



SNIŽOVÁNÍ ZDRAVOTNÍCH NEROVNOSTÍ

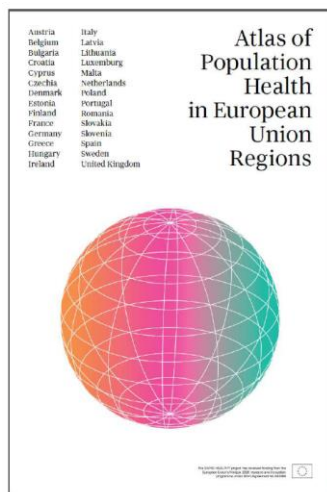
Zdraví v kontextu sociálně ekonomických determinant II.

1. Atlas populačního zdraví - Projekt Euro-Healthy
2. Studijní obor – Sociální epidemiologie

SZÚ, 12. 12. 2017

Dagmar Dzúrová

Michala Lustigová, Dušan Drbohlav, Markéta Seidlová



PROMOTING
POPULATION
HEALTH
AND EQUITY
IN EUROPE

FROM
EVIDENCE
TO
POLICY

GeoQol – oblast výzkumu



- <http://geoqol.natur.cuni.cz/>
- Zdravotní stav populace a jeho prostorová diferenciacce
- Podpora zdraví, zdravotní politika
- Sociální epidemiologie, sociální psychiatrie
- Životní styl a hodnotové orientace v transformačním období
- Kvalita života a zdraví imigrantů
- Genderová problematika, queer geografie
 - <http://queergeography.cz/>
- Výzkum je zaměřen na studium sociálně–prostorových nerovností na různých měřítkových úrovních územního členění, a to na úrovni obcí (v případě velkých měst, pak i na úrovni městských částí) regionů, státu, včetně analýzy pozice v Evropě.

Mezinárodní spolupráce



- H2020, 2015–2017, EURO-HEALTHY
- Shaping **EURO**pean policies to promote **HEALTH** equit**Y**
- Metodologie konstruktů populačního zdravotního indexu k hodnocení zdraví a kvality života evropských populací



UC	Universidade de Coimbra
ASPB	Agencia de Salut Publica de Barcelona
DH-PHE	Public Health England
UPO	Universite Paris Ouest Nanterre la Defance
IST	Instituto Superior Técnico
UM	Universiteit Maastricht
UCL	University College of London
KI	Karolinska Institutet
BHT	Beuth-Hochschule Fuer Technik Berlin
CUP	Univerzita Karlova V Praze
UoA	Ethniko Kai Kapodistriako Panepistimio Athinon
CSI	Consorzio Per il Sistema Informativo
EUBA	Ekonomicna Univerzita V Bratislave
VUB	Vrije Universiteit Brussel

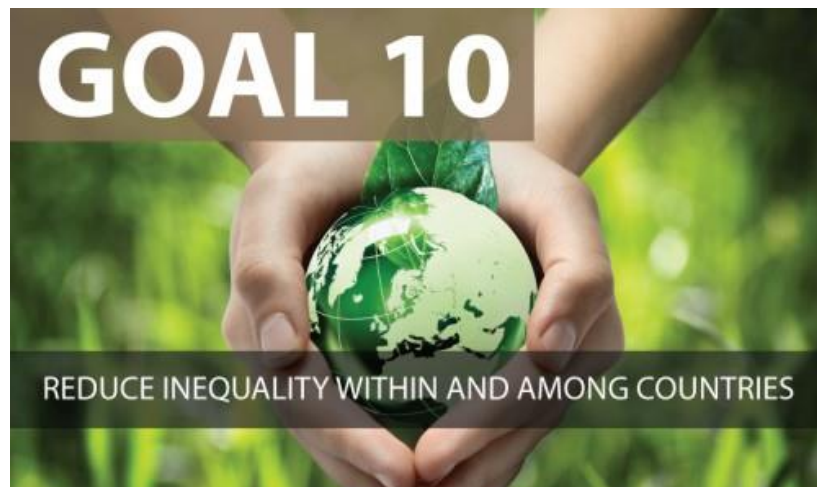


<http://www.euro-healthy.eu/>

Cíle udržitelného rozvoje

Program rozvoje na období 2015–2030

Snížit nerovnosti
uvnitř zemí i mezi nimi



- 10.3 **Zajistit rovné příležitosti a snížit nerovnosti** podporou vhodných právních předpisů, politik a postupů
- 10.4 **Přijmout politická opatření**, zejména v oblasti sociální ochrany a postupně dosáhnout větší rovnosti

- Vytvořit pro obyvatele
- příznivé prostředí měst a



- 11.6 Do roku 2030 snížit nepříznivý dopad životního prostředí měst na jejich obyvatele
- 11.7 Do roku 2030 zajistit **všeobecný přístup k bezpečné, inkluzivní a přístupné městské zeleni a veřejnému prostoru**

POPULATION HEALTH INDEX - SETTING



European Union

28 European countries

269 Regions

10 Metropolitan areas

2 Cities case studies





Geographical Inequalities - Methodology

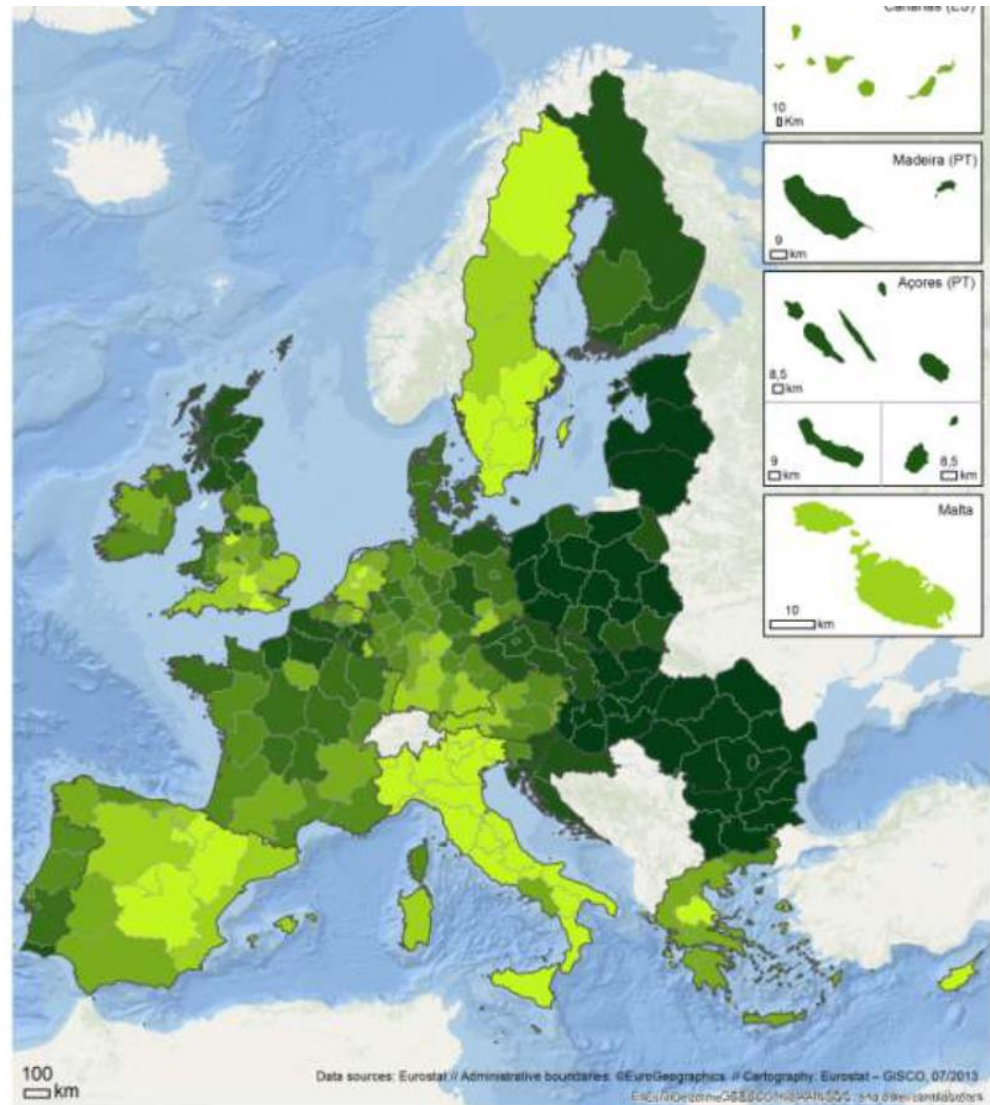
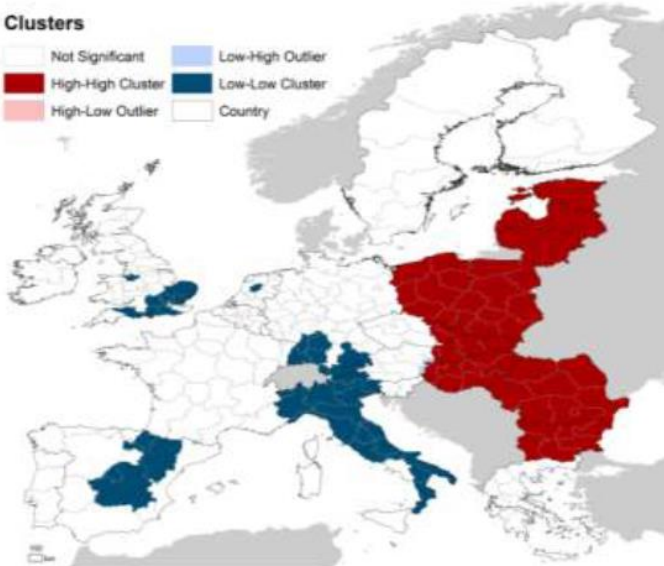
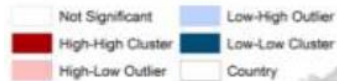
Cluster Analysis

1. Identification of indicators where all EU countries have data at regional level
(n=35)
 1. Excluded due to lack of data: Denmark, Croatia, Cyprus, Madeira and Azores (Portugal)
2. Measurement of spatial autocorrelation through Moran's I
3. Identification of clusters with the application of LISA (Local indicators of spatial association)
4. Identification of the direction of the indicator
 1. **+** Cluster high-high = contribute to better population health
 2. **-** Cluster high-high = contribute to worst population health
5. Sum of the clusters according to the direction of the indicators

Premature Mortality – SDR per 100.000 inhabitants

- Area of concern: Health Outcomes
- Dimension: Length of Life
- Reference Year: 2008-2010
- Direction: █

Clusters



Premature mortality - SDR per 100.000 inhabitants - 2008/2010



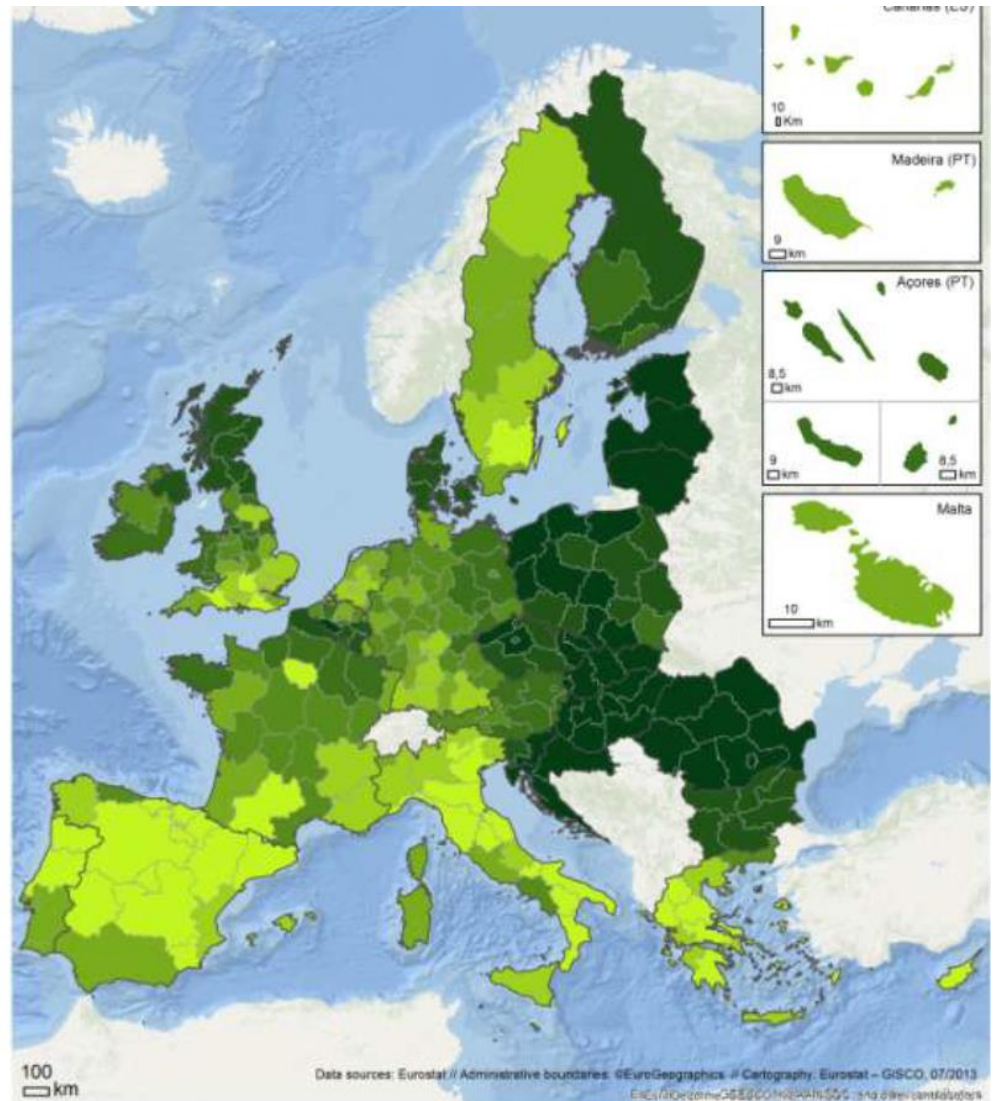
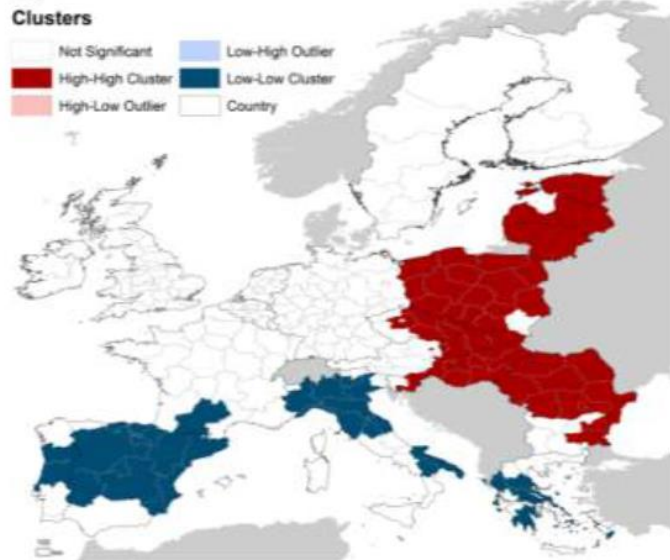
109.3 163.7 175.8 192.9 212.8 237.7 344.5 508.1

Classification Method: Quantile

NUTS 2 EU 28

Preventable Deaths – SDR per 100.000 inhabitants

- Area of concern: Health Outcomes
- Dimension: Length of Life
- Reference Year: 2008-2010
- Direction: █




Preventable deaths - SDR per 100.000 inhabitants - 2008/2010



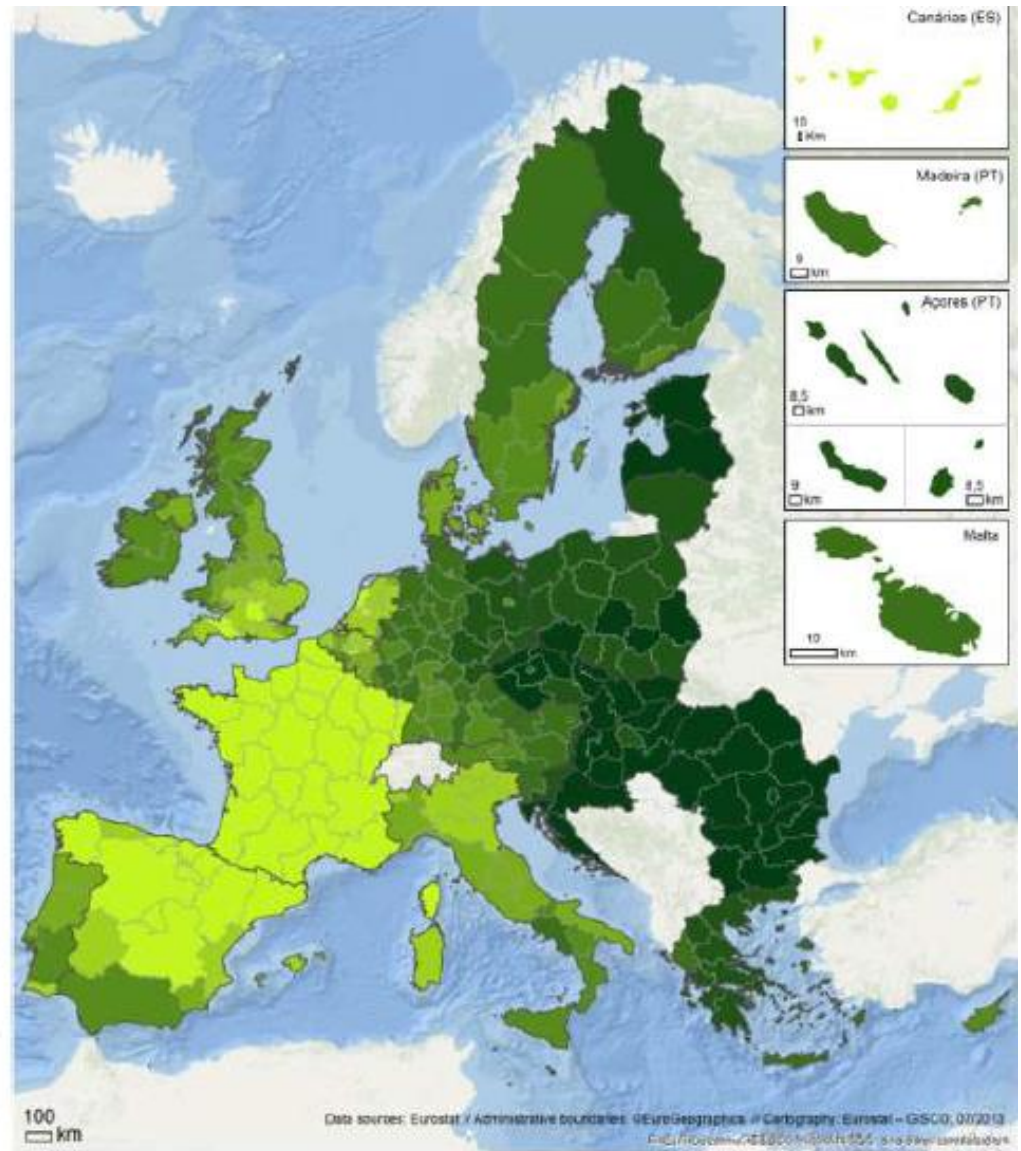
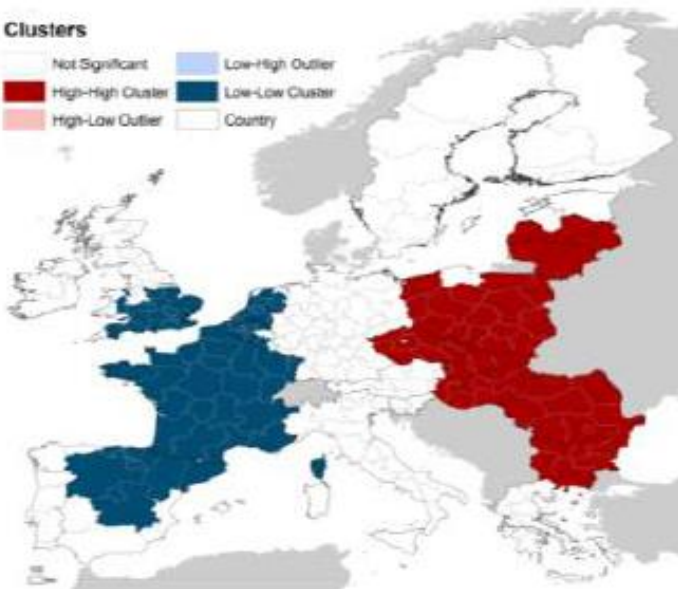
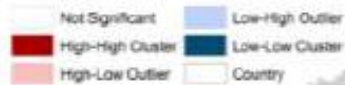
Classification Method: Quantile

NUTS 2 EU 28

Deaths from diseases of the circulatory system – SDR per 100.000 inhabitants

- Area of concern: Health Outcomes
- Dimension: Length of Life
- Reference Year: 2008-2010
- Direction: 

Clusters



Deaths from diseases of the circulatory system - SDR per 100.000 inhabitants - 2008/2010



Classification Method: Quantile

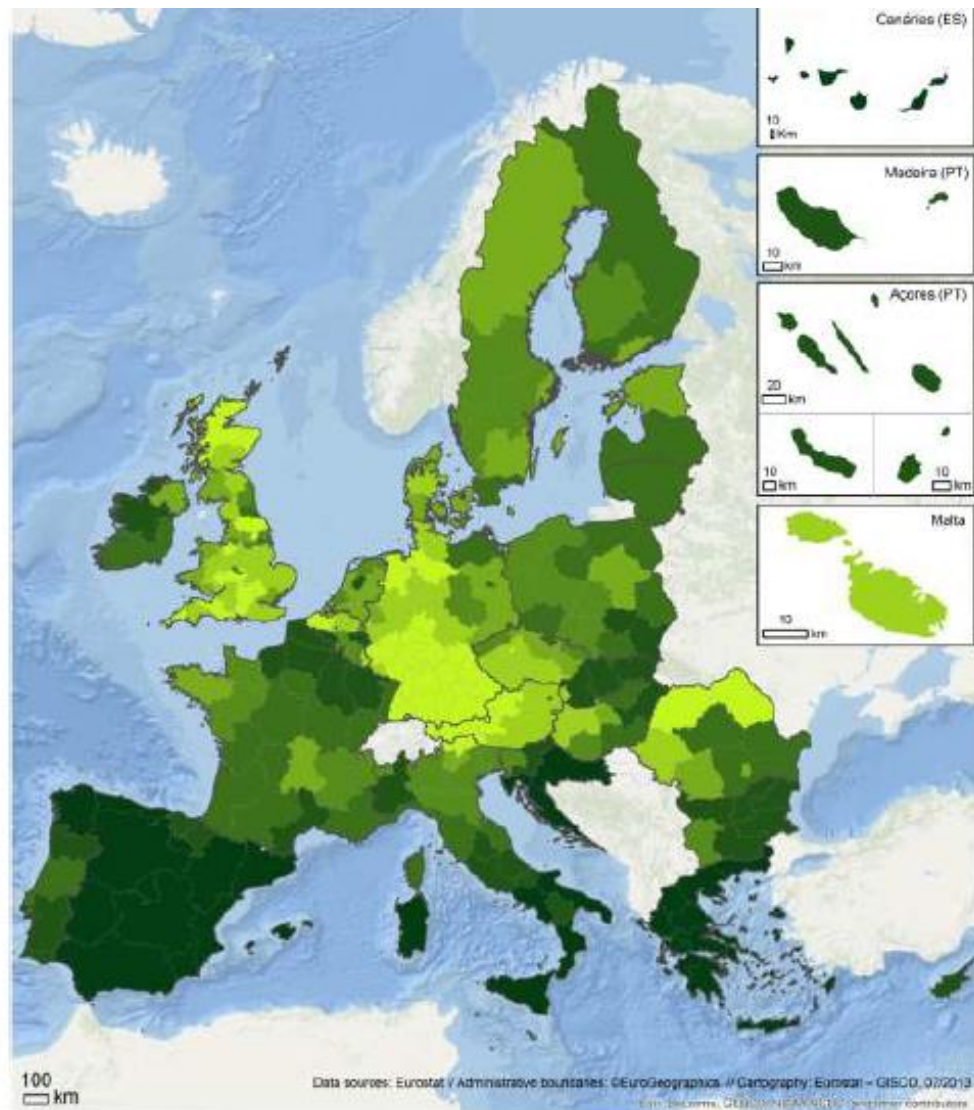
NUTS 2 EU 28

■ Unemployment Rate (%)

- Area of concern: economic and social
- Dimension: Employment
- Reference Year: 2014
- Direction: ■

Clusters

 Not Significant	 Low-High Outlier
 High-High Cluster	 Low-Low Cluster
 High-Low Outlier	 Country



Unemployment rate (%) - 2014



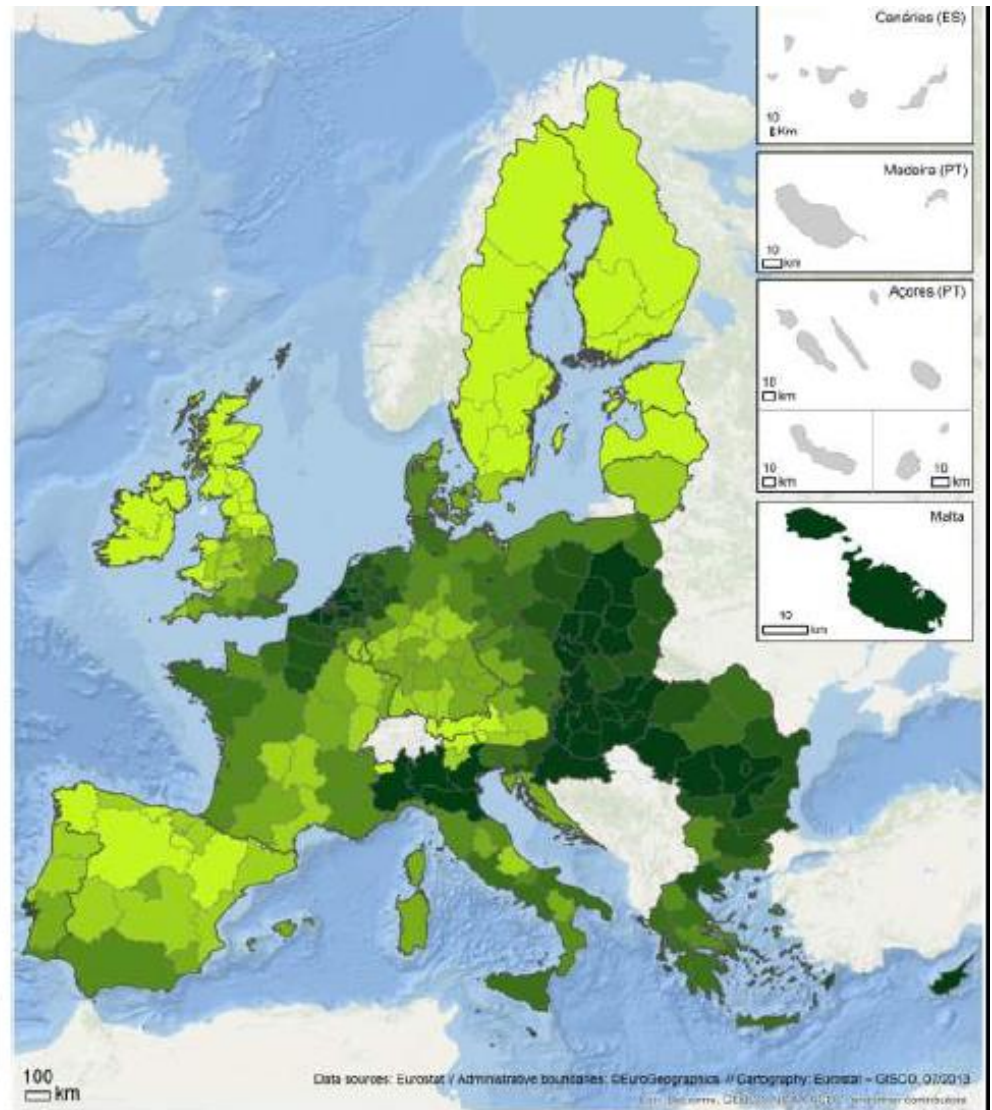
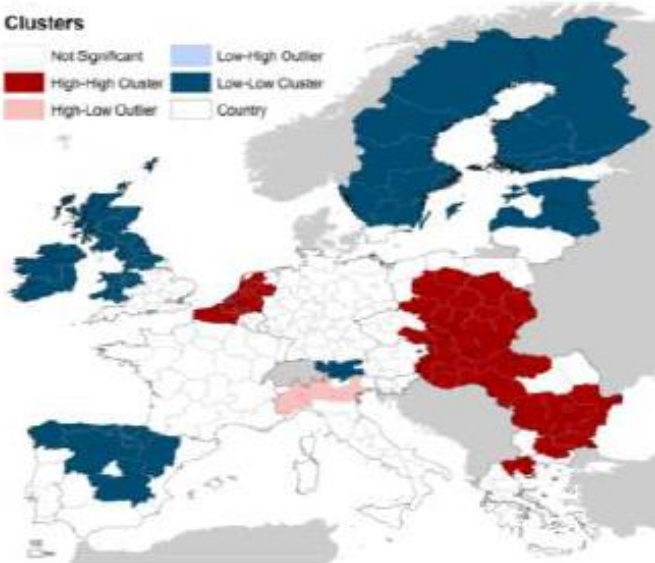
Classification Method: Quantile

NUTS 2 EU 28

Annual mean of the daily PM10 concentrations (ug/m³)

- Area of concern: Physical Environment
- Dimension: Pollution
- Reference Year: 2012
- Direction: ■

Clusters



Annual mean of the daily PM10 concentrations (ug/m³) - 2011



Classification Method: Quantile

Study 1

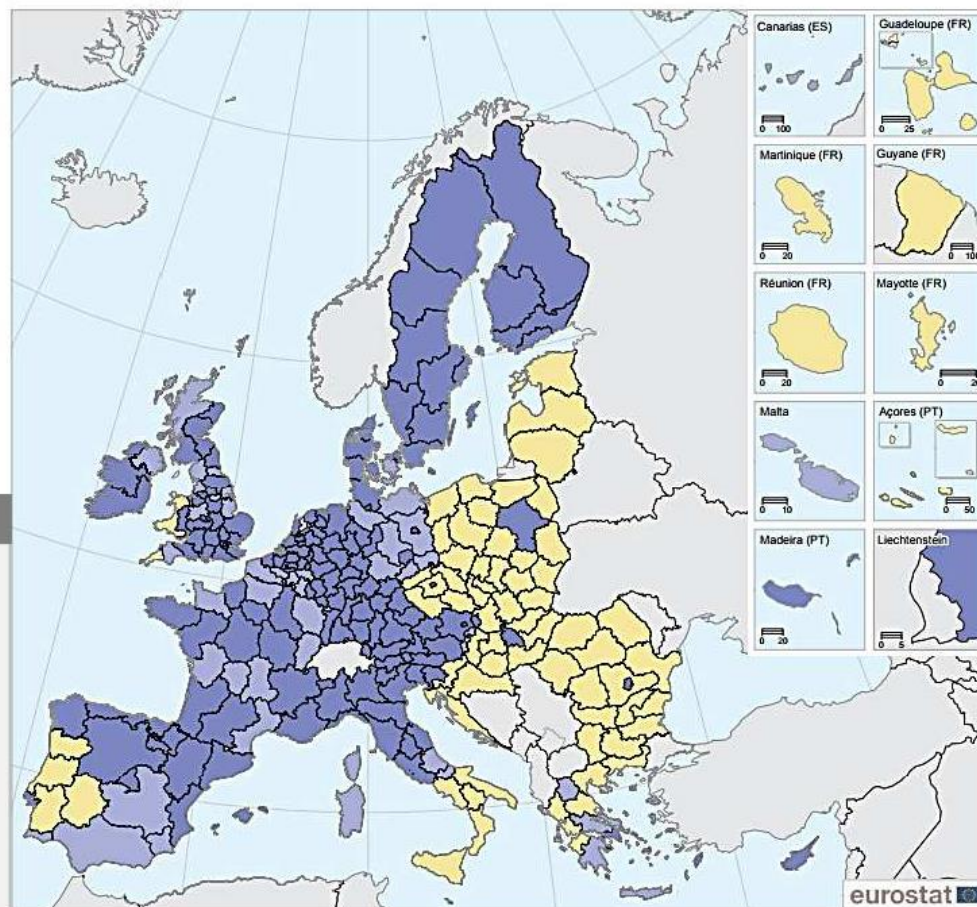
Population health indicators and regional eligibility for receiving EU funds

STRUCTURAL FUNDS

EU instruments used to reduce the significant gap between less-favoured regions and more developed ones contributing, directly and indirectly, to achieve health equity

The amount of funding is allocated to regions according to their GDP per capita

Map 1.1: Regional eligibility for structural funds, by NUTS level 2 region, 2014–20 (¹)
(% of EU-27 average)



(% of EU-27 average)

- Less developed regions (GDP per inhabitant, < 75)
- Transition regions (GDP per inhabitant, ≥ 75 – < 90)
- More developed regions (GDP per inhabitant, ≥ 90)

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 06/2015



Data

Indicators of 10 areas of concern:

- Economic conditions, social protection and security
- Education
- Demographic change
- Lifestyles and health behaviours
- Physical environment
- Built environment
- Road safety
- Healthcare resources and expenditure
- Healthcare performance
- Health outcomes

Study setting

269 regions (NUTS 2); 28 EU countries

Statistical analysis

- To identify indicators of the largest inequalities across European regions
 - **Gini coefficient**
- To detect whether there are statistical differences in the indicators' means between the 3 groups of regional eligibility for receiving SF
 - **Analysis of variance ANOVA (one-way)**

Tukey's test

Null hypothesis: there are no differences

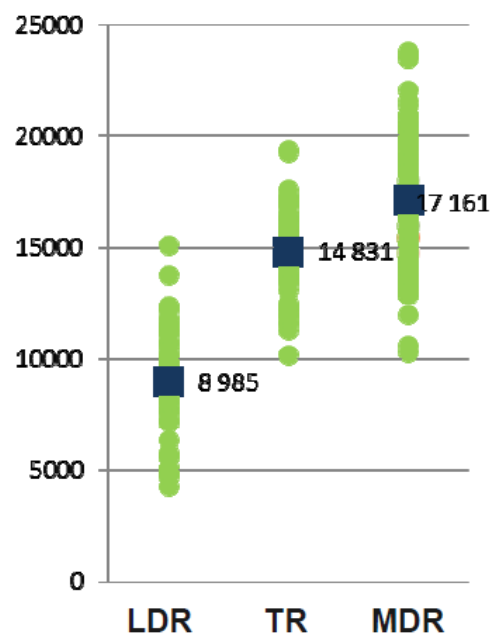
A significance level of 95% (P values less than 0.05) was used to identify whether or not the difference between the groups averages most likely reflects a "real" difference



Statistical differences in the indicators' means

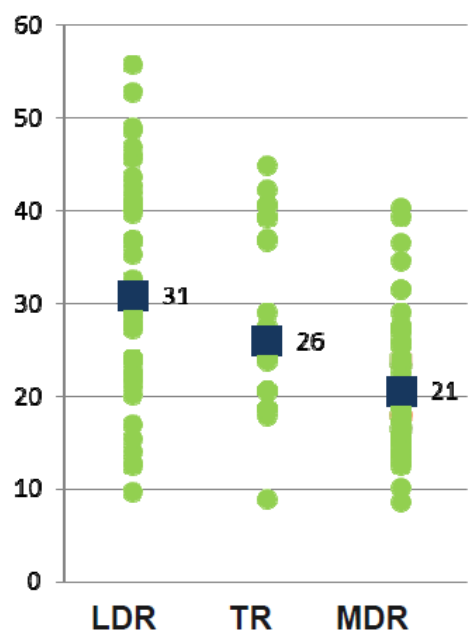
Income and Living conditions

Disposable income of private households per capita (€)



GINI 0,15 0,08 0,07
(0.13)

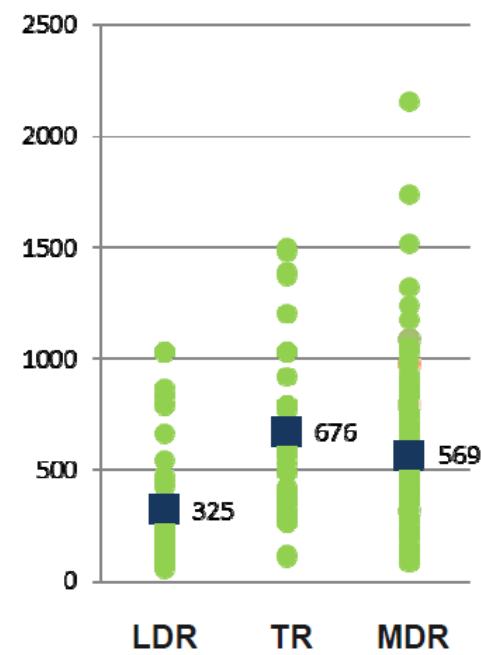
People at risk of poverty or social exclusion (%)



GINI 0,18 0,17 0,13
(0.21)

Security

Crimes recorded by the police (per 100 000 inhabitants)



GINI 0,43 0,29 0,38
(0.41)

● NUTS2' value ■ Mean value of the group of eligibility regions

Statistical differences in the indicators' means

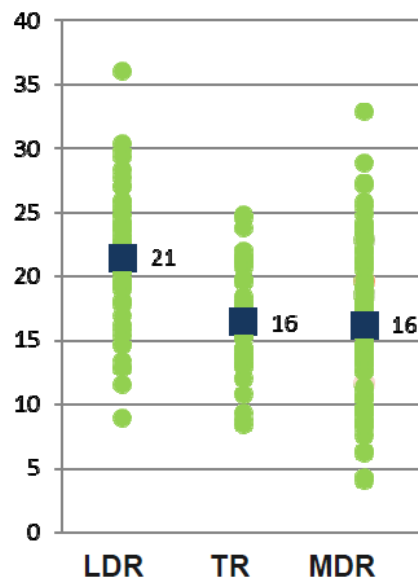
Pollution

Annual mean of the daily PM2.5 concentrations (ug/m3)



GINI 0,15 0,13 0,20
(0.18)

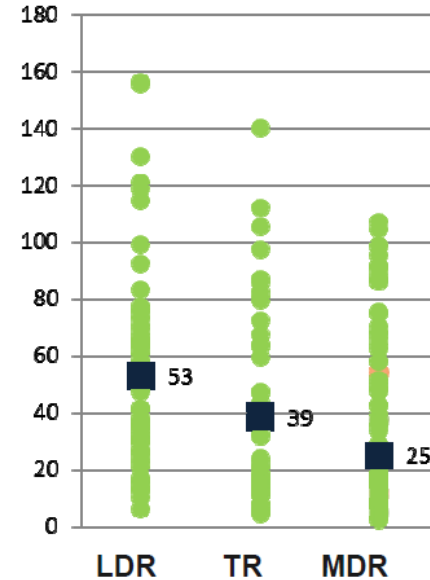
Annual mean of the daily PM10 concentrations (ug/m3)



GINI 0,12 0,13 0,19
(0.16)

Road Safety

Fatality rate due to road traffic accidents (per 1.000 victims)

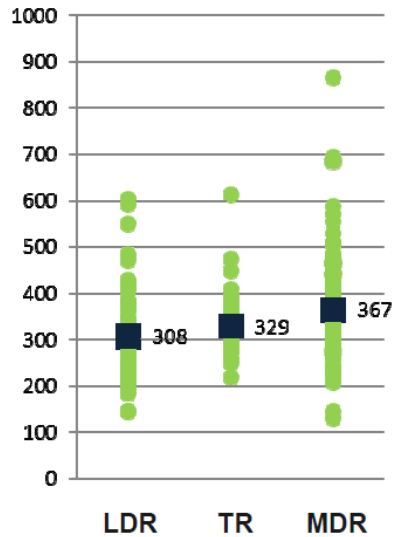


GINI 0,34 0,46 0,41
(0.41)

Statistical differences in the indicators' means

Healthcare Resources

Medical Doctors
per 100 000 inhabitants



GINI (0.15) 0,17 0,10 0,16

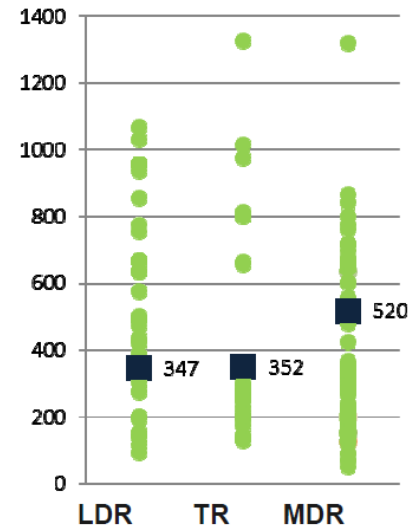
Health personnel
per 100 000 inhabitants



GINI (0.20) 0,10 0,19 0,14

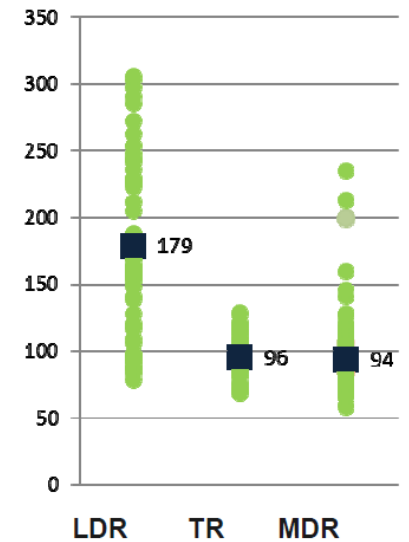
Healthcare Performance

Avoidable hospital discharges
(per 100 000 inhabitants)



GINI (0.31) 0,26 0,33 0,23

Amenable deaths due to
healthcare (SDR per 100 000 inhabitants)



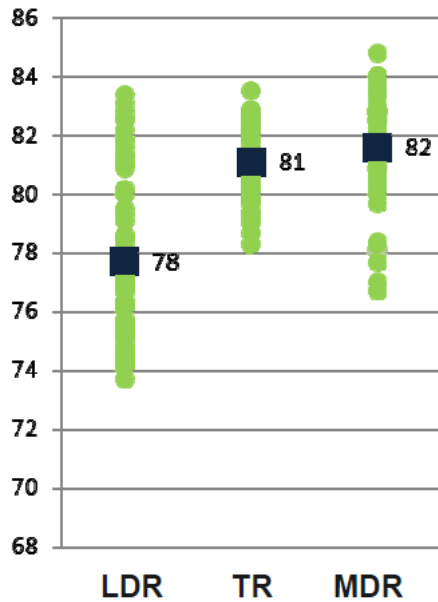
GINI (0.25) 0,20 0,10 0,11

● NUTS2' value ■ Mean value of the group of eligibility regions

Statistical differences in the indicators' means

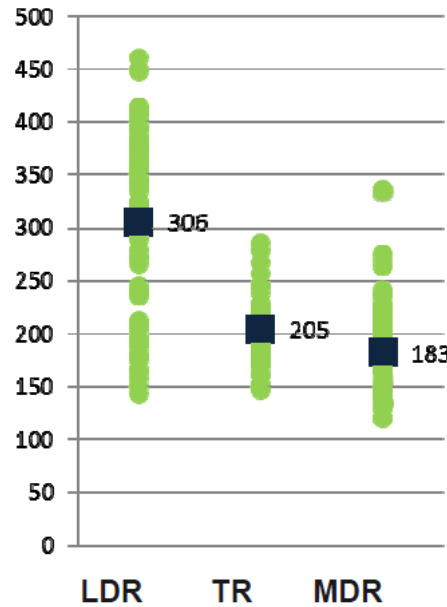
Mortality

Life expectancy at birth (years)



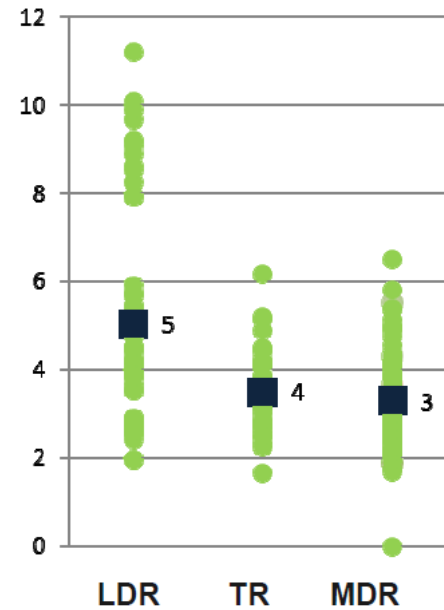
GINI 0,02 (0.02) 0,01 0,01

Premature mortality (SDR per 100 000 inhabitants)



GINI 0,16 (0.18) 0,09 0,07

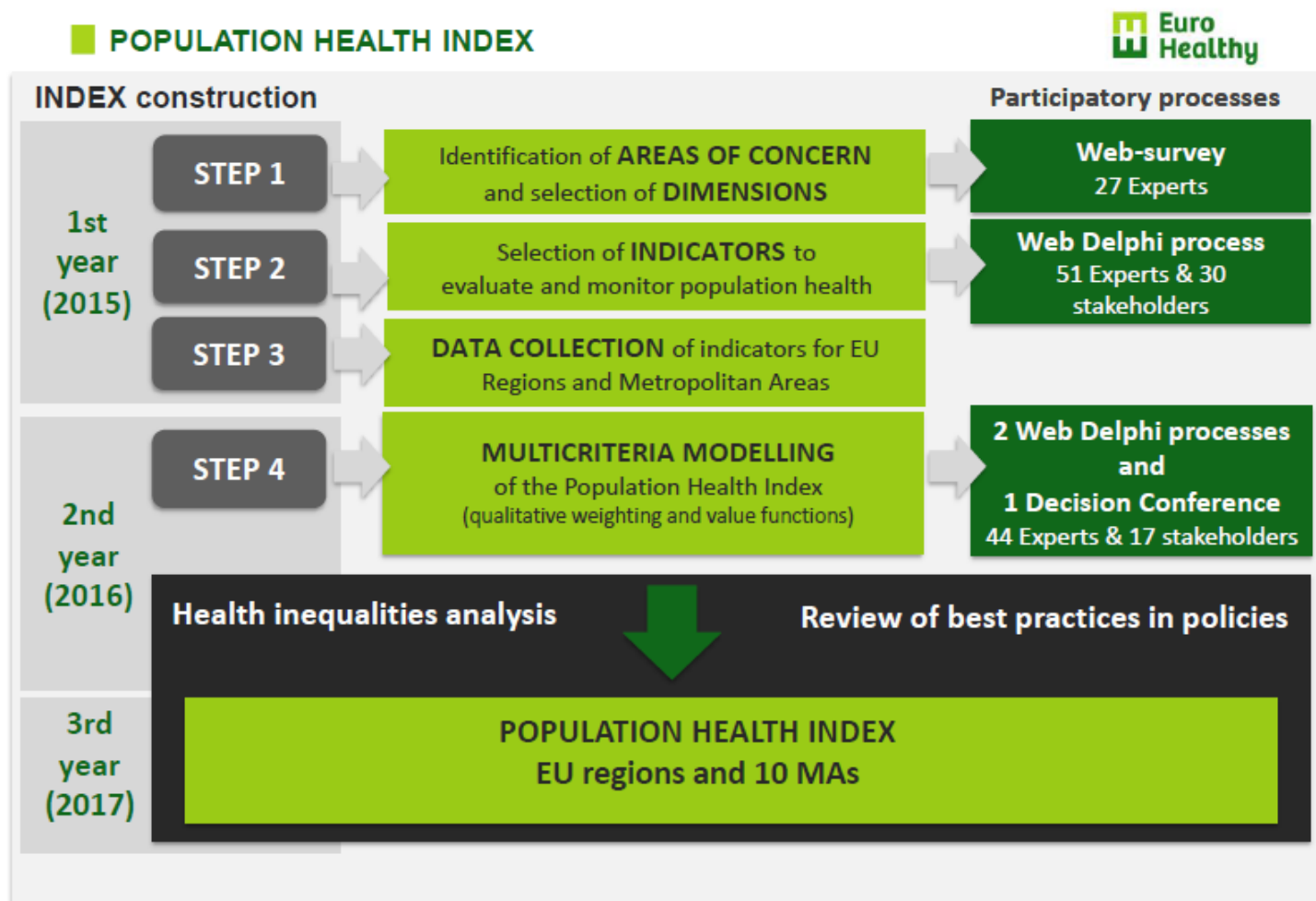
Infant mortality (per 1 000 live births)



GINI 0,24 (0.22) 0,13 0,14

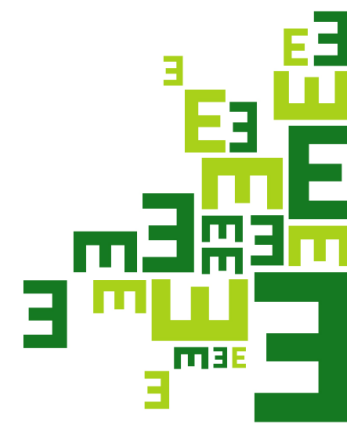
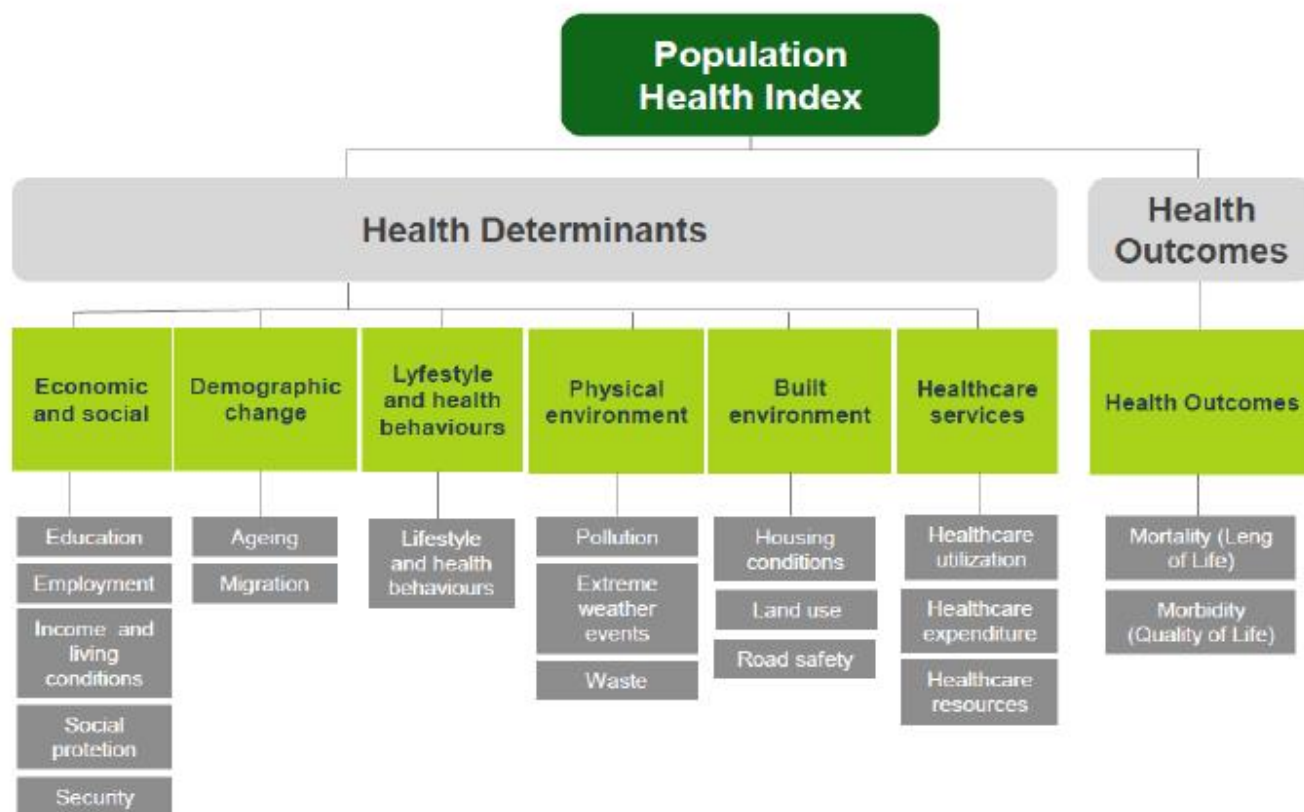
● NUTS2' value ■ Mean value of the group of eligibility regions

Health Outcome – Health Index



Health Outcome – Health Index

Population Health Index: final list of indicators



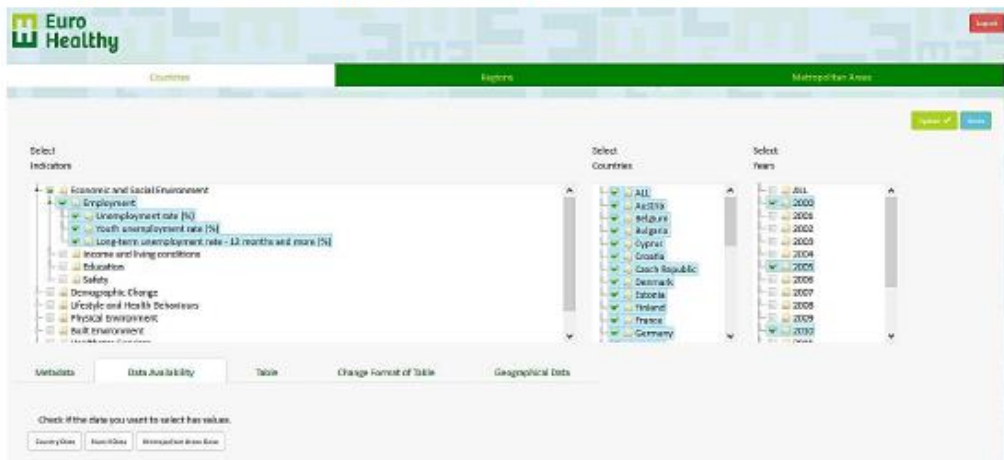
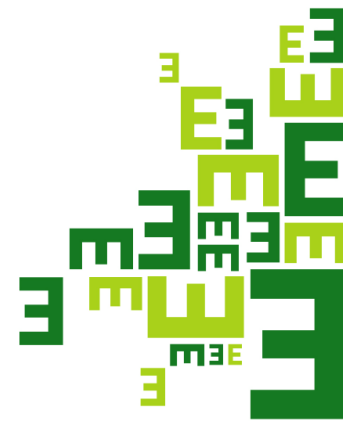


Table 1.1. Number of NUTS 2 level regions by country

(AT)	Austria	09	(FI)	Finland	05	(NL)	Netherlands	12
(BE)	Belgium	11	(FR)	France	22	(PL)	Poland	16
(BG)	Bulgaria	06	(HR)	Croatia	02	(PT)	Portugal	07
(CY)	Cyprus	01	(HU)	Hungary	07	(RO)	Romania	08
(CZ)	Czechia	08	(IE)	Ireland	02	(SE)	Sweden	08
(DE)	Germany	38	(IT)	Italy	21	(SI)	Slovenia	02
(DK)	Denmark	05	(LT)	Lithuania	01	(SK)	Slovakia	04
(EE)	Estonia	01	(LU)	Luxemburg	01	(UK)	United Kingdom	40
(EL)	Greece	13	(LV)	Latvia	01	TOTAL		
(ES)	Spain	17	(MT)	Malta	01			269

- Enables **data sharing** (upload, storage and download)
- Facilitates the **integration of a large set of indicators** from different dimensions in the different scales of analysis (country, NUTS2 and municipalities)
- Allows **database integrity** easing the comparison and aggregation of the indicators



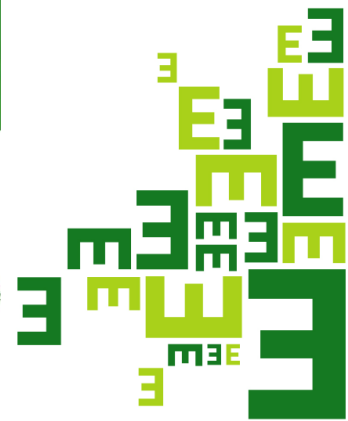


Web-Delphi

THIS INDICATOR IS RELEVANT TO THE EVALUATION OF THE EUROPE'S POPULATION HEALTH

INDICATOR	STRONGLY DISAGREE	DISAGREE	NEITHER AGREE NOR DISAGREE	AGREE	STRONGLY AGREE
Adults who are obese (aged 20 and over)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Regular daily smokers in the population (aged 15 and over)	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Daily smokers (aged 15 and over)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Number of cigarettes smoked per day, smokers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Pure alcohol consumption - litres per capita (aged 15 and over)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Population engaged in vigorous or moderate physical activity on 2 or more days a week	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Average amount of fruits and vegetables available per person per year	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Average number of calories available per person per day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Protein available per person per day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Live births by mothers under age of 20	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

- Added **diversity of points of view** in the structuring and modelling of the PHI
- Improved the **collaboration research** amongst all partners



Web Delphi Process

Socio-economic panel



Final group majority judgment on each indicator, and distribution of the participants' final judgments (round 3)

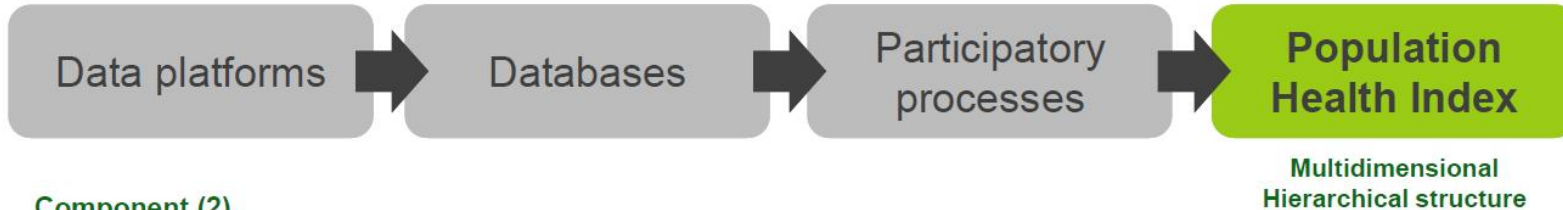


15 participants

Dimension	Indicator	GAP		Group majority judgment about closing the gap	Not important	Very weakly important	Weakly important	Moderately important	Strongly important	Very strongly important	Extremely important	Don't know/Don't want to answer
		From	To									
Employment	Unemployment rate (%)	34.8	2.5	Extremely important				1 (7%)	3 (20%)	2 (13%)	9 (60%)	
	Long-term unemployment rate - 12 months and more (%)	22.1	0.8	Extremely important					2 (13%)	2 (13%)	11 (73%)	
Income & living conditions	Disposable income of private households per capita (Euro per inhabitant)	4300	23800	Strongly important			1 (7%)	10 (67%)	3 (20%)	1 (7%)		
	People at risk of poverty or social exclusion (%)	55.8	8.6	Extremely important					1 (7%)	1 (7%)	13 (87%)	
	Disposable income ratio - S80/S20 (ratio)	7.2	3.5	Very strongly important					3 (20%)	10 (67%)	2 (13%)	
Social protection	Expenditure on care for elderly (% of GDP)	0.0	2.3	Strongly important		1 (7%)	4 (27%)	9 (60%)	1 (7%)			
Education	Population aged 25-64 with upper secondary or tertiary education attainment (%)	26.7	97.3	No majority found		1 (7%)	2 (13%)	4 (27%)	7 (47%)	1 (7%)		
	Early leavers from education and training (%)	32.8	2.2	No majority found			1 (7%)	6 (40%)	6 (40%)	2 (13%)		
Security	Crimes recorded by the police per 100.000 inhabitants	1741.4	60.5	Moderately important		4 (27%)	8 (53%)	3 (20%)				
Quality of Life (Morbidity)	Self-perceived health less than good (%)	54.7	17.7	No majority found		2 (13%)	1 (7%)	4 (27%)	6 (40%)	2 (13%)		



WP5: MAIN RESULTS



Component (2)

> DETERMINANTS

> OUTCOMES

Areas of concern (10)

✓ DETERMINANTS

> Economic conditions, social protection and security

> Education

> Demographic change

> Lifestyles and health behaviours

> Physical environment

> Built environment

> Road Safety

> Healthcare resources and expenditure

> Healthcare performance

✓ OUTCOMES

> Health outcomes

Dimensions (17)

✓ Economic conditions, social protection and security

> Employment

> Income and living conditions

> Social protection

> Security

(...)

Indicators (39)

✓ Income and living conditions

> Disposable income of private households per capita

> People at risk of poverty or social exclusion

> Disposable income ratio - S80/S20

(...)

- **Several sub-indices** where population health across NUTS 2 and MAs is measured



SUMMARY ANALYSIS OF THE HEALTH DETERMINANTS COMPONENT

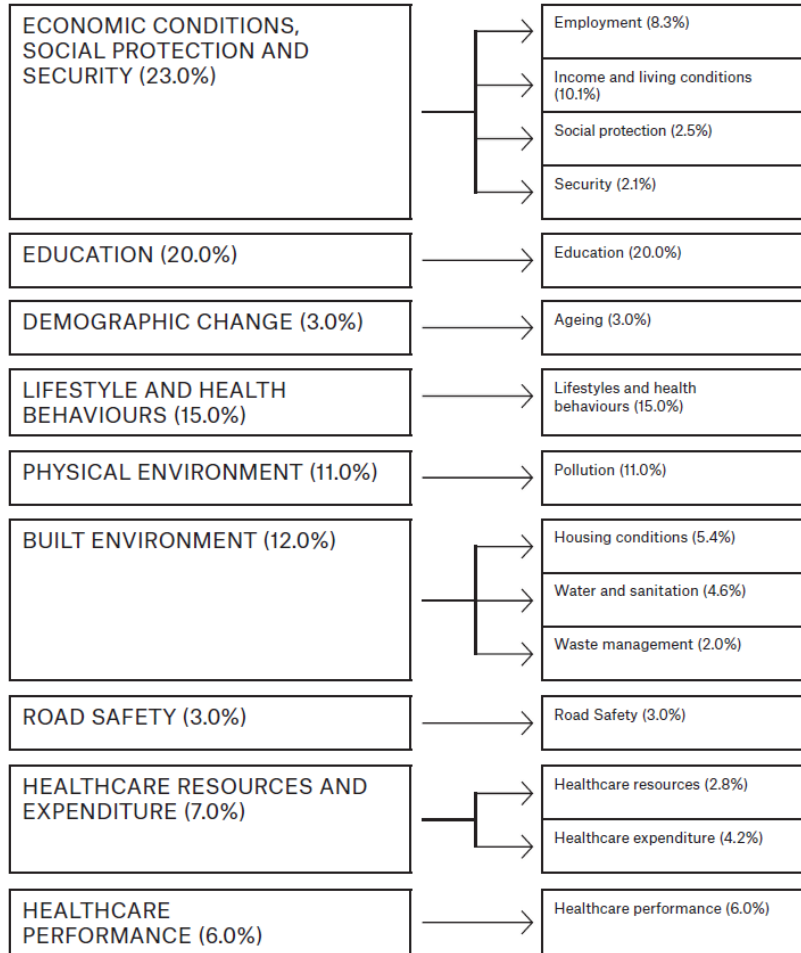


Figure 2.1. Structure of PHI Health Determinants component.

SUMMARY ANALYSIS OF THE HEALTH OUTCOMES COMPONENTS

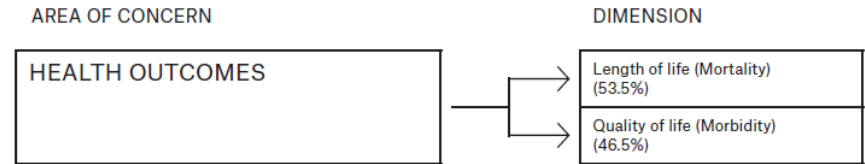
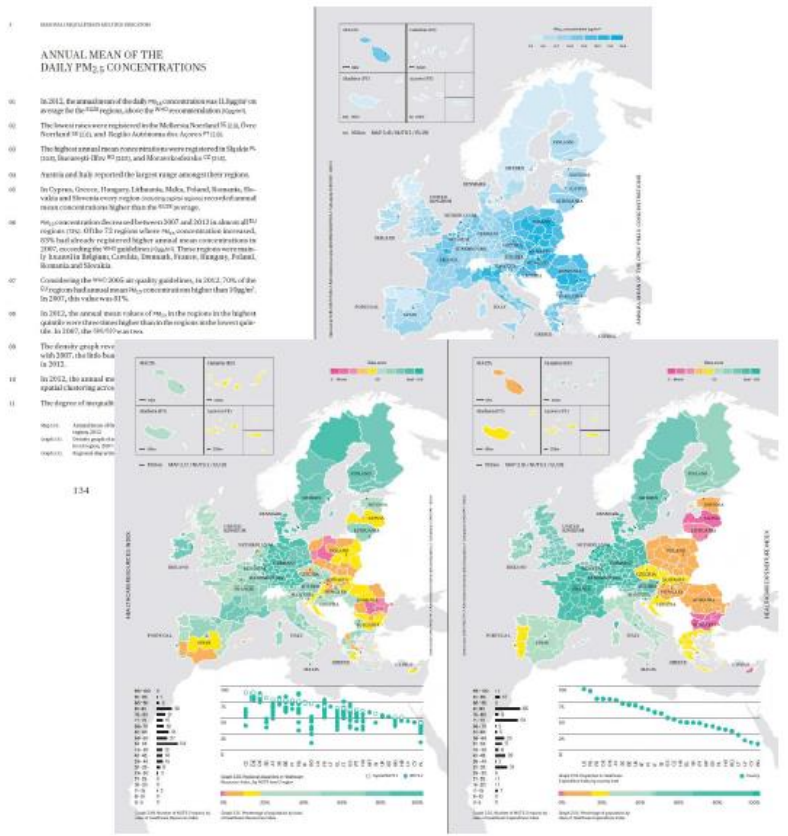


Figure 2.2. Structure of PHI Health Outcomes component

(%) Coefficient weights. Health Outcomes = 100%

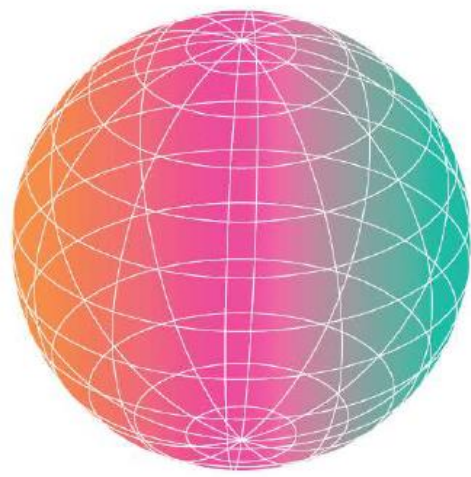
Health Outcome – Health Index

WP5: Population Health Index



- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czechia
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithuania
- Luxemburg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- United Kingdom

Atlas of Population Health in European Union Regions



The EURO-HEALTHY project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 643398.

Health Determinants Index

Index determinant zdraví

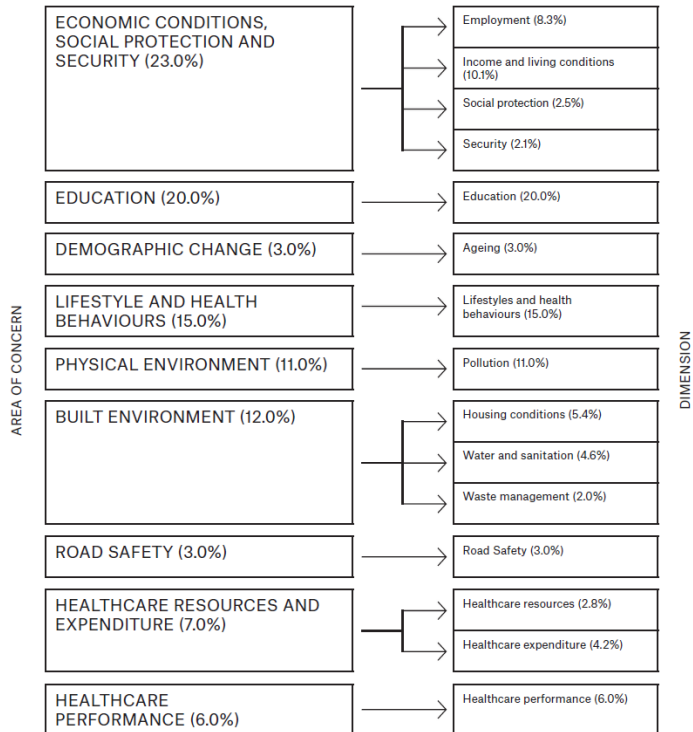
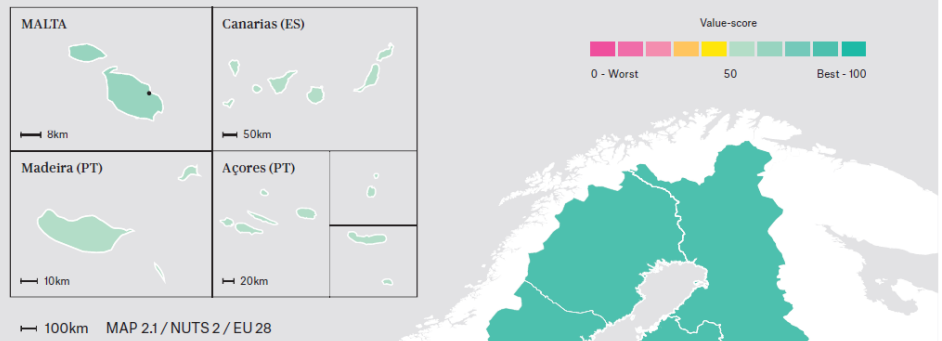
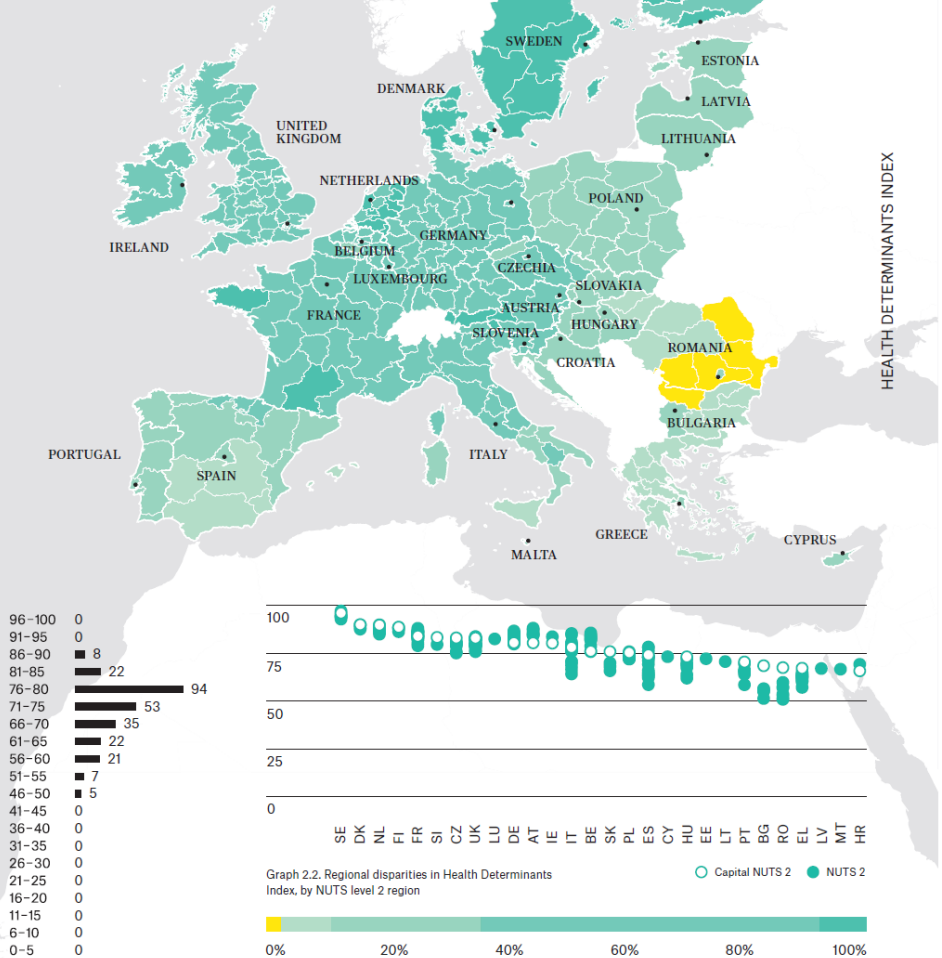


Figure 2.1. Structure of PHI Health Determinants component.

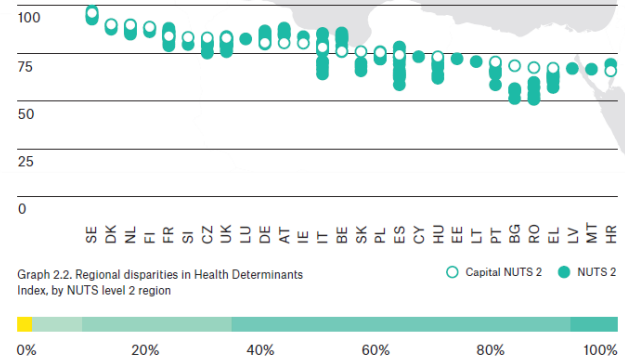
(%) Coefficient weights. Health Determinants = 100%



Data source: EURO-HEALTH // Administrative boundaries // Cartography: EUROSTAT - GBCO



Graph 2.1. Number of NUTS 2 regions by class of Health Determinants Index



Graph 2.2. Regional disparities in Health Determinants Index, by NUTS level 2 region

Graph 2.3. Percentage of population by class of Health Determinants Index

Health outcomes index

Index zdravotního stavu

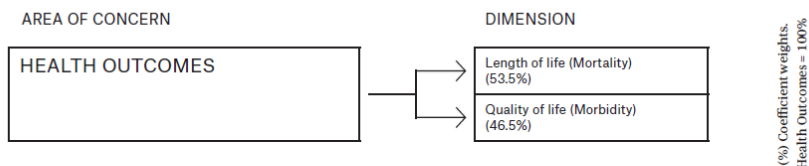


Figure 2.2. Structure of PHI Health Outcomes component

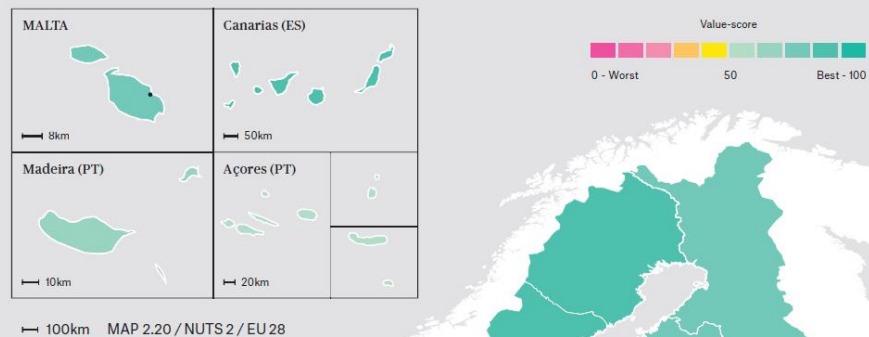
This area of concern includes two dimensions and six indicators:

LENGTH OF LIFE (MORTALITY)

- 3.10.1. Life expectancy at birth (years)
- 3.10.2. Infant mortality, per 1 000 live births
- 3.10.3. Preventable deaths (standardised death rate per 100 000 inhabitants)

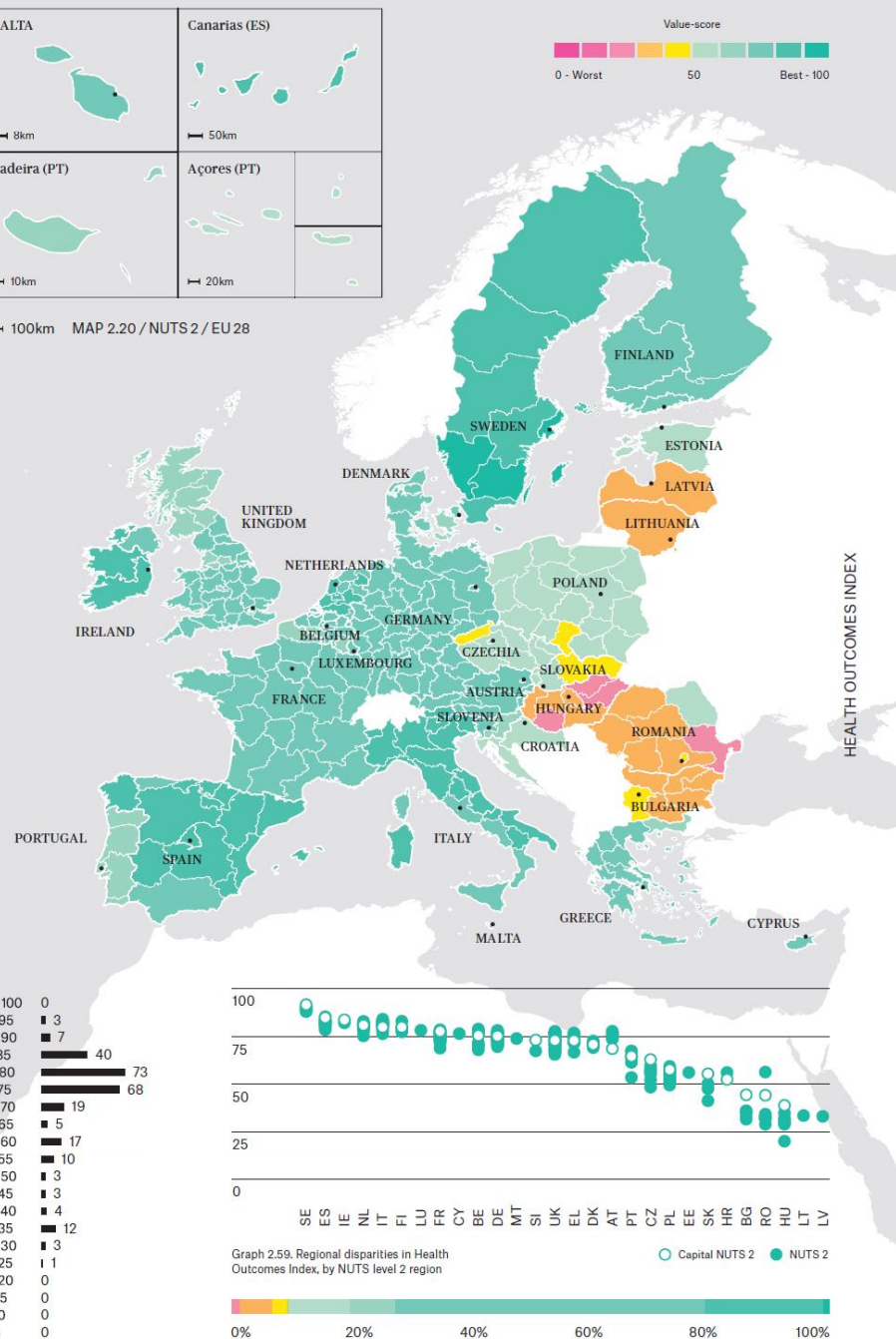
QUALITY OF LIFE (MORBIDITY)

- 3.10.4. Self-perceived health less than good (%)
- 3.10.5. Age-standardized Disability-Adjusted Life Year (DALY) rates (per 100 000 inhabitants)
- 3.10.6. Low birth weight (%)



MAP 2.20 / NUTS 2 / EU 28

Data sources: EURO-HEALTHY // Administrative boundaries: @EuroGeographics // Cartography: EUROSTAT - @BICO



Graph 2.58. Number of NUTS 2 regions by class of Health Outcomes Index

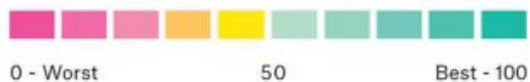
Graph 2.60. Percentage of population by class of Health Outcomes Index

NUTS 2 HEALTH OUTCOMES index

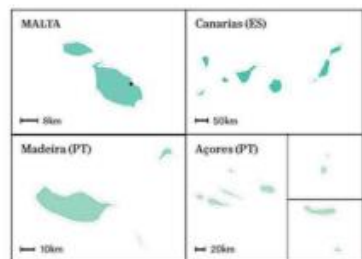
Indicators:

- Preventable deaths
- Infant mortality
- Life expectancy at birth

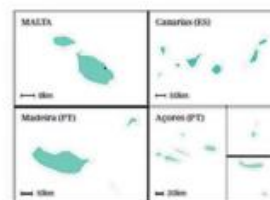
Value-score



Dimension NUTS 2 MORTALITY index



100km MAP 2.20 / NUTS 2 / EU 28



100km MAP 2.21 / NUTS 2 / EU 28

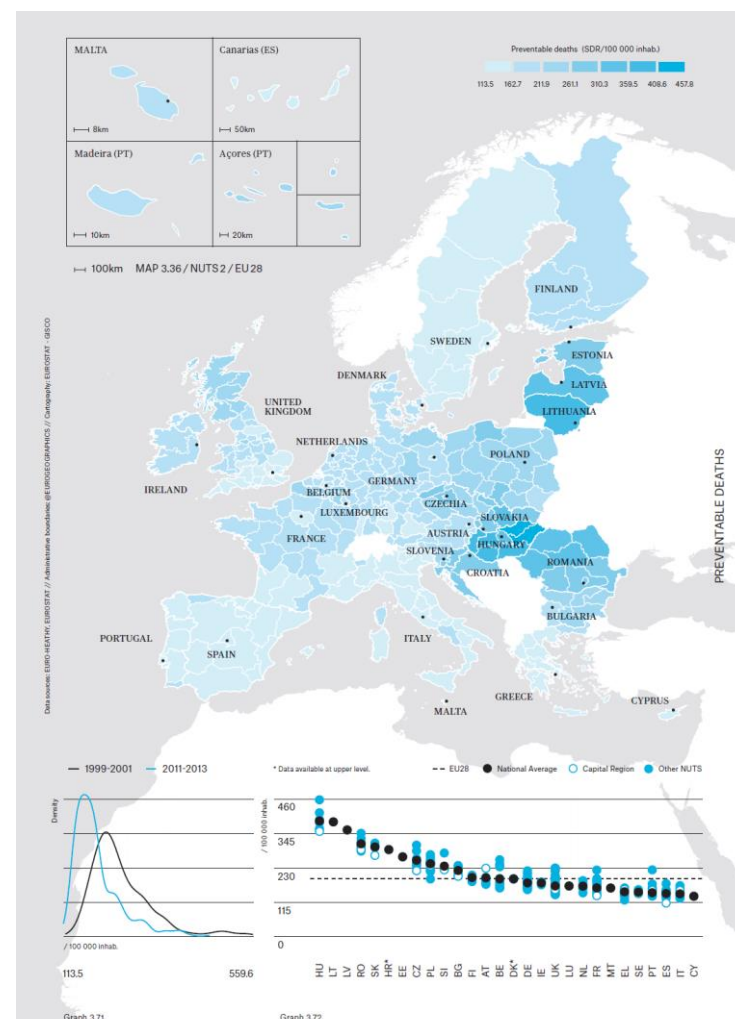


Indicator: Preventable Deaths

Preventable mortality (odvratitelná životním stylem, podporou zdraví např. rakovinu plic lze eliminovat nekuřáctvím)

PREVENTABLE DEATHS

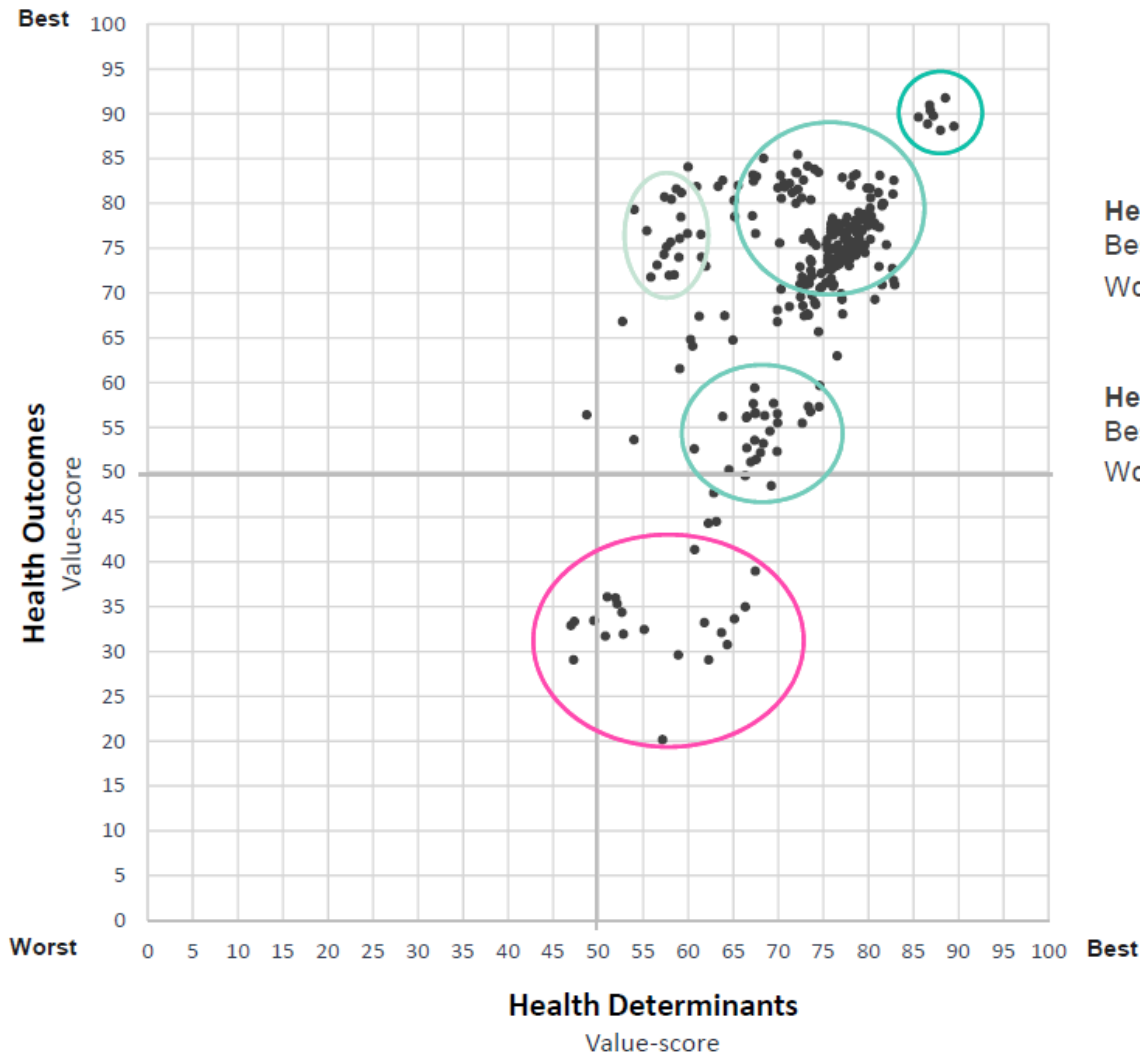
- 01 In 2011-2013, on average there were 194 deaths from preventable causes per 100 000 inhabitants in the EU28 regions.
- 02 The lowest values were registered in Comunidad de Madrid ^{ES} [113.5], Voreio Aigaiο ^{EL} [123.4], and Marche ^{IT} [129.7].
- 03 The highest values were registered in Hungary: Eszak-Magyarország [457.8], Észak-Alföld [444.7], and Dél-Alföld [391.2].
- 04 Hungary, France, Belgium, Czechia and Portugal reported the largest increase among their regions.
- 05 In Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia every region (including capital regions) recorded a rate higher than the EU28 average.
- 06 Preventable mortality decreased in almost all EU regions between 1999-2001 and 2011-2013 [99%], with the exception of Nord-Est, located in Romania.
- 07 In 2011-2013, the values of the regions in the highest quintile were two times higher than in the regions in the lowest quintile. In 1999-2001, the S80/S20 was the same.
- 08 The density graph reveals a right-skewed distribution in 2011-2013 (concentration on lower values). In 1999-2001, there was a higher range and a lower concentration, meaning that inequalities among the EU regions decreased.
- 09 In 2011-2013, the infant mortality rate revealed a significant spatial clustering across EU regions [MORAN's I: 0.85, $p < 0.01$].
- 10 The degree of inequality among EU regions was 0.15 in 2011-2013.



Index (PHI) – Area of concern (Health Out.)- Dimension (Mortality) - Indicator

Population Health Index Determinants and Outcomes, 269 NUTS 2

■ WP5: PHI application to the EU regions



Health Determinants

Best: 89.5 (SE: Övre Norrland)

Worst: 47.0 (RO: Sud-Muntenia)

Health Outcomes:

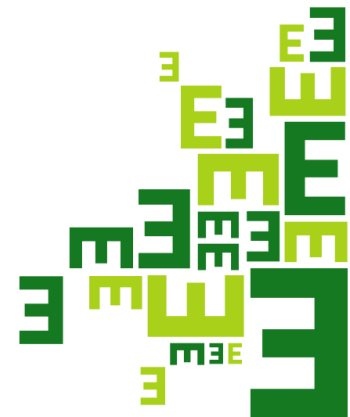
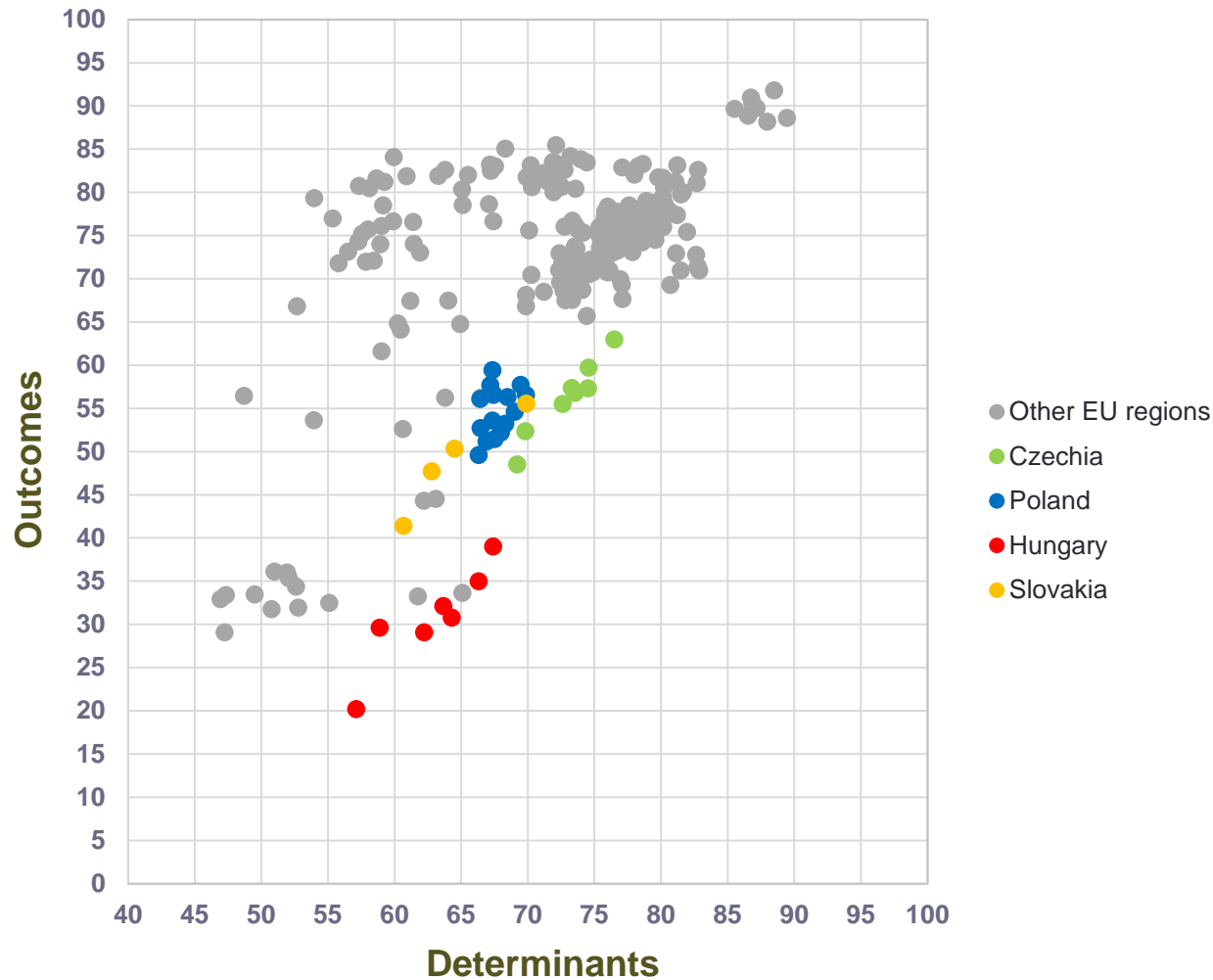
Best: 91.8 (SE: Stockholm)

Worst: 20.2 (HU: Észak-Magyarország)



Population Health Index

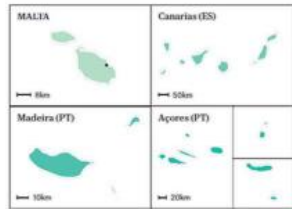
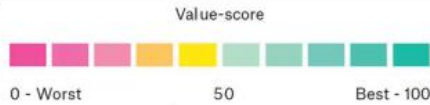
Determinants and Outcomes, 269 NUTS 2



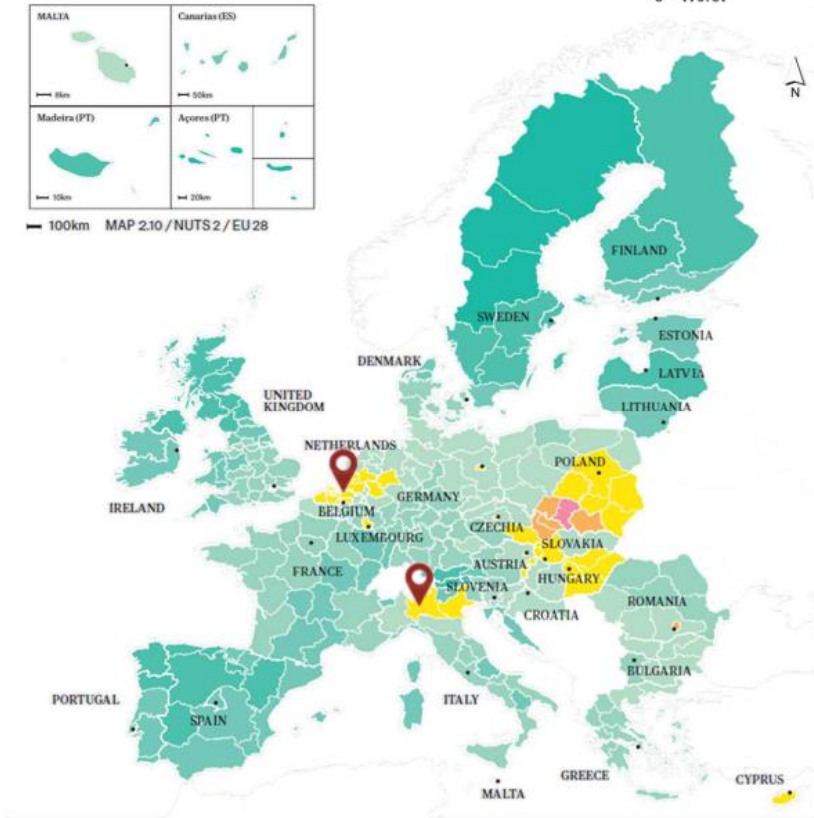
NUTS 2 PHYSICAL ENVIRONMENT index



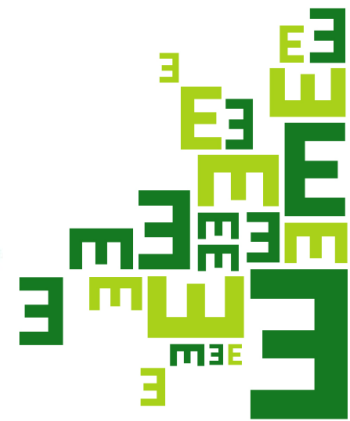
- PM2.5 concentrations
- PM10 concentrations
- Greenhouse gas emissions



100km MAP 2:10 /NUTS 2/ EU 28



METROPOLITAN AREAS examples PHYSICAL ENVIRONMENT index



Population Health Index, metropolitan areas

Populační index zdraví, metropolitní oblasti Prague

Figure 2. Disparities of the PHI value-scores within the metropolitan areas and of their respective regions (NUTS 2)

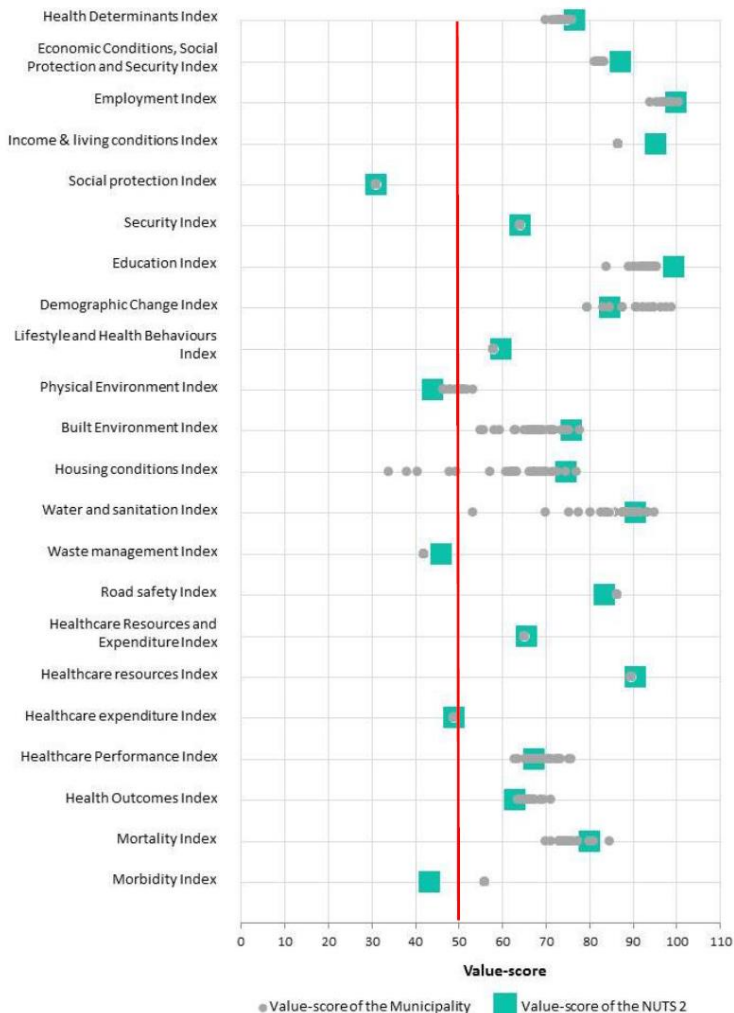


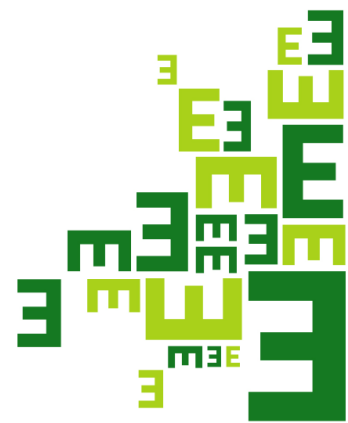
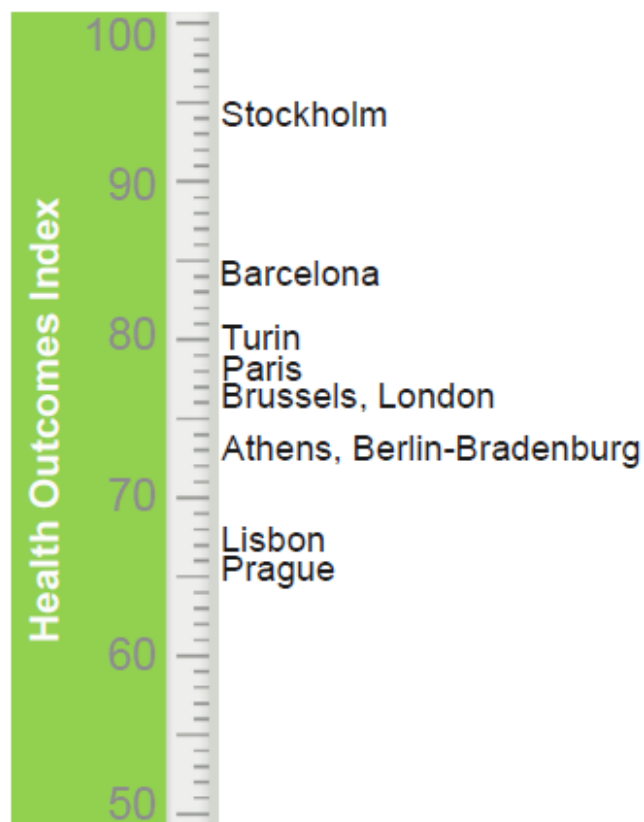
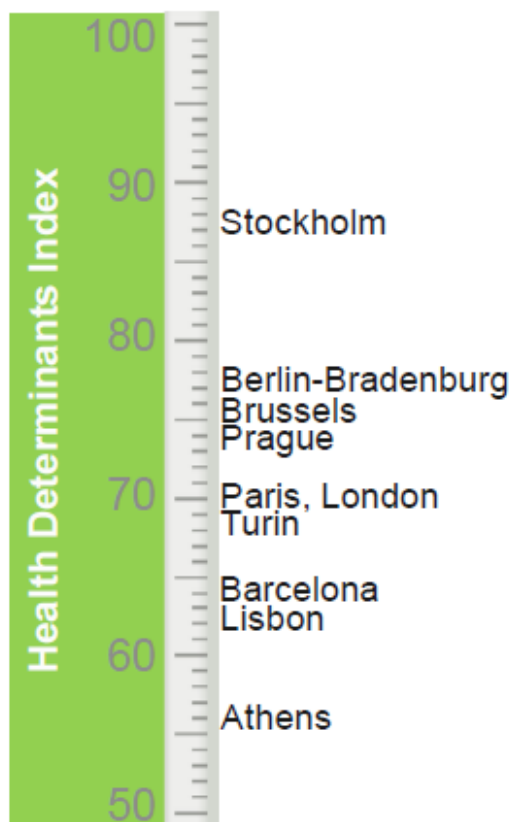
Figure 3. Percentage of population by PHI class (cumulative percentage).



■ Which Metropolitan Area performs better?



More than half of the population lives in Municipalities with a value-score equal or higher than:

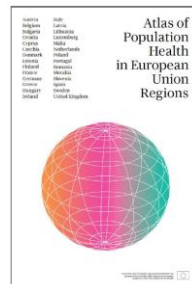


Dissemination

- Web page: <http://www.euro-healthy.eu/>

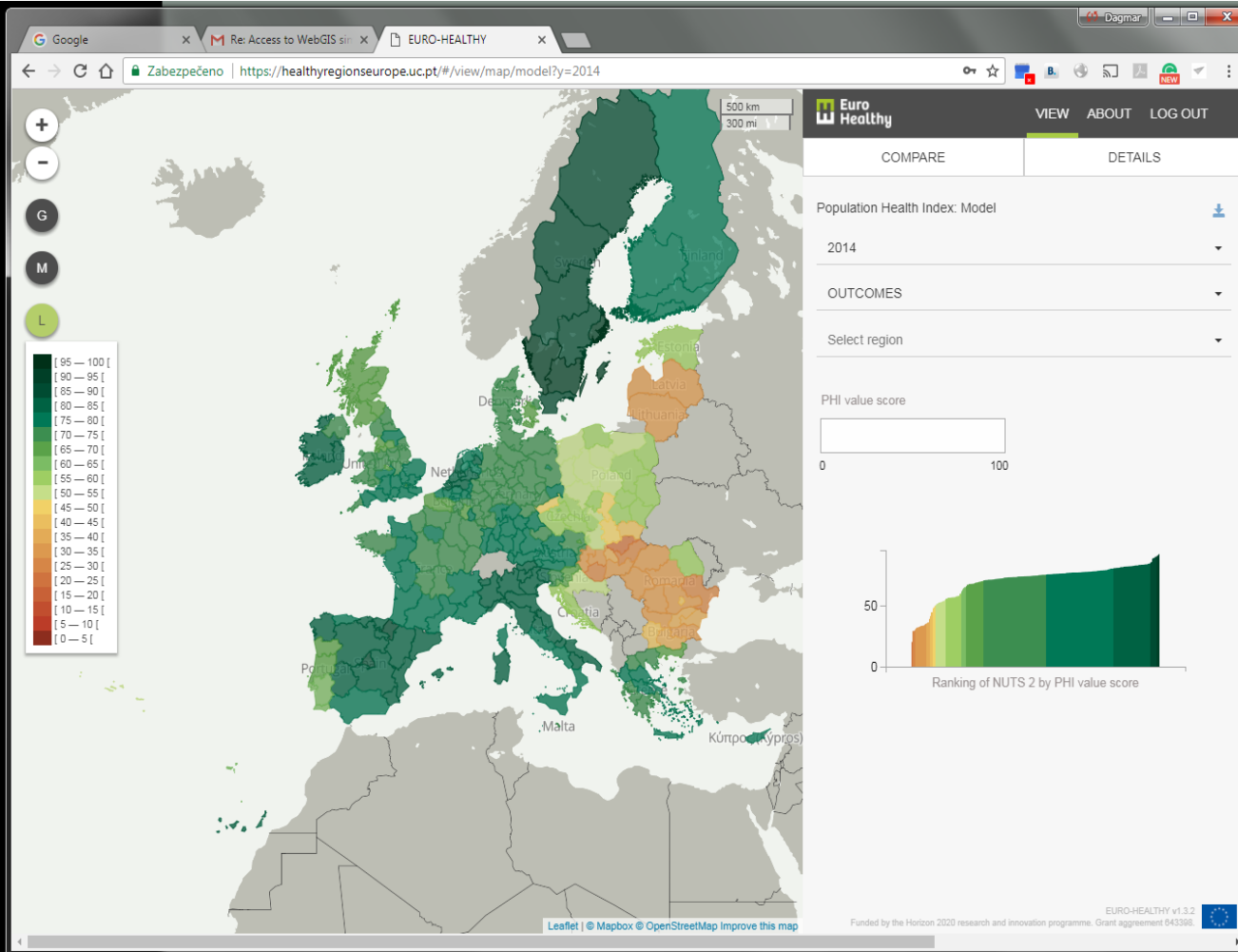
2 EURO-HEALTHY books:

- **Promoting population health and equity in Europe: from evidence to policy**
<https://doi.org/10.14195/978-989-26-1500-4>
- **Atlas of population health in European Union regions**
<https://doi.org/10.14195/978-989-26-1463-2>



WEB GIS platforma

<https://healthyregionseurope.uc.pt>



Magister. studijní obor SOCIÁLNÍ EPIDEMIOLOGIE

socialniepidemiologie.natur.cuni.cz/

SP: Epidemiologie
SO: Sociální epidemiologie

- Nově akreditované interdisciplinární studium
- Zahájení akademický rok 2015/2016
- Ve spolupráci s partnery z University College London, Research Department of Epidemiology and Public Health



Navazující magisterský studijní obor
Sociální epidemiologie
otevřeno v roce 2015

Studijní program
EPIDEMIOLOGIE

Sociální epidemiologie je nově otevřený **dvouletý navazující magisterský studijní obor** studijního programu Epidemiologie založený na nejnovějších poznatcích věd přírodních i společenských (biologie, chemie, demografie, geografie) v oblasti zdraví člověka.

Studium je z hlediska šíře poskytovaného vzdělání a zejména hloubky teoretického a praktického osvojení jednotlivých poznatků na vysokých školách v ČR unikátní.

GEOGRAFICKÁ SEKCE
Přírodovědecká fakulta
Univerzity Karlovy v Praze

Albertov 6, 128 43 Praha 2
www.natur.cuni.cz/geografie



Proč studovat tento obor?

Studiem oboru Sociální epidemiologie získám ucelené znalosti a dovednosti z oblasti výzkumu zdraví a jeho sociálních determinant.

Porozumím problematice prevence a léčby nemocí, zdravotní politiky, nerovností ve zdraví či rizikového chování obyvatel.

Naučím se pracovat s programy na zpracování statistických dat, geoinformačními systémy a osvoji si některé laboratorní postupy.

Vylepším si jazykové znalosti a dovednosti studiem cizojazyčné literatury, na přednáškách a diskuzích se zahraničními hosty (studium je organizováno ve spolupráci

s University College of London), při zapojení do mezinárodních projektů či díky stáží v rámci programu ERASMUS na některé z několika desítek partnerských univerzit po celé Evropě.



Studijní plán oboru sociální epidemiologie

1. úsek studia

Povinné předměty

Kód	Název	Rozsah	Kr.	Sem.
MZ340E10	Demografie pro epidemiology ^{N 1}	2/1 Z+Zk	5	Z
MZ370P50	GIS v epidemiologii	2/1 Z+Zk	4	Z
MZ340E06	Diplomový projekt I (Sociální epidemiologie)	0/0 Z	4	Z
MZ340E02	Základy epidemiologie	2/2[D] Z+Zk	5	L
MD360P05	Statistická analýza dat I	2/2 Z	4	L
MZ340E04	Metody sběru epidemiologických dat	1/1 Z+Zk	4	Z
MZ340E07	Diplomový projekt II (Sociální epidemiologie)	0/0 Z	9	L
Povinné předměty celkem			35	

¹ Nově zařazeno od 2016/17, nahrazuje MZ340E01.

2. úsek studia

Povinné předměty

Kód	Název	Rozsah	Kr.	Sem.
MZ340P70	Statistická analýza dat II ^{PN 2}	2/2 Z+Zk	5	Z
MZ340E08	Diplomový projekt III (Sociální epidemiologie)	0/0 Z	16	Z
MZ340E05	Sociální epidemiologie	2/2[D] Z+Zk	5	L
MZ340E09	Diplomový projekt IV (Sociální epidemiologie)	0/0 Z	20	L
Povinné předměty celkem			46	

První absolventi sociální epidemiologie

Promoce 2017





PŘÍRODOVĚDECKÁ
FAKULTA
Univerzita Karlova



Děkuji za pozornost

socialniepidemiologie.natur.cuni.cz/
geoqol.natur.cuni.cz/

dzurova@natur.cuni.cz