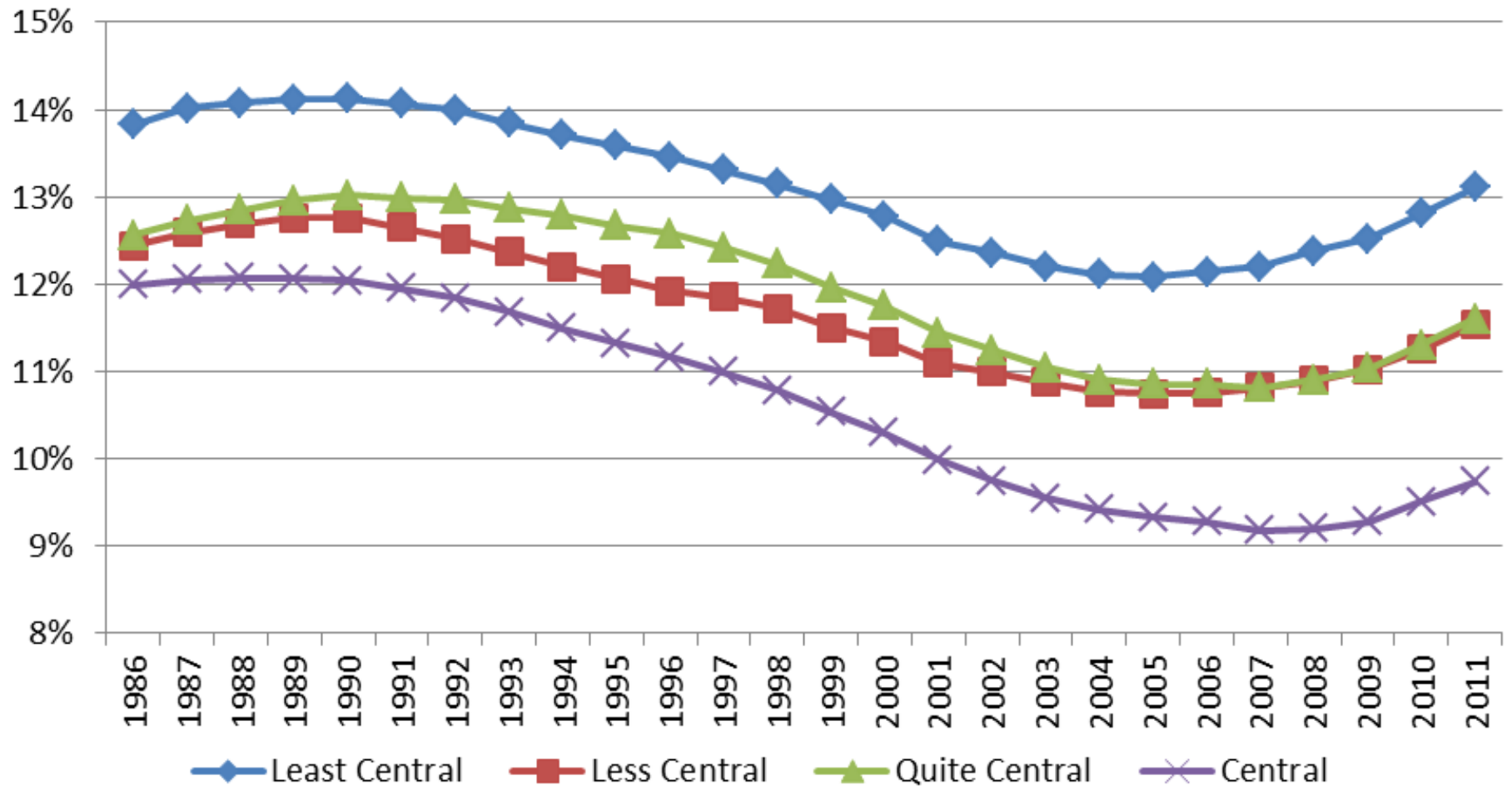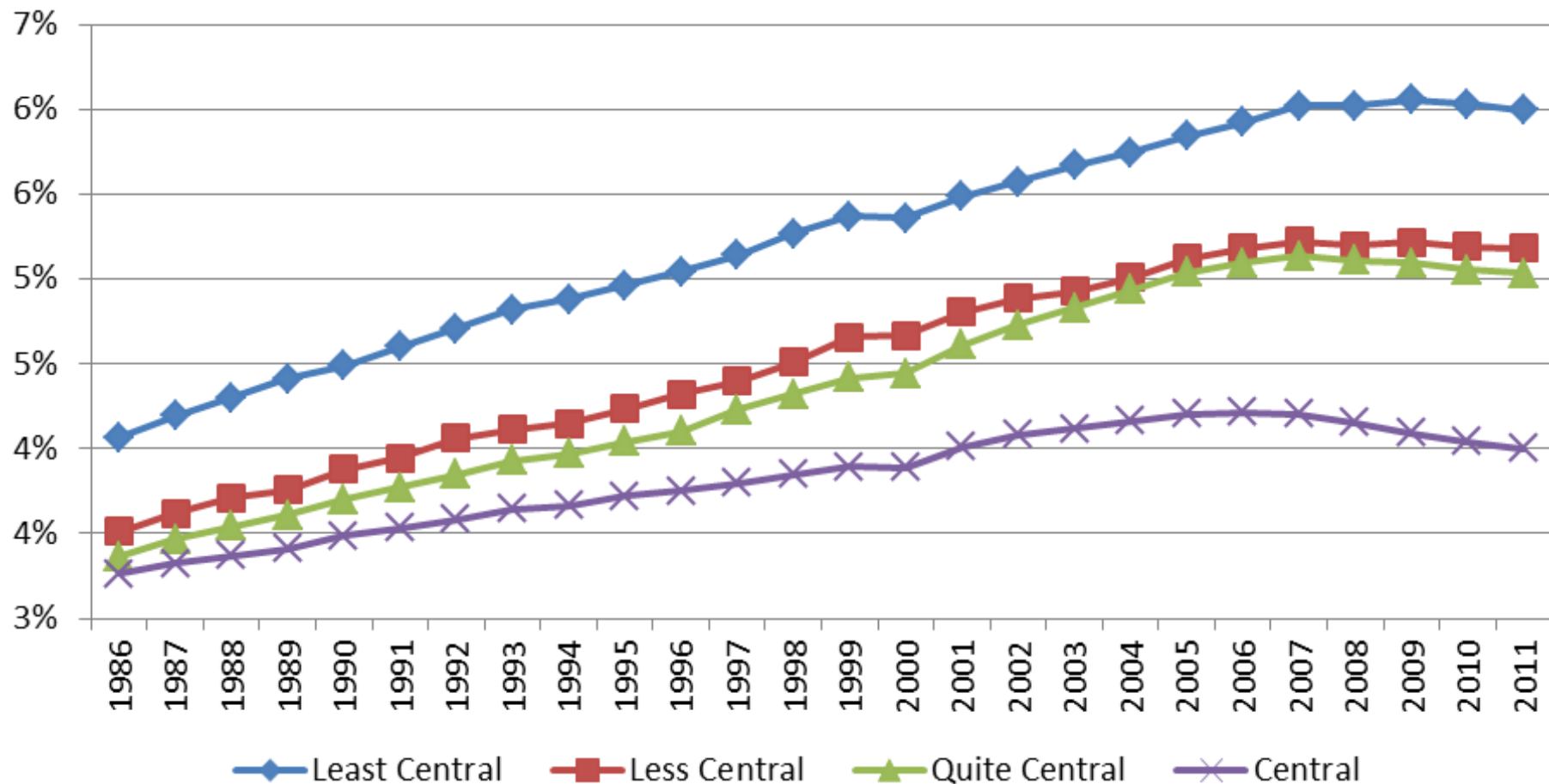
Our data

- Data on 399 municipalities from 1986 to 2011

- Information on the age structure and the death rate

- Some socio-economic data, although only from 2000 to 2011: income, disability pensioners, percentage living alone

- Centrality classification describing the centrality of each municipality

Panel data

- Due to the nature of our data, we use a panel data structure

$$\ln(y_{it}) = x_{it} + \mu_i + \varphi_t + \varepsilon_{it}$$

Variable	M1	M2	M3	M4	M5
Share 0 to 20				-0.0587	-0.0238
				(2.32)	*(0.74)*
Share 65 to 79	0.0314	0.1068	0.1042	0.0802	0.0544
	(-1.67)	*(-3.16)*	*(-3.17)*	*(-4.13)*	*(-4.22)*
Share 80 and over	0.3898	0.1705	0.1623	0.1413	0.0528
	(-19.89)	*(-4.82)*	*(-4.86)*	*(-7.32)*	*(-3.28)*
Share dying			0.0688	0.0387	0.0250
			(-2.42)	*(-1.91)*	*(-1.55)*
Budget per capita*					0.9783
					(-4.65)
Year Dummies	No	Yes	Yes	Yes	Yes
Rsq	0.4733	0.6257	0.6263	0.6445	0.7201

Time invariant regressors

- The random effects model was rejected, we therefore use fixed effects regression

- This prevents us from identifying the effects of time invariant regressors

- We are interested in the coefficients attached to our centrality measure

- We use Hausman-Taylor regression to do this

Variable	Coefficient	(Std. Err.)
TV Exogenous		
Share 0 to 20	-0.012	(0.002)
TV Endogenous		
Share 65 to 79	0.015	(0.002)
Share 80 and over	0.029	(0.004)
TI Exogenous		
SSB Cent 1	-0.051	(0.037)
SSB Cent 2	-0.133	(0.032)
SSB Cent 3	-0.258	(0.027)
Intercept	2.233	(0.082)

Preliminary conclusions

- Ageing appears to contribute to rising expenditures on nursing and care

- There appears to be competition between generations for funds

- Expenditure seems to be highest in the most remote areas, even when controlling for differences in age structure

Next steps

- Test for strategic interaction between municipalities using spatial panel data models

- Combine aggregate data with micro data for a more complete picture

Thank you for you attention