Economic and personal security as part of quality of life of EU member states
Ekonomická a osobní bezpečnost jako součást kvality života zemí EU

Mgr. Tetiana Korovchenko

Ústav regionálních a bezpečnostních věd	Institute of Regional and Security Sciences
Fakulta ekonomicko-správní	Faculty of Economics and Administration
Univerzita Pardubice	University of Pardubice
✉ *Studentská 95, 532 10, Pardubice, Czech Republic*	
E-mail: tetiana.korovchenko@upce.cz	

doc. Ing. Ivana Kraftova, CSc.

Ústav regionálních a bezpečnostních věd	Institute of Regional and Security Sciences
Fakulta ekonomicko-správní	Faculty of Economics and Administration
Univerzita Pardubice	University of Pardubice
✉ *Studentská 95, 532 10, Pardubice, Czech Republic*	
E-mail: Ivana.Kraftova@upce.cz	

Annotation

The article focuses on one of the important components of quality of life, namely security, more specifically economic and personal safety. The aim of the article is to compare the status of the relevant selected indicators in the EU Member States, their variability and the changes that took place between 2010 and 2015. In order to compare the overall situation, one composite indicator is constructed consisting of two subsets of basic indicators from the field of economic and personal security. Indicator values are standardized, variability is measured by the coefficient of variation. Research did not confirm the hypothesis to improve the value of the composite economic and personal safety indicator in 2015 against 2010; in four Member States, the situation (albeit slightly) worsened. Neither the assumption of a reduction in the variability of the individual indicators has been confirmed; apart from the material deprivation indicator, the variation coefficient has increased in all cases. It has also been demonstrated that the variability of personal safety indicators significantly outstrips the variability of the economic security indicators of EU Member States.

Key words

quality of life, economic security, personal security, variability of composite indicator, EU member states

Anotace

Článek soustřeďuje pozornost na jednu z významných složek kvality života, a to na bezpečnost, konkrétně ekonomickou a osobní bezpečnost. Cílem článku je porovnat stav zvolených relevantních indikátorů v členských státech EU, jejich variabilitu a změny, k nimž došlo mezi lety 2010 a 2015. V zájmu porovnání celkového stavu je konstruován jeden kompozitní ukazatel, skládající se ze dvou podskupin bazálních indikátorů z oblasti ekonomické a osobní bezpečnosti. Hodnoty indikátorů jsou standardizovány, variabilita je měřena variačním koeficientem. Výzkum nepotvrdil hypotézu o zlepšení hodnoty kompozitního ukazatele ekonomické a osobní bezpečnosti v roce 2015 proti roku 2010; ve čtyřech členských zemích se situace (byť mírně) zhoršila. Ani předpoklad snížení variability jednotlivých ukazatelů se nepotvrdil; kromě ukazatele materiální deprivace se variační koeficient ve všech případech zvýšil. Prokázalo se také, že variabilita indikátorů osobní bezpečnosti výrazně převyšuje variabilitu indikátorů ekonomické bezpečnosti členských zemí EU.

Klíčová slova

kvalita života, ekonomická bezpečnost, osobní bezpečnost, variabilita kompozitního ukazatele, členské státy EU

1. Introduction

A variety of risks of different natures may threaten the material conditions of individuals and households in unforeseeable ways. Examples are losing one's job, impaired health, problems related to aging, or even events at the global level, as recently demonstrated through the financial crisis, which led to a sudden deterioration of the international economic environment. On the other hand, non-economic risks such as violence and crime may

endanger physical safety. Even when risks do not actually materialize, however, the subjective perception of a threat and the ensuing feelings of insecurity effectively undermine quality of life.

Canadian Policy Research Networks, (2001) summarized the collective portraits and priority themes for quality of life. In this research was addressed various aspects of political rights, safe communities and the economic security, health, social programs/conditions, personal well-being, as important to the quality of life in Canada. The general sense (Massam, 2002) was that there should be social support systems adequate to respond to and meet basic human needs and increase the level of social security as a first goal of public authorities. More and more it is accepted that economic growth measured as GDP will not automatically lead to greater satisfaction in people's lives, and Rokicka (2014) was thinking that economic security has appeared as another key quality of life, which included sub-themes such as job security, employment opportunities, and rates of compensation or concerns about the minimum wage.

Of course, the economic situation of a person, the absence of unemployment and poverty is one of the most important indicators in the system of quality of life assessment. The lower the risk of household or individual poverty, the greater the chances of a prosperous economic situation: for individuals, households and the population as a whole.

Poverty is generally understood as a situation where lack of money does not ensure basic needs at a reasonable level (Tomes, 1996). Eurostat establishes poverty based on the poverty threshold, which is equal to 60% of the median income of the given society. Consequences of poverty and social exclusion such as bad economic situation, higher crime rates or population migration (Balabán, 2009), but also many other negative aspects underline the importance of the need solutions to these problems, which is also declared in the fifth objective of the Europe 2020 Strategy to reduce the number of people at risk of poverty and social exclusion by 20 million.

Besides the Europe 2020 targets the EU regional policy has a substantial and long-term objective of reducing disparities between regions. In the recent years disparities of regions have been addressed not only in terms of basic economic indicators, such as gross domestic product or unemployment, but also in terms of social indicators (Tuleja, 2010; Otoiu, 2015). Without addressing these topics, the sustainable development of the EU countries or their individual regions can no longer be expected. A number of studies dealing with the reduction of regional disparities suggest that there is a gradual convergence between the EU Member States. However, there is rather divergence in their respective regions within their own countries (Horká, 2012, Zdražil, 2012, Otoiu, 2015). Most studies address the issue of convergence across regions regardless of the economic level (Kapuria, 2016; Okulicz-Kozaryn, 2018). Thus, it analyses convergence between less developed, transition and mature regions. After EU enlargement in 2004 disparities increased in the acceding countries due to the significant growth in gross domestic product within capital regions (Hloušková, 2016).

The second critical factor in evaluating the quality of life of people is a personal security. Personal security is an important precondition for well-being and the maintenance of good health. Personal security is primarily influenced by crime, the risk of traffic accidents and natural hazards. Crime may lead to a loss of possessions, physical suffering, stress and anxiety. The Security Agenda (European Commission, 2015) identifies three priorities for EU action, concentrating on areas where the Union can make a real difference. Terrorism and radicalisation are significant threats to the EU's internal security. Recent terrorist attacks in the EU have highlighted the need for a strong joint EU response, in particular to the returning foreign fighter phenomenon. While this issue is not new, the scale and the flow of fighters to and from the ongoing conflicts in Syria, Iraq and Libya, as well as the networked nature of these conflicts, are unprecedented. Organised crime has a huge human, social and economic cost – from migrant smuggling, human trafficking, trafficking of firearms, drugs or cigarettes, to environmental, financial and economic crime. Cybercrime offers a huge potential gain to criminals, as our lives, including commerce and banking, shift online. With more and more personal information stored in digital form, cybercrime undermines personal security and privacy. Criminals abuse modern technologies, such as the Internet, for illicit online trade in drugs and weapons or other criminal transactions. Improving the law enforcement and judicial response to cybercrime is a priority for European safety. To address these threats, should intend to strengthen and make more effective the exchange of information and the operational cooperation between member states, EU Agencies and the IT sector (European Commission, 2015).

When it comes to the EU-28 general population, no clear trend in perceptions of vandalism and crime has emerged in recent years. Overall, between 2008 and 2011, the percentage of the EU population that reported violent incidents in their areas dropped slightly. However, these general figures mask significant differences between EU member states. For example, although there was a marked drop in reported vandalism and crime

between 2008 and 2011 in Finland, Latvia, Spain and the United Kingdom, there were steep increases in Cyprus, Greece, and Bulgaria (Otoiu, 2015).

2. Goals and methods

To fulfil the objectives of the EU it is certainly important not only wealth creation, improving the quality of life of its inhabitants, but also reducing disparities in the region, which is known as the economic and personal security, and that is increasingly on the agenda of academic and professional discussions and political negotiations.

It is precisely this area that the research focuses on. It aims to
a) compare the position of EU countries using the composite indicators on economic and personal security, while allowing its decomposition into sub-groups or sub-groups of indicators;
b) to determine the evolution of the variability of the indicators selected for assessing economic and personal security within the EU member states.
With the stated goals are linked following hypotheses:
a. The position of all EU countries between 2010 and 2015 in the aggregate in the economic and personal security has improved, although it may not apply for the position of the individual elements of a composite indicator of the individual countries.
b. Variability indicators of both groups of indicators - economic and personal security – decreased in 2015 compared to 2010, while the average coefficient of variation for both areas are at the similar level.

28 EU Member States were surveyed in 2010 and 2015. For the research of economic and personal security as part of the quality of life in the EU member states there have been used three indicators of economic security (RIPT, MADE a DEMD); 4 personal security indicators (INHO, ASSA, ROBB and UADR) plus 2 economic indicators reflecting the age aspect (YOUN and RIEP). (For a list of acronyms, see table 1, and for more detailed information see Appendix 1). The mentioned indicators - except RIEP - are minimizing, i.e. in order to improve the quality of life, it is desirable to minimize them.

Tab. 1: Overview of the basal (baseline) indicators and their acronyms

Akronym	Description
RIPT	at risk of poverty rate after social transfers
MADE	material deprivation rate
DEMD	depth of material deprivation
INHO	intentional homicide
ASSA	assault
ROBB	robbery
UADR	unlawful acts involving controlled drugs or precursors
YOUN	youth unemployment rate
RIEP	median relative income of elderly people (60+)

Source: own processing

A composite comparison of the situation of economic and personal security by using selected indicators allowed by the composite indicator (Formula 2) using the standardization of spans (Formula 1).

$$y_{ij} = \frac{x_{ij} - \min(x_j)}{\max(x_j) - \min(x_j)} \tag{1}$$

where: y – the standardized value; x – the variable; i - the country; j – the pointer

$$y_{EPS} = \sum [y_{RIPS} + y_{MD} + y_{CR} + y_{YOUN} + (1 - y_{RIEP})] \tag{2}$$

where y_{EPS} = the composite indicator of economic and personal security as the sum of the standardized values RIPS, YOUN and if RIEP its recalculation into one, given that it is a maximization indicator, further sum of y_{MD} and y_{CR};
y_{MD} is the standardized MD value (formula 3), i.e. the square root of the product of the indicators of the MADE and DEMD indicators, because it seems necessary to determine not only the percentage of people at risk of material deprivation but also to take into account the intensity of this deprivation;
y_{CR} is the sum of the standardized values of the various indicators of personal security (Formula 4).

$$y_{MD} = \sqrt{MADE * DEMD} \tag{3}$$

$$y_{CR} = \sum y_{INHO} + y_{ASSA} + y_{ROBB} + y_{UADR} \tag{4}$$

The result of the y_{EPS} composite indicator ranges from <0, 8> pointing to the overall position of each country in a group of EU member states in terms of economic and personal security. Similarly, y_{CR} indicator reaches values in the individual countries in the interval <0; 4> and allows to assess the position in the area of crime, respectively. personal safety. Other elements of the composite indicator range within the interval <0; 1> with an analogous evaluation possibility for the given element. A hypothesis α will be confirmed if the value of the composite indicator for all member countries for the year 2015 compared to 2010 is lower.

The second part of the analysis focuses on the assessment of the variability of the member states in terms of basal (baseline) indicators, only in the case of material deprivation, the y_{MD} indicator is assessed, i.e. the rate of persons at risk of material deprivation "weighed" by the intensity of this deprivation. The β hypothesis will be confirmed if the value of the variation coefficient for indicators in each of the economic and personal security areas is reduced by 2015 compared to 2010 and, at the same time, if the difference in the average of all measured values of the variation coefficient will not exceed 50 percentage points.

3. Results

The overall position of individual EU member states in terms of the composite indicator for economic and personal safety in 2010 and 2015 is shown in Figure 1 where countries are ranked upwards according to the 2010 y_{EPS} values. Overall there has been some improvement, which can be proved by the y_{EPS} median, which was about 2.59 in 2010, fell to 2.45 in 2015. Figure 1 shows that in 2010 the situation in economic and personal security was worse. Four countries have exceeded half of the y_{EPS} range, namely Lithuania, Belgium, Latvia and the Great Britain. However, the hypothesis α is not confirmed, or in four countries (Luxembourg, Malta, France and Italy) there was a slight deterioration in 2015, i.e. y_{EPS} increase.

Fig. 1: Development of economic and personal security of the EU between 2010 and 2015
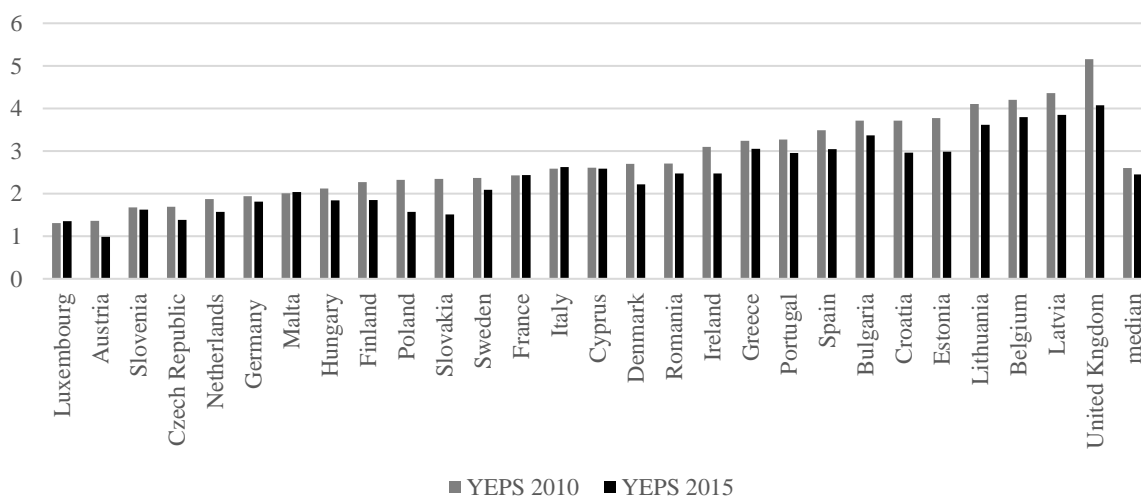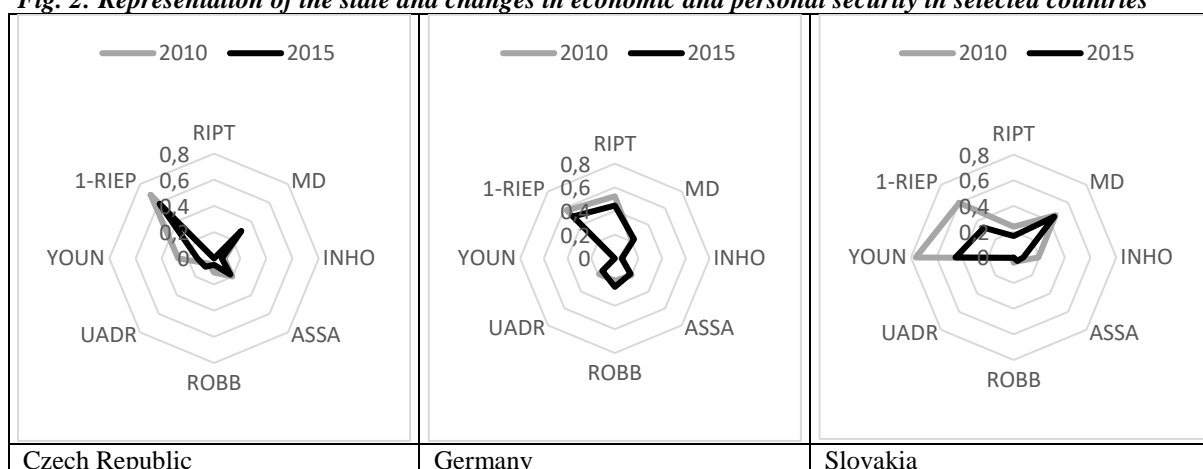

Sourse: own processing based on data (EUROSTAT, 2018a; EUROSTAT, 2018b)

Designed composite indicator y_{EPS} can be hierarchically decomposed for each country. As an example, for the eight indicators it is used graphical comparison of the three countries in Figure 2: the Czech Republic, which in 2015 moved from 4th place to 3rd; Germany, which on the contrary worsened from 6th place to 8th place and Slovakia, which saw the largest positive scoring jump from 11th place to 4th (larger reduction y_{EPS} is shown only by the Great Britain, but still remains in the last position.)

Tables 2 and 3 present the indicators of variability (min, max, variation coefficient) both of the evaluated economic and personal security indicators. At the same time, countries are noted at the minimum and maximum values (official abbreviations used in the EU), values which they achieved in the monitored years. It is satisfying that the Czech Republic maintains its minimal value at risk of poverty after social transfers. It is not surprising that the highest frequency of minimum values is achieved (across the years and economic security indicators) by Luxembourg, similarly to Romania which shows the maximum values of risk of poverty after social transfers and Bulgaria for material deprivation.

In the area of personal security indicators, the minimum value in one of the indicators (drug abuse) is kept by France, while the maximum value of this indicator remains in Denmark. In the indicator of murder and killing, Lithuania is "leading" in both years, similarly to Great Britain with infestation indicator, as shown in Table 3.

Fig. 2: Representation of the state and changes in economic and personal security in selected countries

Source: own processing based on data (EUROSTAT, 2018a; EUROSTAT, 2018b)

Tab. 2: Variability evaluated indicators of economic security

indicator	RIPT		MD		YOUN		RIEP*	
year	2010	2015	2010	2015	2010	2015	2010	2015
min	9,00	9,70	3,62	3,63	9,50	7,20	0,73	0,64
country (min)	CZ	CZ	LU	SE	AT	DE	CY	EE
max	21,60	25,40	16,53	14,86	41,50	49,80	1,08	1,10
country (max)	RO	RO	BG	BG	ES	EL	LU	LU
variation coefficient	0,21	0,23	0,37	0,34	0,36	0,51	0,10	0,13

* Min and max values must be considered the opposite, in terms of maximizing indicator.
Source: own processing based on data (EUROSTAT, 2018a; EUROSTAT, 2018b)

Tab. 3: Variability evaluated indicators of personal security

indicator	INHO		ASSA		ROBB		UADR	
year	2010	2015	2010	2015	2010	2015	2010	2015
min	0,54	0,49	7,73	1,50	11,57	9,94	9,08	11,25
country (min)	SI	AT	EE	RO	RO	SK	FR	FR
max	6,33	5,75	846,82	838,96	261,10	196,68	353,89	438,41
country (max)	LT	LT	UK	UK	UK	BE	DK	DK
variation coefficient	0,78	0,79	1,42	1,51	0,82	0,86	0,88	0,97

Source: own processing based on data (EUROSTAT, 2018a; EUROSTAT, 2018b)

Tables 2 and 3 also show that hypothesis b has not been confirmed: in addition to the MDI, all variables have been increased, as measured by the coefficient of variation. Moreover, there is no similarity in the variability of indicators on the one hand economic (average 0.28), on the other hand personal security (average 1.00), which is a difference of 72 percentage points.

Conclusion
This research has only focused on the level of states. To solve regional disparities, it would be necessary to conduct analysis at the level of NUTS 2 regions, respectively. NUTS 3. This intention is made more difficult by the absence of some data of the relevant regional level.
Thanks to the constructed composite index, we can determine in which EU member states the situation has improved and require state interventions and improvements in the security system. The results suggest that

economic and personal safety as part of the quality of life should continue to be one of the main topics of national and international regional policy as a result of improvements in the quality of life of the population.

References
BALABÁN, M., (2009). Globální nerovnost jako globální hrozba. *In: Česká republika - trendy, ohrožení, příležitosti.* 1. vyd. Praha: Karolinum, 2009, pp. 51-58. ISBN 978-80-246-1655-1.
CANADIAN POLICY RESEARCH NETWORKS, (2001). *Indicators of Quality of Life in Canada: A Citizens' Prototype. Quality of Life Indicators Project.* [online]. [cit. 15. 2. 2016]. Available at: https://uwaterloo.ca/canadian-index-wellbeing/sites/ca.canadian-index-wellbeing/files/uploads/files/Indicators_of_Quality_of_Life_in_Canada.sflb__0.pdf
EUROPEAN COMMISSION, (2010). *Europe 2020. A strategy for smart, sustainable and inclusive growth.* COM/2010/2020 final [online]. [cit. 6. 2. 2018]. Available on www: http://eur-lex.europa.eu
EUROPEAN COMMISSION, (2015). *The European Agenda on Security.* COM/20180/185 final [online]. [cit. 2018-02-06]. Available on WWW: http://eur-lex.europa.eu
EUROSTAT, (2013). *Quality of life indicators - economic and physical safety.* [online]. [cit. 2016-18-02]. Available from: http://ec.europa.eu/eurostat/statistics-explained/index.php/Quality_of_life_indicators_-_economic_and_physical_safety
EUROSTAT, (2018a). *EU-SILC survey.* [online]. [cit. 15. 2. 2018]. Available on www: http://ec.europa.eu/eurostat/.
EUROSTAT, (2018b). *Recorded offences by offence category - police data.* [online]. [cit. 16. 2. 2018]. Available on www: http://ec.europa.eu/eurostat/
HLOUŠKOVÁ, R., (2016). Threat of poverty or social exclusion in the less developed regions of the EU. *XIX Medzinárodní kolokvium o regionálních vědách. Sborník příspěvků. Brno: Masarykova univerzita*, pp. 461 – 467. ISBN 978-80-210-8272-4. DOI: 10.5817/CZ.MUNI.P210-8273-2016-59
HORKA, L., (2012). Regionální disparity a konvergence v kontextu politiky soudržnosti EU. *In XV. mezinárodní kolokvium o regionálních vědách. Sborník příspěvků. Brno: Masarykova univerzita,* pp. 28-35. ISBN 978-80-210-5875-0.
KAPURIA, P., (2016). A Human Well-Being Perspective to the Measurement of Quality of Life: Findings From the City of Delhi. *Springer,* vol. 117(2), pages 459-487, DOI: 10.1007/s11482-014-9358-7
CANADIAN POLICY RESEARCH NETWORKS, B., (2002). Quality of Life: public planning and private living. *Progress in planning 58*, pp. 141-227, DOI: 10.18869/NRIP.JSRD.1.1.3
OKULICZ-KOZARYN, A., VALENTE R., (2018). Livability and Subjective Well-Being Across European Cities, Applied Research in Quality of L,ife. *The Official Journal of the International Society for Quality-of-Life Studies*, ISSN: 1871-2576.
OTOIU, A., TITAN, E, (2015). Socio-economic Convergence in the EU at National and Regional Level. *Procedia Economics and Finance*, vol. 23, pp. 1090-1095. ISSN 22125671. DOI 10.1016/S2212-5671(15)00333-0.
OTOIU, A., TITAN, E., (2015). Socio-economic Convergence in the EU at National and Regional Level. *Procedia Economics and Finance*, vol. 23, pp. 1090-1095. ISSN 22125671. DOI 10.1016/S2212-5671(15)00333-0.
ROKICKA, E., (2014). The Concept of 'Quality of Life' in the Context of Economic Performance and Social Progress. Springer. *International Publishing Switzerland*. DOI 10.1007/978-3-319-01481-4_2
TOMEŠ, I., (1996). *Sociální politika: teorie a mezinárodní zkušenost: výběr z přednášek přednesených na Filozofické fakultě Univerzity Karlovy.* Vyd. 1. Praha: Sociopress. ISBN 80-902260-0-0.
TULEJA, P., (2010). Praktická aplikace vybraných metod měření regionálních disparit. *Regionální disparity,* vol. 7 no. 7, pp. 5-23. ISSN n1802-9450
ZDRAŽIL, P., KRAFTOVÁ, I., (2012). Konvergují regiony zemí V4? *In XV. mezinárodní kolokvium o regionálních vědách. Sborník příspěvků. Brno: Masarykova univerzita*, pp. 48-58. ISBN 978-80-210-5875-

Attachments

Annex 1: Characteristics of baseline indicators

acronym	full designation	unit
characteristics according to Eurostat / resp. note		
RIPT	People at risk of poverty rate after social transfers	%
The share of persons with an equalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equalised disposable income after social transfers.		
MADE	Material deprivation rate	%
The indicator is defined as the percentage of population with an enforced lack of at least three out of nine material deprivation items in the 'economic strain and durables' dimension.		
DEMD	Depth of material deprivation	mean of the number of items
The indicator is defined as the unweighted mean of the number of items lacked by the materially-deprived population (at least three out of the nine items retained for the definition of the 'Material deprivation rate' indicator. Material deprivation covers indicators relating to economic strain and durables. Severely materially deprived persons have living conditions severely constrained by a lack of resources, they experience at least 4 out of 9 following deprivations items: cannot afford 1) to pay rent or utility bills, 2) keep home adequately warm, 3) face unexpected expenses, 4) eat meat, fish or a protein equivalent every second day, 5) a week holiday away from home, 6) a car, 7) a washing machine, 8) a colour TV, or 9) a telephone.		
INHO	Intentional homicide	per hundred thousand inhabitants
Supplementing values for the 2015 NL closest match NL2013 and doplnění value in England, Wales and Scotland, ie. UK 2015 levels in England 2014, Scotland 2014 and Wales 2014.		
ASSA	Assault	per hundred thousand inhabitants
Supplementing values for Scotland - UK 2015 closest match Scotland 2014.		
ROBB	Robbery	per hundred thousand inhabitants
Supplementing values for Scotland - UK 2015 closest match Scotland 2014.		
UADR	Unlawful acts involving controlled drugs or precursors	per hundred thousand inhabitants
Supplementing values for Scotland - UK 2015 closest match Scotland 2014.		
YOUN	Youth unemployment rate	%
The youth unemployment rate is the unemployment rate of people aged 15 - 24 as a percentage of the labour force of the same age. The unemployment rate is the number of unemployed persons as a percentage of the economically active population based on International Labour Office definition. Unemployed persons comprise persons aged 15 to 74 who fulfil all the three following conditions: are without work during the reference week; are available to start work within the next two weeks and have been actively seeking work in the past four weeks or have already found a job to start within the next three months.		
RIEP	Median relative income of elderly people (60+)	ratio of the median
The indicator is defined as the ratio of the median equalised disposable income of persons aged 60 and over to the median equalised disposable income of persons aged between 0 and 59.		