



FONDAZIONE IRCCS
ISTITUTO NAZIONALE
DEI TUMORI



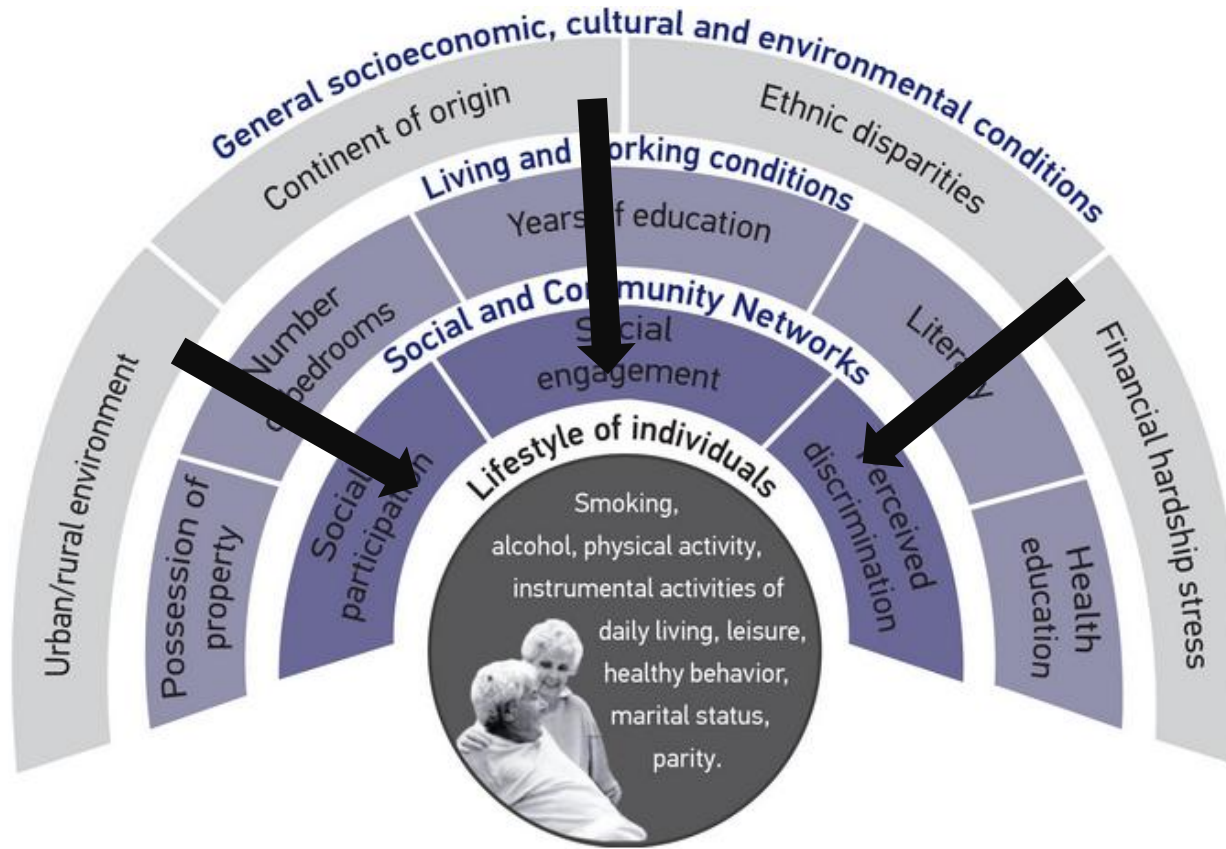
WASABY – WP5

Relevant deprivation index
For international studies in Europe

European Deprivation Index

Social determinants for health.

A multi-level multifactorial model



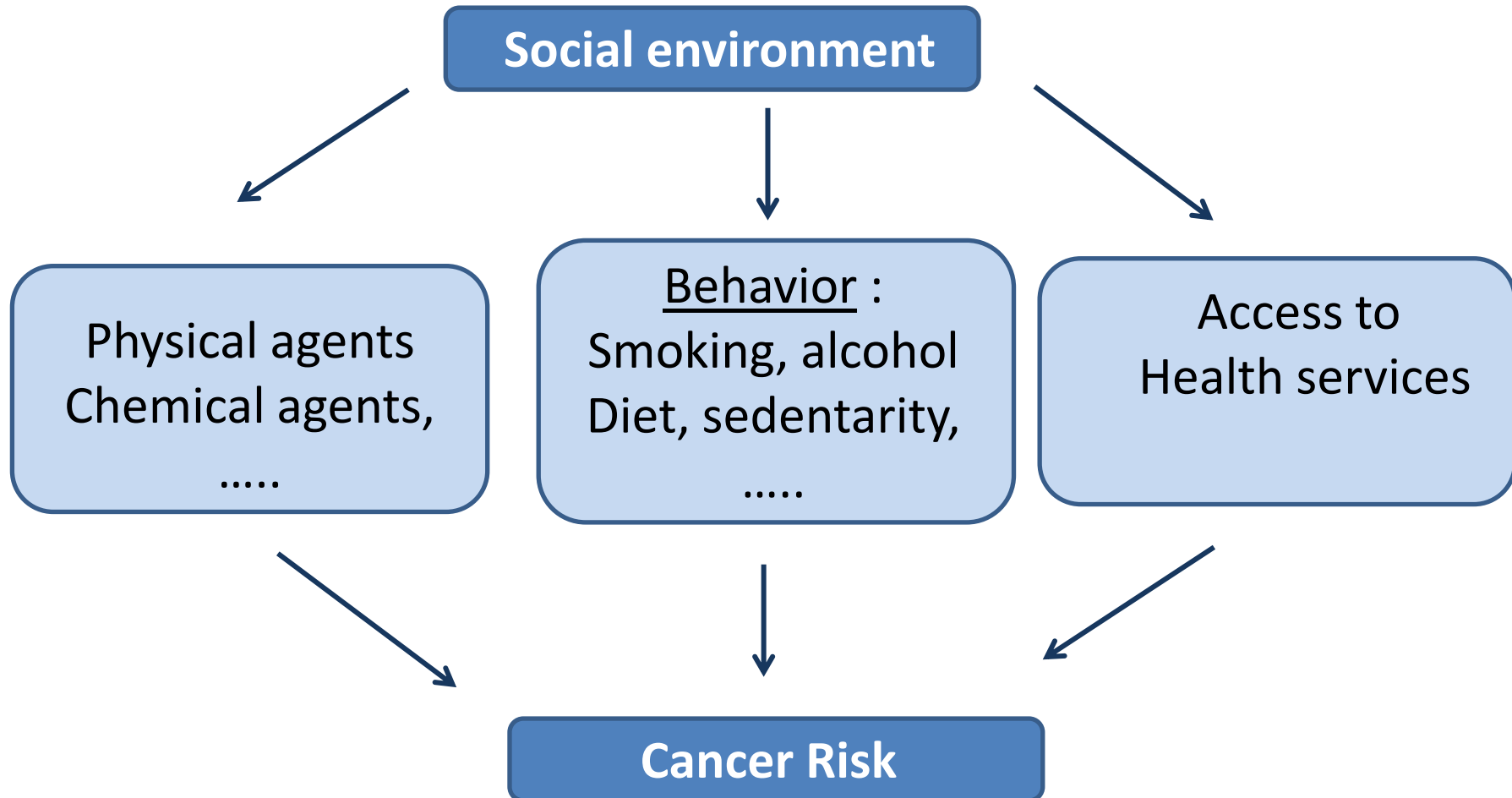
Dahlgren – Whitehead model

Individual, community and collective factors

Proximal and distal factors

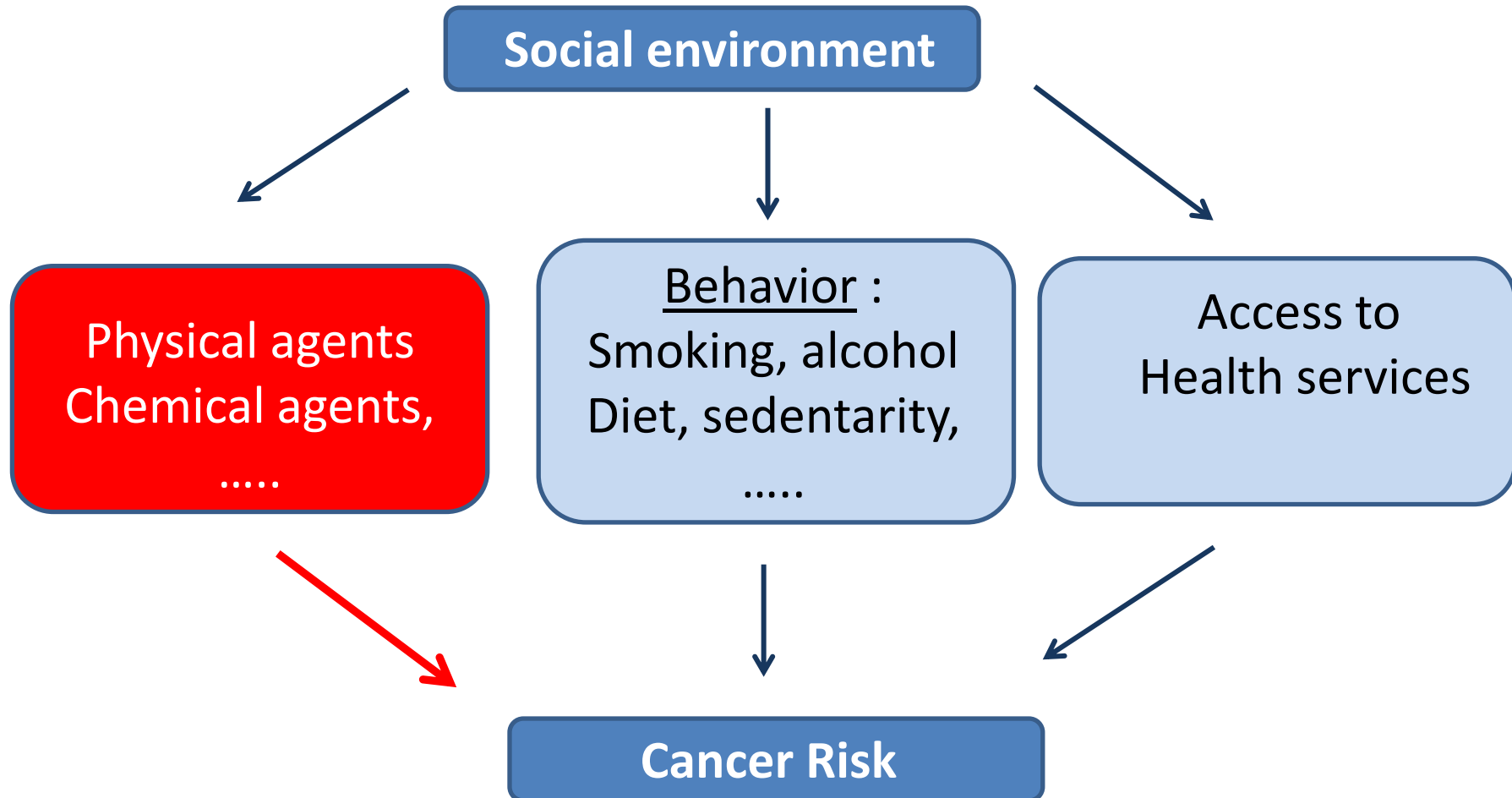
Social determinants for health.

A multi-level multifactorial model



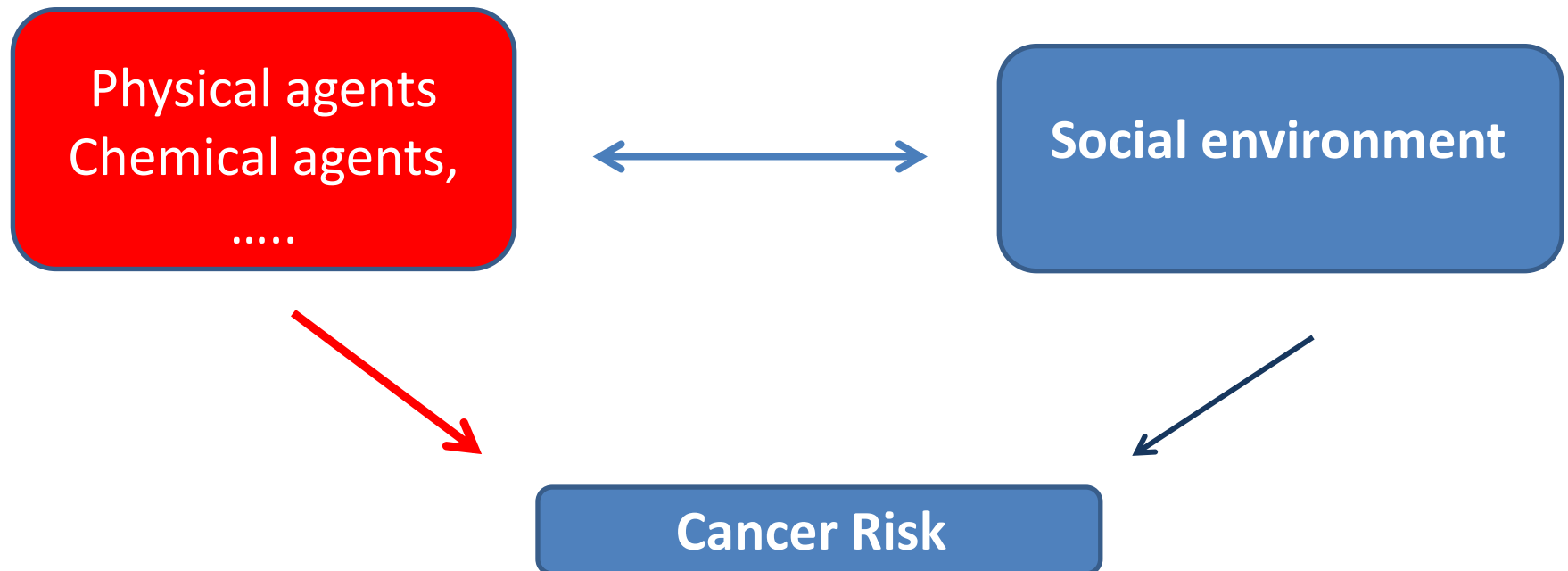
Social determinants for health.

A multi-level multifactorial model



Social environment. A factor to consider in environmental studies

International studies : the need of comparability



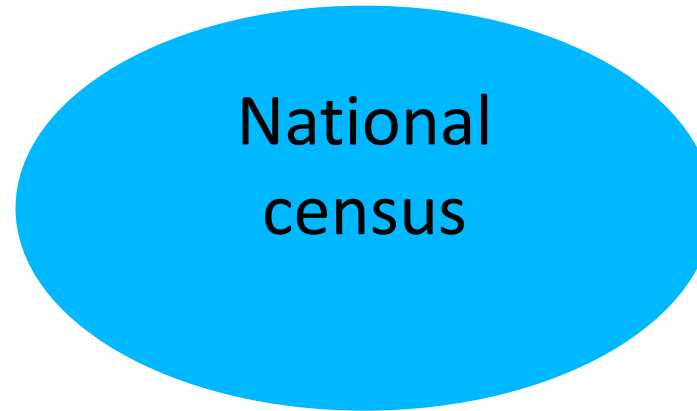
Assessment of socioeconomic environment

Challenges for population-based cancer registration in Europe

- To propose an aggregated-level social deprivation index based on relevant and proven concepts ...
- Which **measure the social environment in a comparable manner, or at least transferable way across countries, despite the social and cultural specificities of each country concerned**

➔ *The purpose of a European Deprivation Index*

General principles for construction



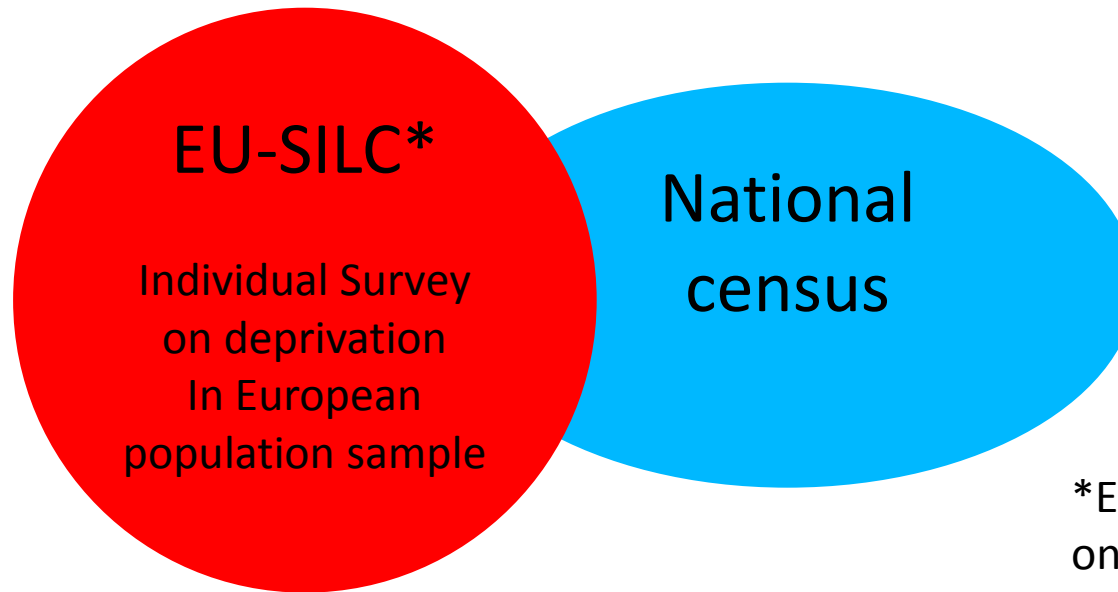
a way of construction identical in every European country

Relative Deprivation concept

Townsend in 1979: *“Poverty can be defined objectively and applied consistently only in terms of the **concept of relative deprivation**. [...] Individuals, families and groups in the population can be said to **be in poverty when they lack the resources to obtain the type of diet, participate in the activities and have the living conditions and amenities which are customary, or at least widely encouraged or approved, in the societies to which they belong**. Their resources are so seriously **below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs or activities**.”* (Townsend, 1979)

➔ *The purpose of a European Deprivation Index*

General principles for construction



*European Union-Statistics
on Income Living Conditions

a way of construction identical in every European country

The use of relative deprivation with data derived from a common European data base



EU statistics on income and living conditions
(EU-SILC) methodology

Cross-sectionnal and longitudinal sample survey providing data on income, poverty, social exclusion and living conditions in the European Union.

European standardised questionnaire specifically devoted to relative deprivation : ***Nine questions , common to EU members, evaluating material deprivation***

➔ *The purpose of a European Deprivation Index*

General principles for construction

The principle of construction of EDI is to construct a country-specific ecological deprivation index that best reflects individual experience of deprivation using the European Union Statistic Income and Living conditions survey (EU-SILC) and selects ecological variables from national census that fit the best with individual deprivation indicator

➔ *The purpose of a European Deprivation Index*

General principles for construction

The principle of construction of EDI is to construct a country-specific ecological deprivation index that best reflects individual experience of deprivation using the European Union Statistic Income and Living conditions survey (EU-SILC)

and selects ecological variables from national census that fit the best with individual deprivation indicator






Selection of fundamental needs associated with objective and subjective poverty

EU-SILC

Individual
deprivation
indicator

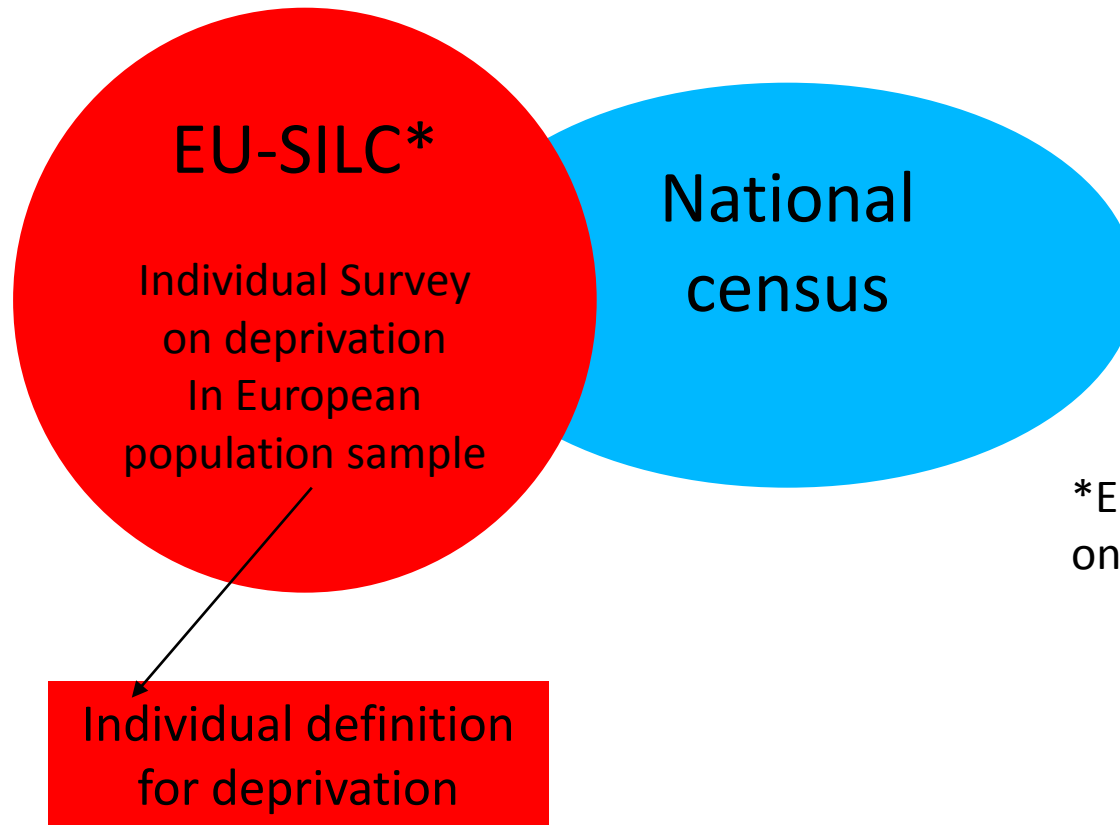
1. Selection of fundamental needs (9 items)

% people **not** having

Goods or services not possessed by less than 50% Of households because they could not afford it.					
Eating a meal containing some meat or some fish or the vegetarian equivalent once every two days	6.7	6.2	4.4	4.0	5.0
Taking a week's annual holiday away from home	32.5	38.7	***	38.3	22.7
Using your own means to cover a necessary yet unplanned expense	34.1	28.4	18.2	31.2	28.8
Keeping your house adequately warm	6.7	10.4	41.6	9.3	4.9
Having a phone (including mobile phone)	0.9	1.5	5.4	0.5	0.2
Having a colour TV	0.4	0.5	1.1	0.1	0.1
Having a computer	8.3	***	***	9.0	5.7
Having a washing machine	1.4	0.8	4.8	0.4	0.8
Having a personal car	4.6	3.8	11.6	4.8	5.3

➔ *The purpose of a European Deprivation Index*

General principles for construction



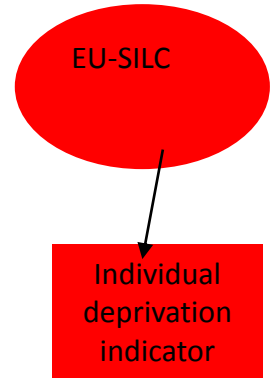
Selection of fundamental needs associated
with objective and subjective poverty

a way of construction identical in every European country

➔ *The purpose of a European Deprivation Index*

General principles for construction

Selection of fundamental needs
associated with objective and subjective poverty



Fundamental Needs : The goods/services that less than 50% of households does not have because they cannot afford it

Objective poverty : Eurostat definition : An individual is considered as poor when her/his household has a standard of living below 60% of the median standard of living among the whole national population

Subjective poverty : Question on « Ability to make ends meet »

➔ *The purpose of a European Deprivation Index*



General principles for construction

Selection of fundamental needs

associated with objective and subjective poverty

EU-SILC

Individual
deprivation

Fundamental needs for people in Spain	Objective poverty OR (95% CI)	Subjective poverty OR (95% CI)
Eating a meal containing some meat or some fish or the vegetarian equivalent once every two days	1.12 (0.85-1.48)	1.96 (1.24-3.09)
Taking a week's annual holiday away from home	2.68 (2.34-3.06)	5.65 (4.92-6.48)
Using your own means to cover a necessary yet unplanned expense	1.90 (1.67-2.17)	5.34 (4.50-6.32)
Keeping your house adequately warm	1.47 (1.22-1.76)	1.28 (0.94-1.74)
Having a phone (including mobile phone)	2.17 (1.04-4.52)	2.85 (0.77-10.6)
Having a colour TV	1.39 (0.39-4.91)	0.27 (0.06-1.21)
Having a computer	1.22 (1.01-1.48)	3.36 (2.44-4.64)
Having a washing machine	1.84 (0.77-4.39)	2.69 (0.32-22.76)
Having a personal car	1.23 (0.95-1.59)	1.87 (1.20-2.92)

➔ *The purpose of a European Deprivation Index*

General principles for construction

End of the phase 1



➔ *The purpose of a European Deprivation Index*

General principles for construction

The principle of construction of Edi is to construct a country-specific ecological deprivation index that best reflects individual experience of deprivation using the European Union Statistic Income and Living conditions survey (EU-SILC) and selects ecological variables from national census that fit the best with individual deprivation indicator

➔ *The purpose of a European Deprivation Index*

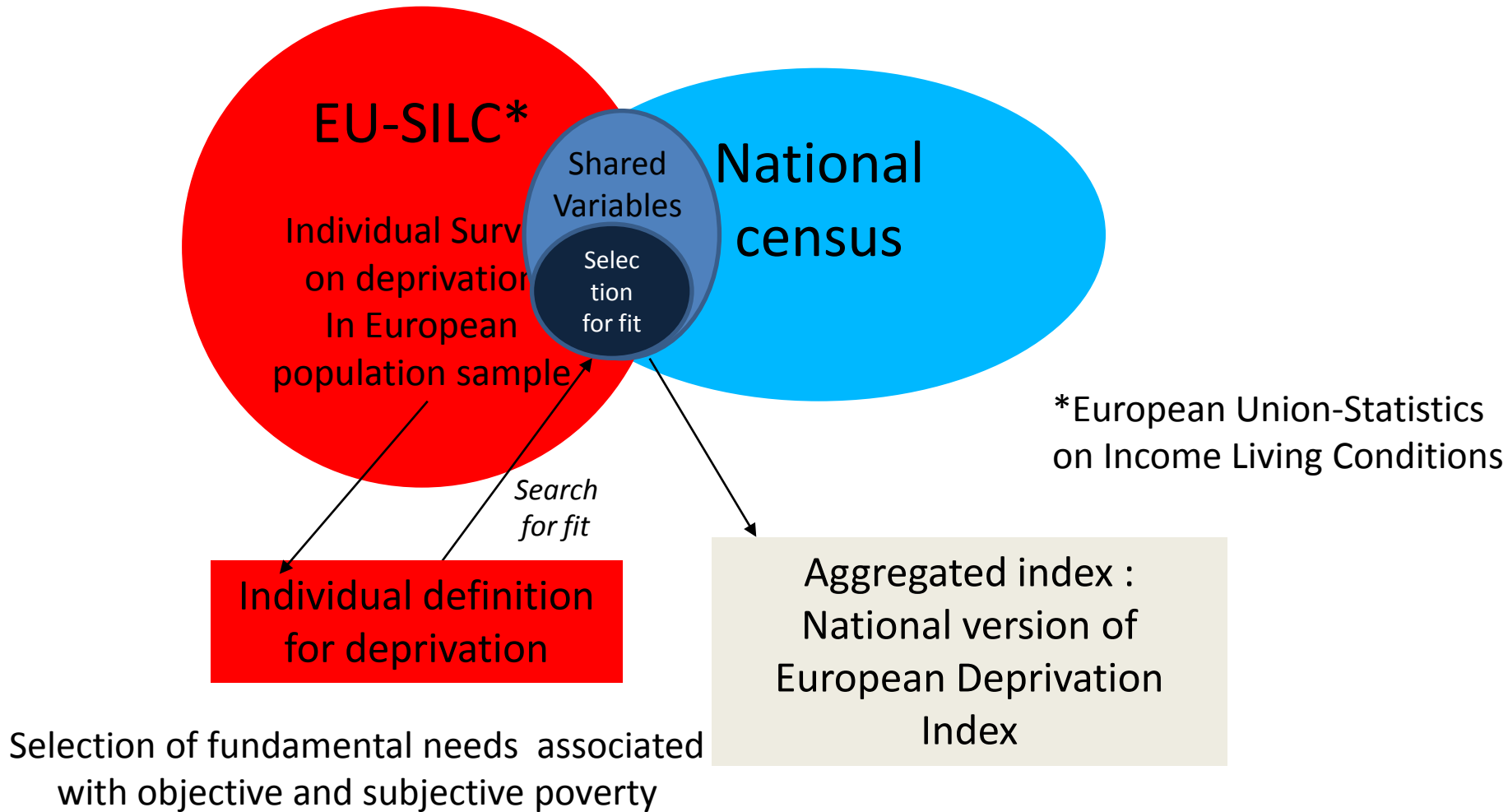
General principles for construction

**The principle of construction of Edi is to construct
a country-specific ecological deprivation index
that best reflects individual experience of deprivation
using the European Union Statistic Income
and Living conditions survey (EU-SILC)**

**and selects ecological variables from national census
that fit the best with individual deprivation indicator**

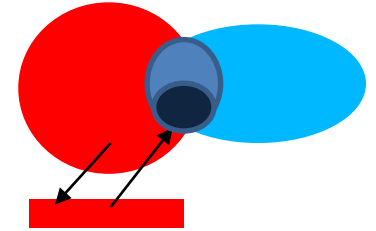
➔ *The purpose of a European Deprivation Index*

General principles for construction



a way of construction identical in every European country

Assessment of socioeconomic environment in international perspective



9 variables included (among 13)

Individual Variables (EU SILC Study)	β	95% CI	P-value
Crime / vandalism	0.487	0.379 - 0.595	<0.001
Bathroom or shower	1.327	0.302 - 2.353	0.011
Car	1.739	1.525 - 1.953	<0.001
Tenure status	0.729	0.619 - 0.839	<0.001
Overcrowding	0.990	0.768 - 1.212	<0.001
Status in employment	0.953	0.654 - 1.253	<0.001
Occupation	0.619	0.519 - 0.719	<0.001
Marital status	0.373	0.283 - 0.463	<0.001
Education level	1.304	1.166 - 1.442	<0.001

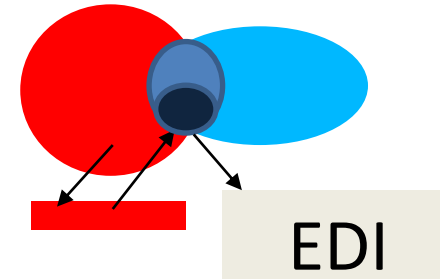
Assessment of socioeconomic environment in international perspective



9 variables included (among 13)

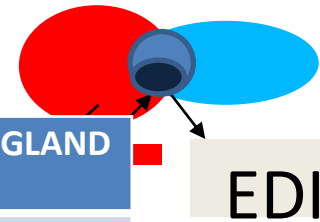
Aggregated Variables (Census)	w
Crime / vandalism	0.487
Bathroom or shower	1.327
Car	1.739
Tenure status	0.729
Overcrowding	0.990
Status in employment	0.953
Occupation	0.619
Marital status	0.373
Education level	1.304

Final Step



Assessment of socioeconomic environment in international perspective

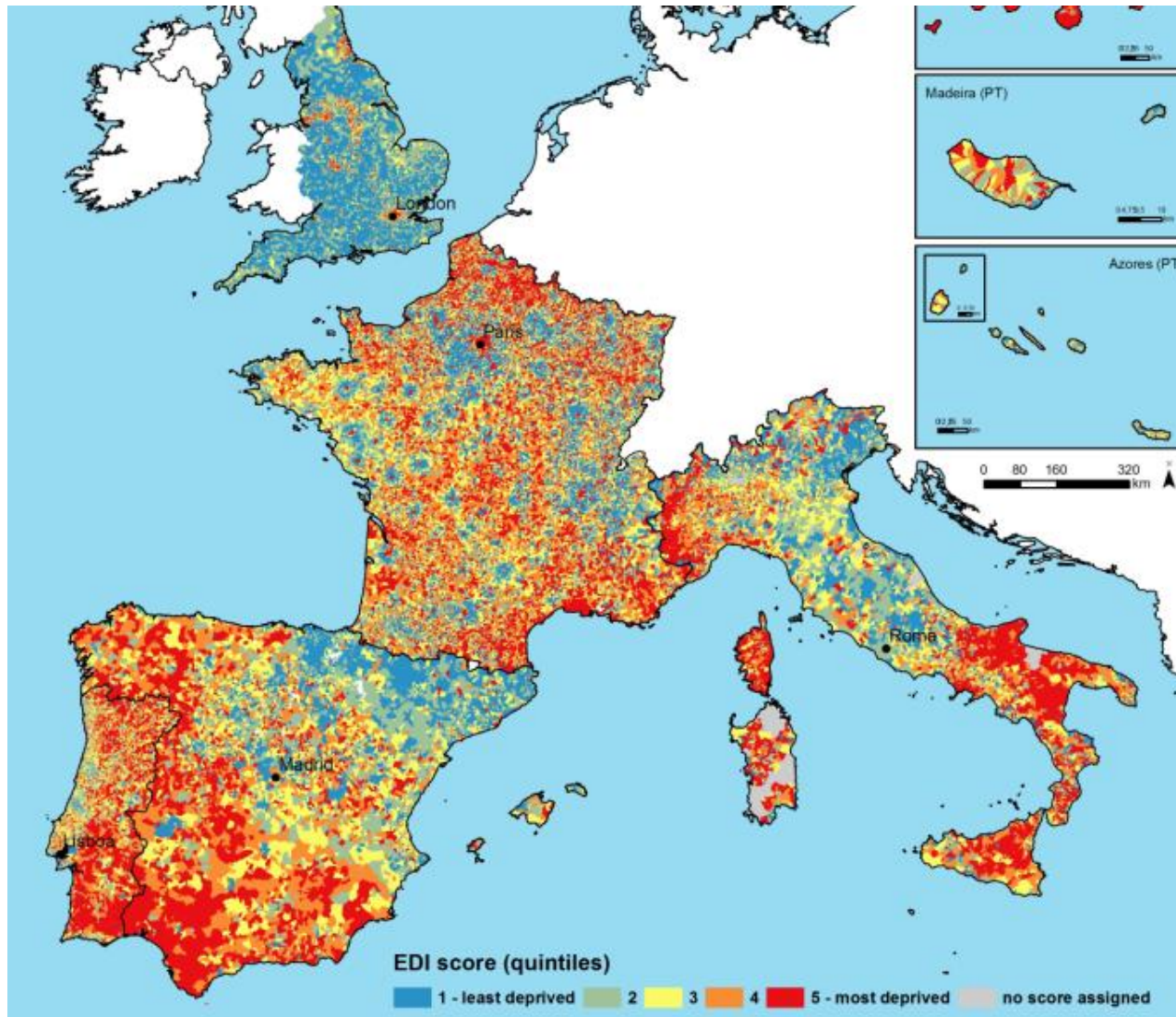
Final Step



Census variable (Rate)	ITALY	PORTUGAL	SPAIN	FRANCE	ENGLAND
No-high education level	+1.07	+1.29	+1.30	+1.17	+0.31
No bath or shower	+ 2.08	+0.06	+1.33	+0.71	-----
Non-owner	+1.07	+1.19	+0.73	+1.02	+1.46
No Indoor flushing	+ 0.56	+1.46	-----	-----	-----
No Married	+0.15	-----	+0.37	-----	+0.45
Women aged > 65 years	+ 0.33	+0.25	-----	-----	-----
Promiscuity	0.83	0.40	0.99	0.21	0.95
Low-income occupations	+0.19	+0.01	+0.62	+0.57	+0.39
Unemployed	+1.18	+0.74	-----	+0.94	-----
Foreign nationality	-----	-----	-----	+0.41	-----
Household with ≥6 persons	-----	-----	-----	+0.97	-----
Crim/Vandalism	-----	-----	+0.49	-----	-----
No employer with employees	-----	-----	+0.95	-----	-----
No car	-----	-----	+1.74	+0.71	+0.83
Single-parent household	-----	-----	-----	+1.00	+1.35
No detached house	-----	-----	-----	-----	+0.85
Permanently disabled	-----	-----	-----	-----	+0.98

Development of a cross-cultural deprivation index in five European countries

Elodie Guillaume,¹ Carole Pernet,^{1,2} Olivier Dejardin,^{1,2} Ludivine Launay,^{1,3}
Roberto Lillini,^{4,5} Marina Vercelli,⁵ Marc Mari-Dell'Olmo,^{6,7,8} Amanda Fernández Fontelo,⁷
Carne Borrell,^{6,7,8,9} Ana Isabel Ribeiro,¹⁰ Maria Fatima de Pina,¹⁰ Alexandra Mayer,¹¹
Cyrille Delpierre,^{12,13} Bernard Rachet,¹⁴ Guy Launoy^{1,2}



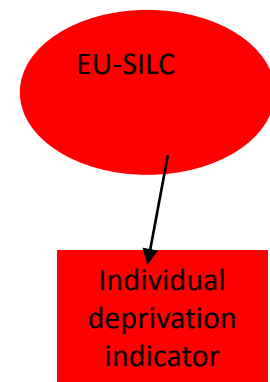


EDI Construction in Slovenia : example of a collaboration

- Vesna Zadnik came in the lab during 3 months for developping the index and applying it in incidence study
- Development of EDI : One month
- Difficulties :
 - census data were not available outside the national statistic office
 - Census data were available at individual level and data had to be aggregated for the third step in order to obtain an ecological index



Step1 : Selection of fundamental needs associated with objective and subjective poverty



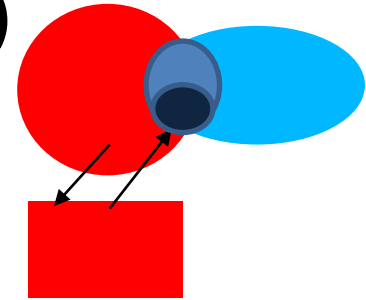
FUNDAMENTAL NEEDS SLOVENIA 2011	%
Capacity to afford paying for one week annual holiday away from home (HS040)	35.4
Capacity to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day (HS050)	12.4
Ability to keep home adequately warm (HH050)	6.4
Do you have computer (HS090)?	5.6
Do you have a car (HS110)?	5.5
Do you have a colour TV (HS080)?	0.7
Do you have a washing machine (HS100)?	0.5
Do you have a phone (HS070)?	0.3

=> 4 fundamental needs are associated with objective and subjective poverty

In Slovenia **households are defined as deprived if they could not afford at least one fundamental need** among four selected fundamental needs. They are defined as not deprived in all other cases.

Step 2 : identification of variables identically formulated and for which the response modalities are identical in both dataset (EU-SILC survey and census)

10 variables included (among 16)



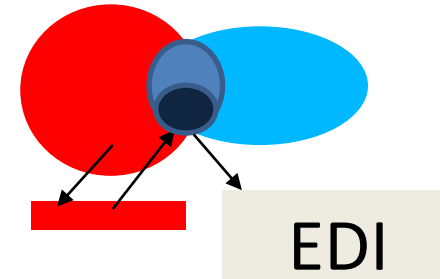
households Variables (EU SILC Study)	Prilviaged category	Deprived category
Country of birth	Slovenian	Others
Citizenship	Slovenian	Others
Tenure Status	Owner	Not Owner
Household size	3+ members	<3members
Bathroom or shower	Yes	No
Marital status	Married	Not married
Education	Achieved secondary education or more	Achieved lower secondary education or less
Professional Activty	Employed and self-employed	Others
Months unemployed	<3months	3+ months
Occupation	Others	Elementary occupations



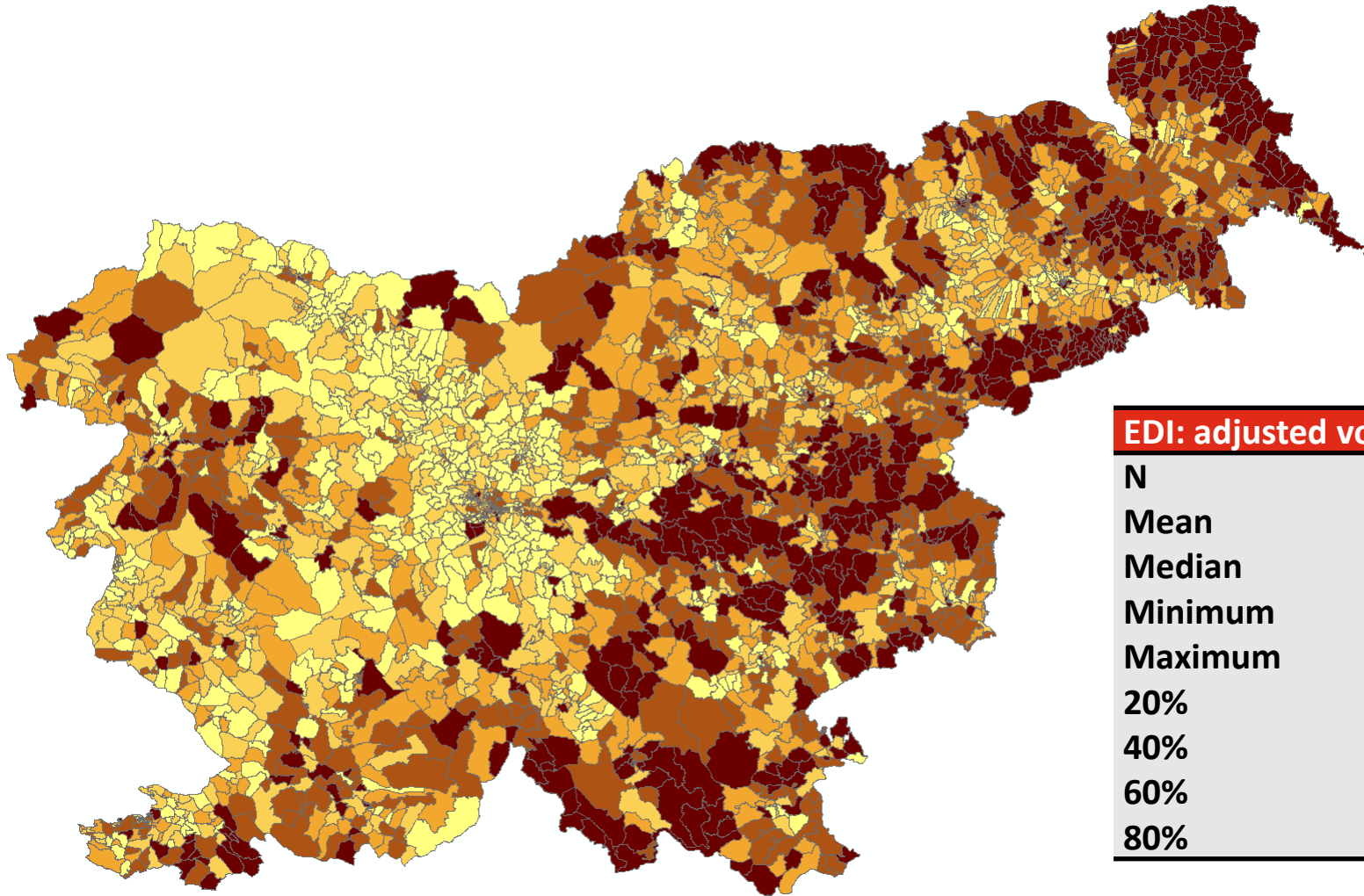
Step 3 : Ecological step

Weight

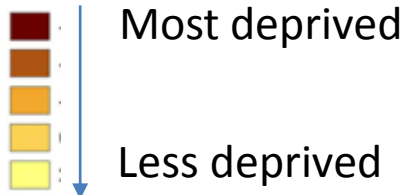
$$\begin{aligned} \text{Score}_i = & 0.321 * \text{Country_birth} \\ & + 0.368 * \text{Citizenship} \\ & + 0.215 * \text{Tenure_status} \\ & + 0.322 * \text{Household_size} \\ & + 2.423 * \text{Bathroom_shower} \\ & + 0.362 * \text{Marital_status} \\ & + 0.870 * \text{Education} \\ & + 0.554 * \text{Professional_activity} \\ & + 0.806 * \text{Months_unemployed} \\ & + 0.698 * \text{Occupation} \end{aligned}$$



SI-EDI: ADJUSTED VOTING UNITS



EDI: adjusted voting units	
N	3104
Mean	0,0107
Median	-0,8473
Minimum	-7,43
Maximum	40,33
20%	-2,8998
40%	-1,5380
60%	0,0195
80%	2,2837



Slovenian Journal of Public Health
SLOVENIAN VERSION OF THE EUROPEAN DEPRIVATION INDEX AT
MUNICIPALITY LEVEL SLOVENSKA RAZLIČICA EVROPSKEGA KAZALNIKA
PRIMANJKLJAJA NA RAVNI OBCIN
--Manuscript Draft--

Perspective in WASABY Countries

		Status		
Slovenia Portugal Belgium Italy } update Spain Germany Northern Ireland Lithuania Poland	Year of Census	Step 1	Step 2	Step 3
	2011	X	X	X
	2011	X	X	X
	2011	X	X	
	2011	X	X	
	2011	X		
	2011	X		
	2011			
	2011	X		
	2011	X		

Step 1 : Preliminary results

Fundamental needs	Germany	Poland	Lithuania	Belgium	Spain	Italy	NI
Using your own means to cover a necessary yet unplanned expense of 800euros	×			×	×	×	
Taking a week's annual holiday away from home	×			×	×	×	×
Having a car	×	×		×	×	×	×
Eating a meal containing some meat or some fish or the vegetarian equivalent once every two days	×	×	×			×	×
Having a computer	×	×	×		×		
Keeping your house sufficiently warm	×	×		×	×	×	
Having a washing machine		×	×				
Having a colour TV							
Having a phone (including mobile phone)		×					×
number of missing fundamentals needs	2	2*	1	2	2	2	1
household deprived (%)	27,49	14,77	32,79	23,12	32,41	36,98	30,58

Step 2 : DIFFICULTIES

- First the census data were not always reachable or not in English language
- Variable should not have the same response modalities :

Example for
Belgium

				Example for Belgium
EU-SILC				
PL040	Basic activity status	ACTIVITY_STATUS		
	1 Self-employed with employees	1 Self-employed		=> EU-SILC concerns only people more than 15 years old
	2 Self-employed without employees	1 Self-employed		
	3 Employee	2 Employee		
	4 Family worker	2 Employee		
CENSUS 2011				
Modality	Description	ACTIVITY_STATUS		
	1,0 employed			
	2,0 Self-employed without employees			
	3,0 people less than 15 years old			
	4,1 family worker			
	4,2 member of producers' co-operatives			

Step 2 : DIFFICULTIES

- Smallest geographic unit for census data in WASABY countries

	Total population	Year of Census	Smallest geographical unit	Average population	N° of units
Slovenia	2,050,189	2011	Adjusted voting units	660	3,104
Italy	59,433,744	2011	Census tracts	170	374,205
Portugal	10,562,178	2011	Census tract block groups	584	18,084
Spain	46,815,910	2011	Census tracts	1,000	34,300
Northern Ireland	1,810,863	2011	LSOA	1,500	
Belgium	11,000,638	2011	Statistical sector	557	19,748
Germany	80,219,695	2011	?		
Lithuania	2,921,262	2011	?		
Poland	38,044,565	2011	?		

Step 2 => the critical and longest step

	Year of Census	Status		
		Step 1	Step 2	Step 3
Slovenia	2011	X	X (V Zadnik)	X
Portugal	2011	X	X (A Ribeiro)	X
Belgium	2011	X	X (Sylvie Gadeyne, Hadewijch Vandenheede)	
Italy	2011	X	X	
Germany	2011	X	Ron Pritzkeleit	
Spain	2011	X	Marc Saez	
Northern Ireland	2011		Contact/Census	
Lithuania	2011	X	Contact/Census	
Poland	2011	X	Contact/Census	

WP5 Timetable

Country	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30	M31	M32	M33	M34	M35	M36		
Belgium	Step 1	Step2									Step 3				D5.1 Report on deprivation index available data											D5.2 Report on European Deprivation Index												
Germany	Step 1							Step2								Step 3																						
Italy	Step 1	Step2								Step 3																												
Lithuania	Step 1						Step2							Step 3																								
Poland	Step 1							Step2								Step 3																						
Portugal	Step 3																																					
Slovenia	Step 3																																					
Spain	Step 1	Step2									Step 3																											
Northern Ireland	Step 1						Step2									Step 3																						

STEP 1 : Preliminary results

Fundamental needs	Germany	Poland	Lithuania	Belgium	Spain	Italy	NI
Using your own means to cover a necessary yet unplanned expense of 800euros	37,4	-	-	27,1	37,8	39,5	35
Taking a week's annual holiday away from home	24,5	-	-	30,5	40	46,8	28
Having a car	11,3	12	16,7	9	5,7	3,3	6,5
Eating a meal containing some meat or some fish or the vegetarian equivalent once every two days	10,9	15,7	26,8	5,7	3,3	13,2	5,4
Having a computer	6,9	8,4	11,9	4,8	5,2	3,4	3,4
Keeping your house sufficiently warm	6,1	15,4	37,9	7,3	6,4	18,5	6,6
Having a washing machine	1	0,9	5,2	2,7	0,3	0,5	0,5
Having a colour TV	0,7	0,7	0,8	1	0,2	0,4	0,2
Having a phone (including mobile phone)	0,5	1,3	3,2	0,4	0,7	0,2	0,1
Subjective poverty : threshold	3	2	1*	2	2	2	2

STEP 1 : Preliminary results

Fundamental needs	Germany	Poland	Lithuania	Belgium	Spain	Italy	NI
Using your own means to cover a necessary yet unplanned expense of 800euros	×			×	×	×	
Taking a week's annual holiday away from home	×			×	×	×	×
Having a car	×	×		×	×	×	×
Eating a meal containing some meat or some fish or the vegetarian equivalent once every two days	×	×	×			×	×
Having a computer	×	×	×		×		
Keeping your house sufficiently warm	×	×		×	×	×	
Having a washing machine		×	×				
Having a colour TV							
Having a phone (including mobile phone)		×					×
number of missing fundamentals needs	2	2*	1	2	2	2	1
household deprived (%)	27,49	14,77	32,79	23,12	32,41	36,98	30,58