Subnational inequalities in years of life lost and socioeconomic associations in pre-pandemic Europe, 2009-2019: A burden of disease study

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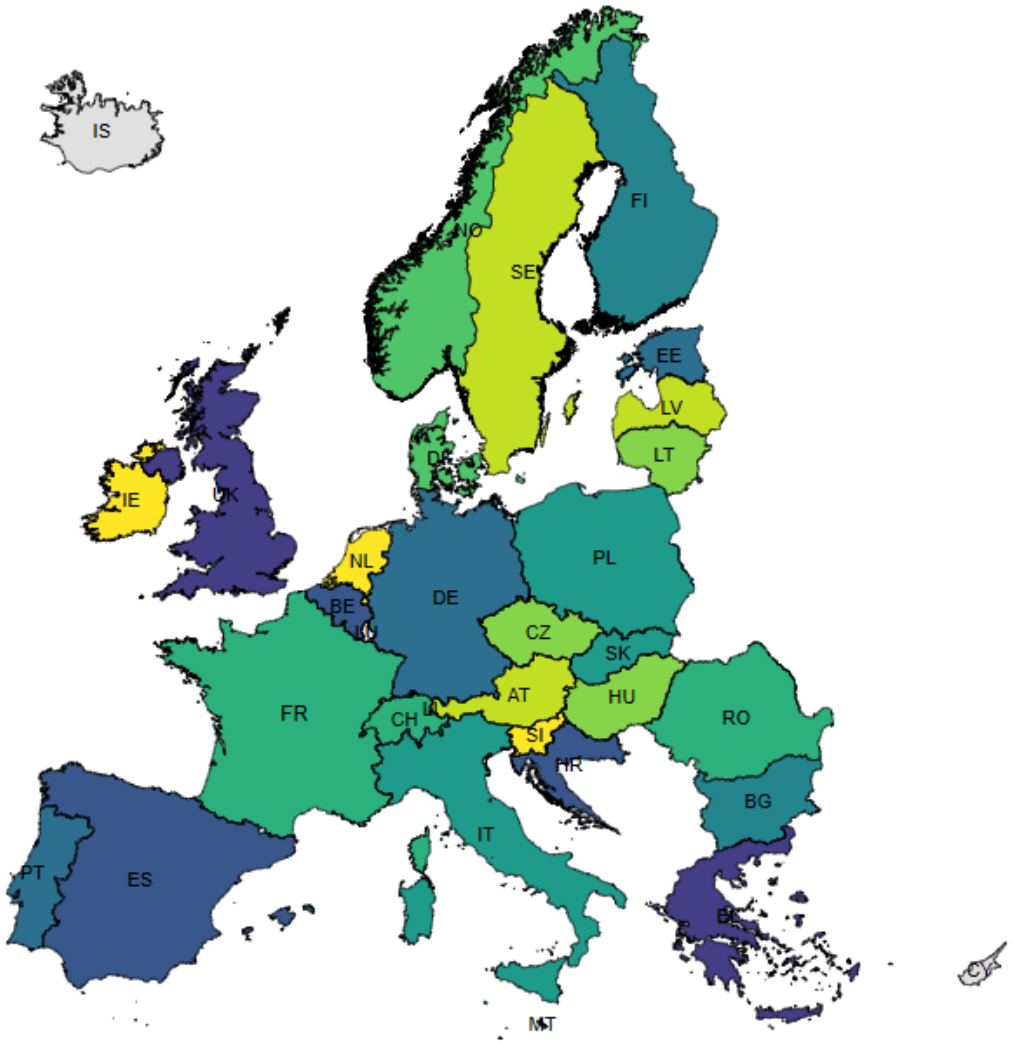

european burden-eu of disease network

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Background

The factors contributing to this inequality are complex and multifaceted, and include differences in socioeconomic status.

Although European countries aim for convergence in health status, few comparative studies have addressed health inequalities at the sub-national level.

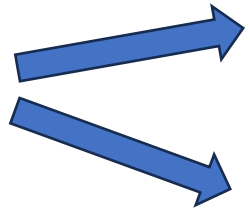
Objective

To determine subnational differences in YLLs, the level of relative and absolute subnational geographical inequalities in YLLs and the association of socioeconomic factors with all-cause YLLs by regions of EEA countries.

Methods

eurostat

IHME



NUTS 2 and 3

EuroVoc

YLL

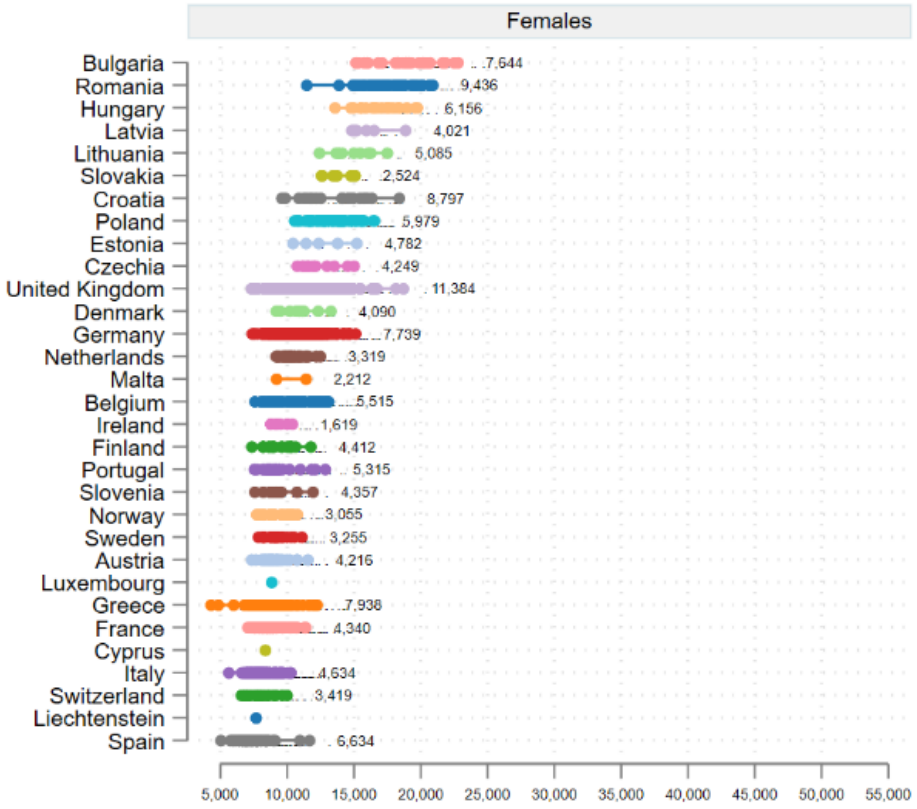
Age-standardized YLL

Gini Coefficient

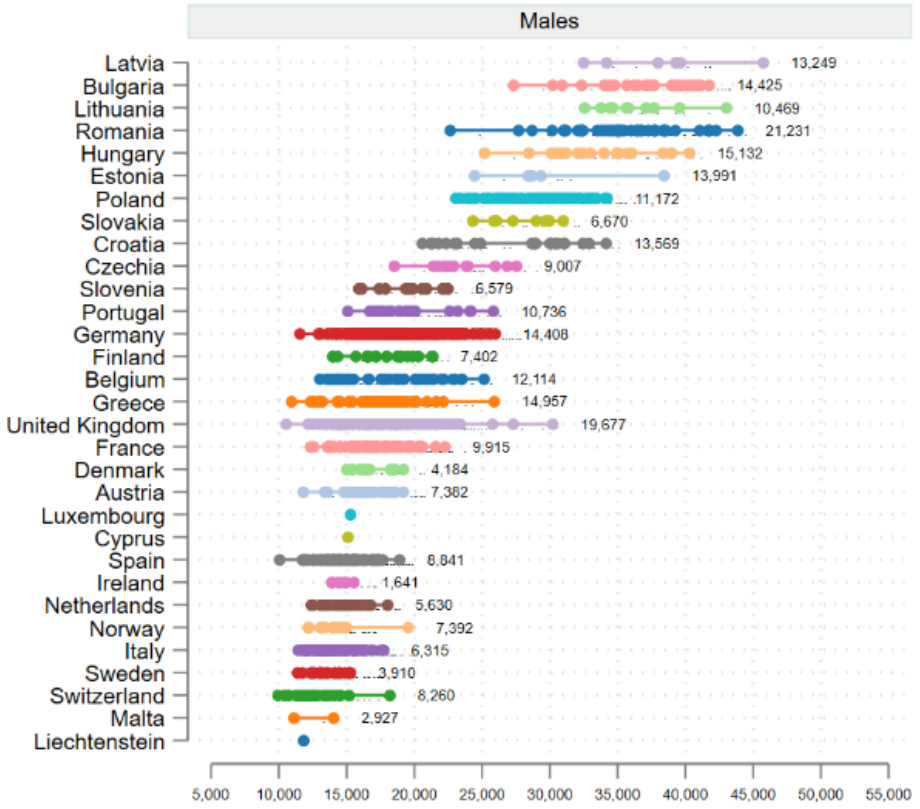
AAPC

Mixed-effects negative binomial regression models

Results



Age standardised YLL rate per 100 000 population
[difference between highest & lowest value]



Age standardised YLL rate per 100 000 population
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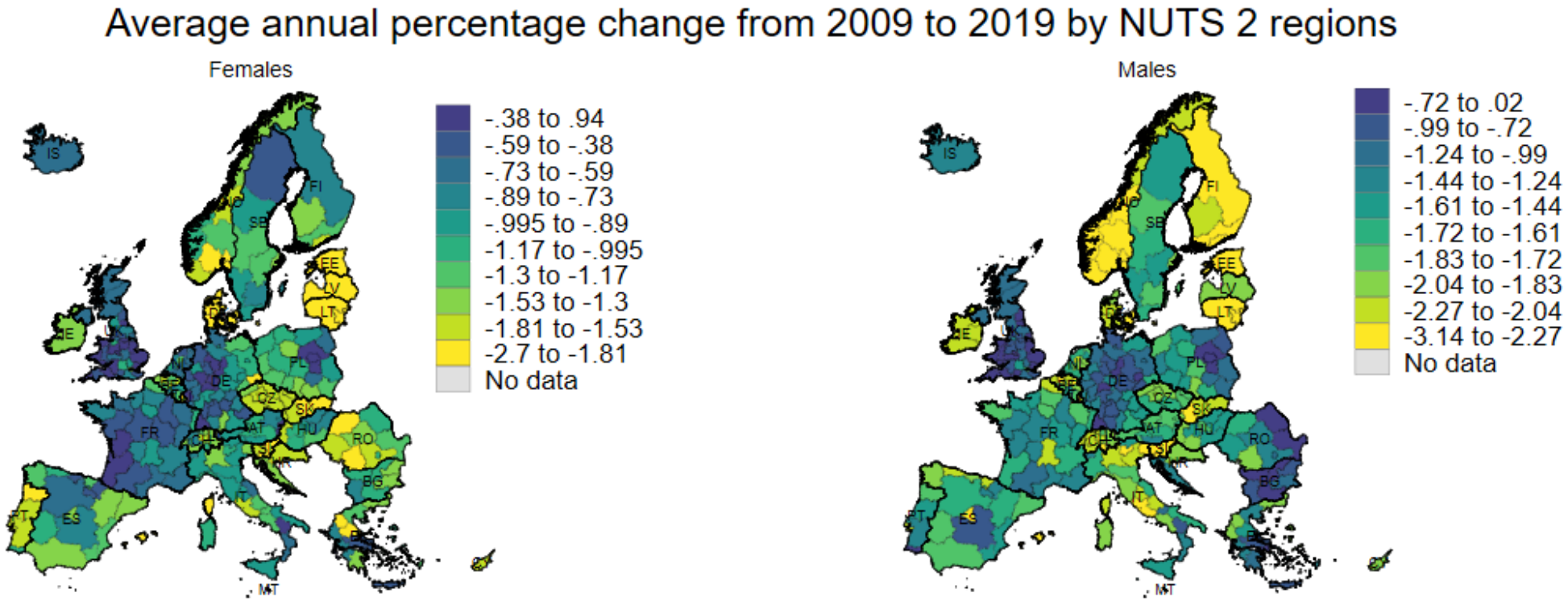
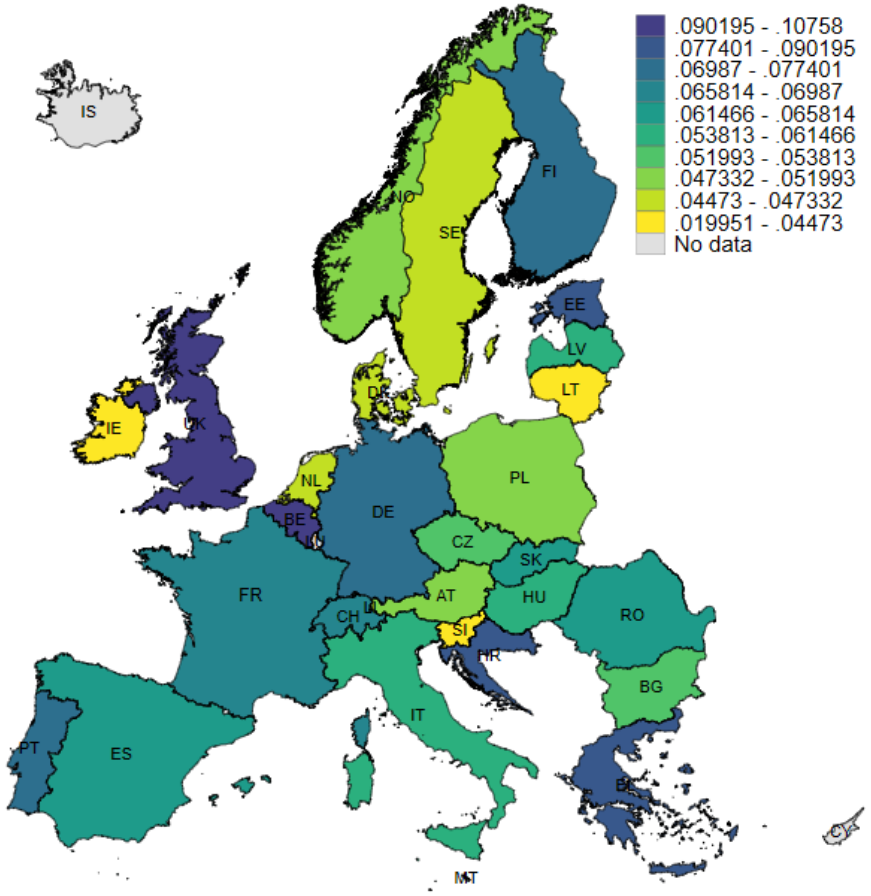
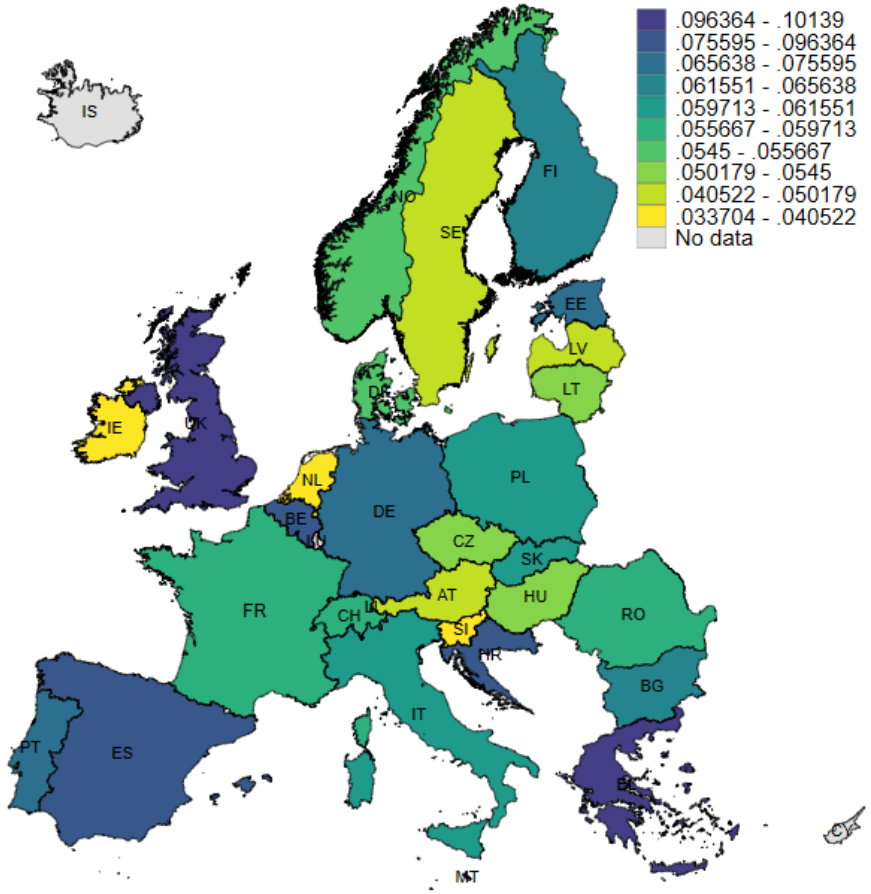

Average annual percentage change from 2009 to 2019 by NUTS 2 regions
Females
-.38 to .94
-.59 to -.38
-.73 to -.59
-.89 to -.73
-.995 to -.89
-1.17 to -.995
-1.3 to -1.17
-1.53 to -1.3
-1.81 to -1.53
-2.7 to -1.81
No data
Males
-.72 to .02
-.99 to -.72
-1.24 to -.99
-1.44 to -1.24
-1.61 to -1.44
-1.72 to -1.61
-1.83 to -1.72
-2.04 to -1.83
-2.27 to -2.04
-3.14 to -2.27
No data

Results: Within-country disparities

Females



Males



Results: Educational Attainment

Females

Less than upper secondary education [ISCED0-4] (%)		IRR (95% CI)	P value
EEA (all regions)			
Quintile 1 (reference)	37 to 55%	1·00	
Quintile 2	55 to 62%	1·06 (1·03 to 1·09)	<0·001
Quintile 3	62 to 69%	1·10 (1·06 to 1·14)	<0·001
Quintile 4	69 to 76%	1·13 (1·06 to 1·19)	<0·001
Quintile 5 (high)	76 to 87%	1·19 (1·13 to 1·26)	<0·001

Males

Less than upper secondary education [ISCED0-4] (%)		IRR (95% CI)	P value
EEA (all regions)			
Quintile 1 (reference)	42 to 62%	1·00	
Quintile 2	63 to 68%	1·06 (1·03 to 1·09)	<0·001
Quintile 3	68 to 74%	1·08 (1·03 to 1·12)	<0·001
Quintile 4	74 to 79%	1·14 (1·10 to 1·18)	<0·001
Quintile 5 (high)	80 to 91%	1·22 (1·16 to 1·28)	<0·001

Results: Household Income

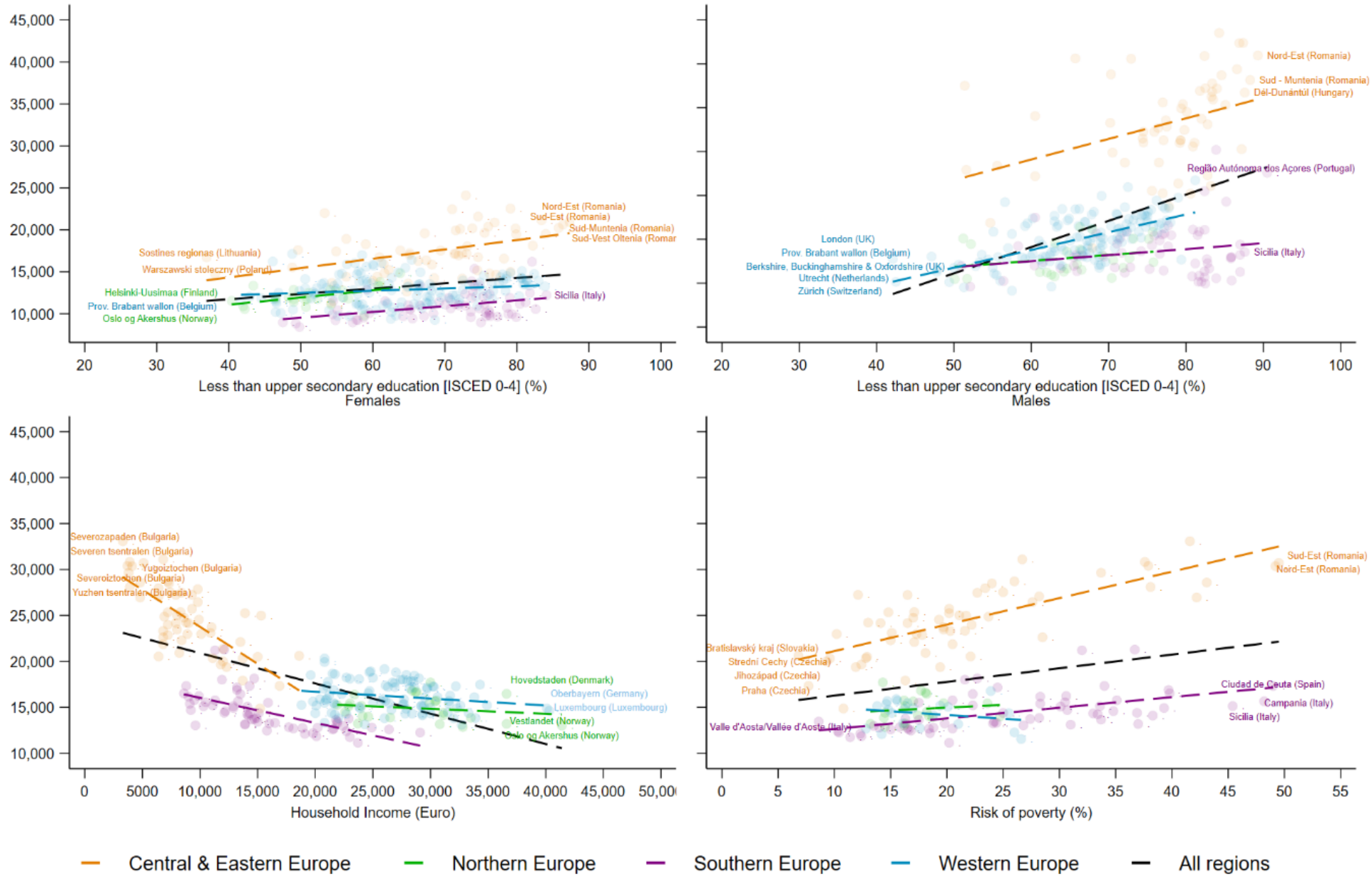
Household income (Euro)		**IRR (95% CI)**	**P value**
EEA (all regions)			
Quintile 1 (low)	< 9,900	1·39 (1·23 to 1·58)	<0·001
Quintile 2	9,900 to 16,900	1·28 (1·20 to 1·36)	<0·001
Quintile 3	16,900 to 22,900	1·13 (1·08 to 1·19)	<0·001
Quintile 4	22,900 to 28,400	1·07 (1·06 to 1·09)	<0·001
Quintile 5 (reference)	> 28,400	1·00	

Results: Risk of Poverty of social Exclusion

Risk of Poverty or social exclusion (%)		**IRR (95% CI)**	**P value**
EEA (all regions)			
Quintile 1 (reference)	< 15%	1·00	
Quintile 2	15 to 18%	1·03 (0·99 to 1·07)	0·109
Quintile 3	18 to 22%	1·03 (0·99 to 1·08)	0·118
Quintile 4	22 to 30%	1·08 (1·03 to 1·14)	0·004
Quintile 5 (high)	> 30%	1·18 (1·12 to 1·25)	<0·001

Results: Rural vs Urban

EEA Region	Urban and Rural Areas (by NUTS 3)	IRR (95% CI)	P value
Central & Eastern Europe	Urban (ref)	1·00	
	Intermediate	**1·09 (1·02 to 1·17)**	**0·012**
	Rural	**1·12 (1·04 to 1·21)**	**0·005**
Northern Europe	Urban (ref)	1·00	
	Intermediate	1·04 (0·98 to 1·11)	0·210
	Rural	1·07 (0·99 to 1·16)	0·076
Southern Europe	Urban (ref)	1·00	
	Intermediate	0·98 (0·96 to 1·00)	0·039
	Rural	0·96 (0·89 to 1·04)	0·323
Western Europe	Urban (ref)	1·00	
	Intermediate	0·99 (0·95 to 1·04)	0·820
	Rural	1·05 (1·00 to 1·10)	0·062


45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
20
30
40
50
60
70
80
90
100
Less than upper secondary education [ISCED 0-4] (%)
Females
Nord-Est (Romania)
Sud-Est (Romania)
Sud-Muntenia (Romania)
Sud-Vest Oltenia (Romar
Sostines reglonas (Lithuania)
Warszawski stoleczny (Poland)
Helsinki-Uusimaa (Finland)
Prov. Brabant wallon (Belgium)
Oslo og Akershus (Norway)
Sicilia (Italy)
Less than upper secondary education [ISCED 0-4] (%)
Males
Nord-Est (Romania)
Sud - Muntenia (Romania)
Dél-Dunántúl (Hungary)
Região Autónoma dos Açores (Portugal)
London (UK)
Prov. Brabant wallon (Belgium)
Berkshire, Buckinghamshire & Oxfordshire (UK)
Utrecht (Netherlands)
Zürich (Switzerland)
Sicilia (Italy)
Severozapaden (Bulgaria)
Severen tsentralen (Bulgaria)
Yugoiztochen (Bulgaria)
Severoiztochen (Bulgaria)
Yuzhen tsentralen (Bulgaria)
Hovedstaden (Denmark)
Oberbayern (Germany)
Luxembourg (Luxembourg)
Vestlandet (Norway)
Oslo og Akershus (Norway)
0
5000
10,000
15,000
20,000
25,000
30,000
35,000
40,000
45,000
50,000
Household Income (Euro)
Sud-Est (Romania)
Nord-Est (Romania)
Bratislavský kraj (Slovakia)
Strední Cechy (Czechia)
Jihozápad (Czechia)
Praha (Czechia)
Valle d'Aosta/Vallée d'Aoste (Italy)
Ciudad de Ceuta (Spain)
Campania (Italy)
Sicilia (Italy)
0
5
10
15
20
25
30
35
40
45
50
55
Risk of poverty (%)
Central & Eastern Europe
Northern Europe
Southern Europe
Western Europe
All regions

Discussion

- Low relative within-country geographical inequalities, but high absolute inequality across all EEA countries in 2019, particularly for men
- Rise in relative geographical disparities in age-standardized YLL rates for males across all EEA regions, but a decrease for females
- We found an association between YLLs and socioeconomic factors – income, education and risk of poverty
  - Importance of local governamental policies in investing in socioeconomic determinants of health