Where is delinquency nowadays? (Measuring the regional features of delinquency)

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The significance of regional aspects of criminality was already recognised in the early examinations of crime statistics. Also at the beginning of the 20th century the statistic data collection covered the place of commitment. The statistical process of these data restricted to the classification by counties. In the first part of the 20th century the task of law enforcement was relatively easy because the place of commitment and the criminal's domicile was the same settlement, the local policemen knew the potential criminals.
As a result of the development of motorisation crimes became more mobilised. By the end of the 20th century and the beginning of the 21st century not only the place of commitment and the domicile had got separated from each other but also the so-called moving crime occurred. In respect of crime prevention it means important information to show which settlements are the most endangered ones regarding crimes and which ones serve as the criminals' domiciles.
The system of indicators described in the study may provide help in the examination of the reasons for crimes because observation covers many factors that may be brought into connection with the crimes. I wish to illustrate the methods used to examine the regional features of crimes and the results through the data of a county (villages, towns, subregions).

Keywords: crime, crime prevention, crime-mapping

1. Introduction

As it is suggested by the subheading, in my lecture I want to deal with measuring the regional features of delinquency and - considering the venue of our conference - I am going to demonstrate the methods using the figures relating to Csongrád county. In the introduction I would like to give a short summary on why we deal with delinquency and how this negative mass phenomenon can be measured.

Why do we deal with delinquency? Nowadays we can hear a lot about delinquency. The newspapers, the radio and the television flood their readers, listeners and viewers with hair-raisers. Is the situation really as tragic as we are informed by the media? In the next few minutes I would like to present the objective reality as far as it is possible on the basis of scientifically grounded measurements.

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Basic terms. How to measure? Before projecting lot of numbers onto the screen I must explain how we can measure delinquency, this negative social mass phenomenon. We are aware of the fact that length can be measured in cm, m, area can be measured in square meters, hectares or acres. But what measure can be used for delinquency? The development of the present measuring methods was preceded by long professional debates but now these methods have been being used for several decades. Measuring is carried out using three equally important units of measurement:

- Number of publicly indicted crimes become known
- Number of perpetrators

These two measures and the figures measured by them are provided by the United Crimestatistics Database of the Police (Investigating Authority) and the Public Prosecutor's Office.

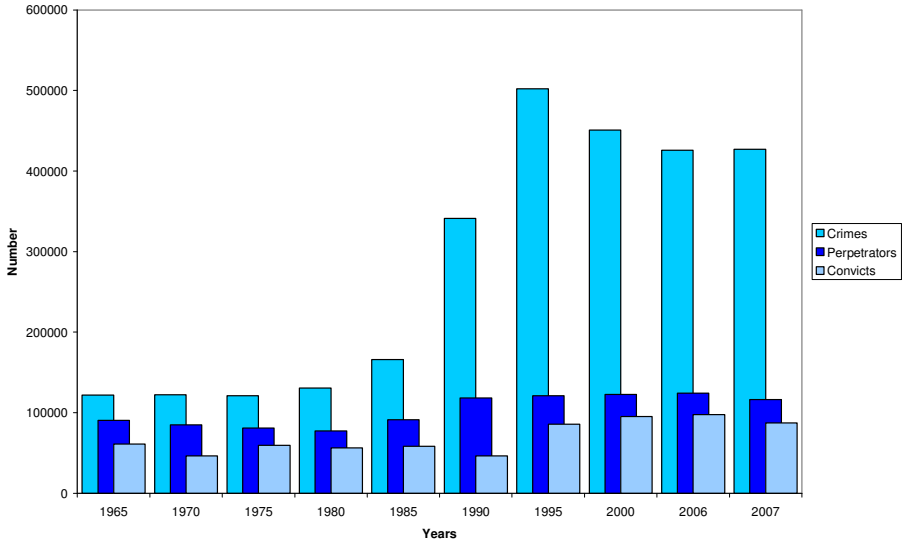
- The number of persons with definitive sentence

This latter one is the measure of the Judicial Statistics. Let me note that the former one was established in 1963, i.e. about 50 years ago and the latter one in 1880, i.e. about 130 yeas ago.

2. Time series and regional data

What does this long time sequence show? If we want to examine the delinquency in Csongrád county we have to start the examination from an earlier stage so that we can make comparisons. Let's have a look at a relatively long time sequence, from 1965 till today. It can be seen that the number of the committed crimes steadily fluctuated around one hundred and twenty thousand per year until 1980, the number of perpetrators and the persons with definitive sentence was approximately the same. It started to increase after 1980 and in 1990 it exceeded three hundred thousand and in 1995 it was more than five hundred thousand. It was at its peak in 1998 when the number of the publicly indicted crimes known exceeded even 600 thousand. It has been slowly decreasing since then and it has been fluctuating between 400 and 450 thousand during the past years. Thus we can say that - even if slowly - the criminal situation has been getting better since 1998. (Fig. 1.)

Figure 1. Number of crimes, perpetrators and persons with definitive sentence in Hungary, 1965-2007



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Measuring the regional features of delinquency. The significance of the territorial aspects of criminality was already realised in the early criminal statistical studies. As early as at the beginning of the 20th century the statistical data collection covered the place of commitment and after 1909 it recorded also the criminal's place of birth. Bud (1910) called these data and the indicators calculated from them criminal geography. He emphasized the importance of criminal geography in searching the causes of delinquency.

The statistical process of these data was restricted to the classification by counties and besides it the classification according to the type of the place of commitment was also considered (Budapest, towns, villages). This system of data collection was in use until the World War II and also the classification covered the counties and the characteristics of the places of commitment.

After World War II until the 60's the criminal statistics were secret. Afterwards and also today the judicial statistics process the data by counties. The classification according to the types of the place of commitment has been terminated because - due to the lots of changes in public administration - the data became incomparable. The number of towns and villages frequently varies and as such also the number of their population, thus comparison becomes pointless[0].

Year 1964 brought a new event in criminal statistics, ERÜBS (United Crimestatistics Database of the Police and the Public Prosecutor's Office) was introduced that year. The system observed the committed crimes including the place

of commitment and the criminals with their domiciles. Although the collected data ensured more varied possibilities for processing, ERÜBS made classifications only according to counties until lately also with regards to the place of commitment and the domicile.

In the second part of the 20th century the composition of criminals considerably changed regarding the connection between the place of commitment and the domicile. As a result of the development of motorisation crimes became more mobilised. By the end of the 20th century and the beginning of the 21st century not only the place of commitment and the domicile had got separated from each other but also the so-called moving crime had occurred, then it was rare to find that a criminal committed the crime at their place of residence. By opening the boarders the mobility of criminals crossing the boarders became widespread, especially in case of the most severe crimes.

From the above it follows that practically it was not possible to examine the regional features of delinquency earlier because the various statistics (police, public prosecutor's office, judicial) observed and processed the data of the region only up to county level. The improvement of methods in computer science made it possible to extend observation and recording also to the level of villages and towns. Since 2001 ENYÜBS (United Crimestatistics Database of the Crime Investigation Service and the Public Prosecutor's Office) has been collecting data up to the level of settlements making it possible to establish "criminal geography".

Examination of the regional factors today. Let's have a look if there is any difference between the delinquencies of the various counties? Here we have to face another problem of measuring, because if we compare the above mentioned measuring data we might easily come to misleading consequences because both the area and the number of population of the counties are different and it might influence the formation of delinquency. Therefore hereinafter we use the number of crimes (perpetrators, sentenced persons) fallen to one thousand (or ten thousand) inhabitants in our calculations. These indicators (called crude criminality rates) can be realistically compared in case of comparing counties with different numbers of population or in case of comparing the delinquency of towns and villages. You can see in the figure that the delinquency in Csongrád county is higher than the national average, it is the highest in comparison with all other counties in 2007 regarding the committed crimes.

If we perform the comparison on the basis of the number of perpetrators we receive a better picture, the county will be ranked on the 13th place, the rate is lower only in five counties. (Fig 2., 3., 4.)

Figure 1. Number of crimes and perpetrators per 10000 inhabitants in each county, 2007

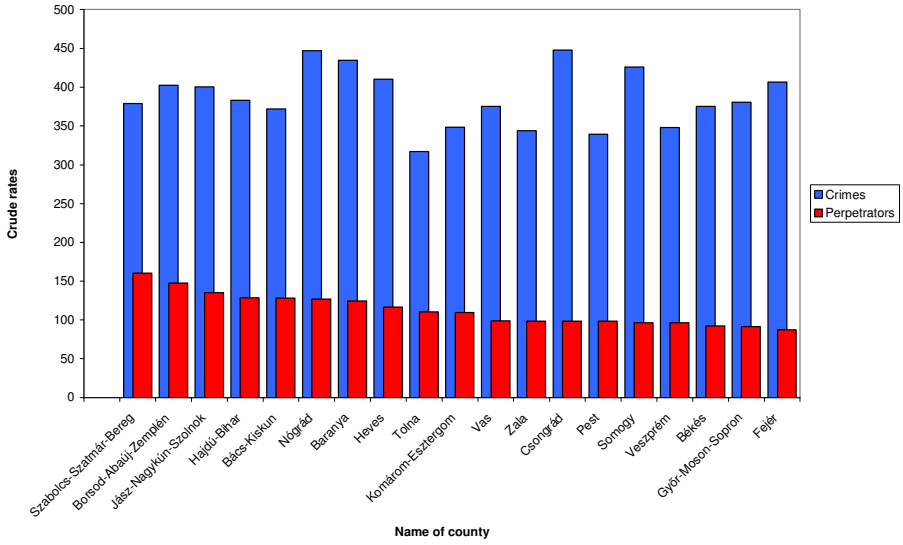

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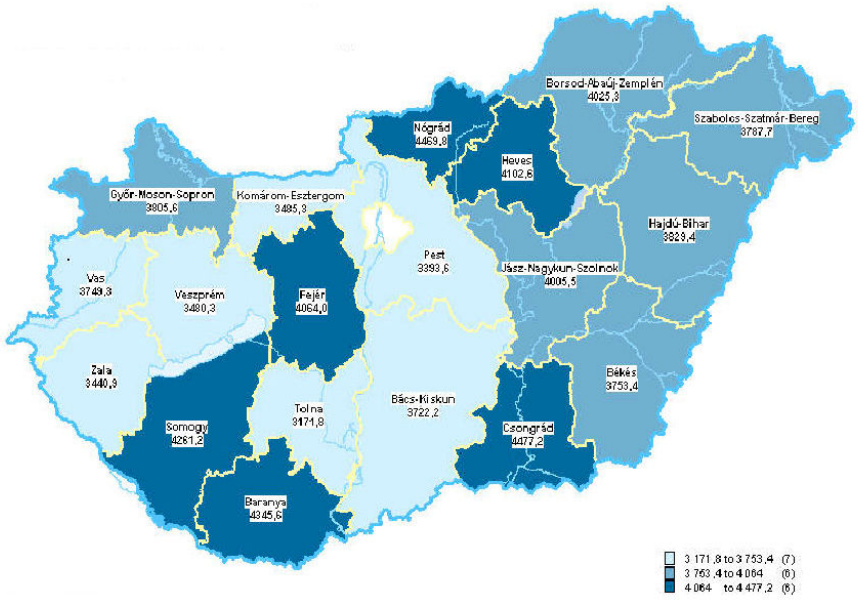
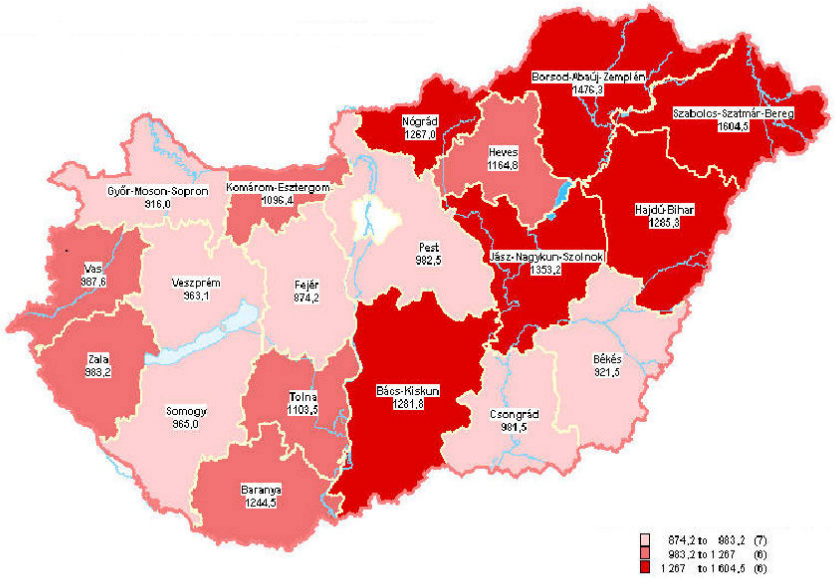
Figure 2. The frequency of publicly indicted, known crimes, in each county, 2007



Source: IRM BBFO

Figure 3. The frequency of known perpetrators, in each county, 2007



Source: IRM BPFO

3. Analysis of data of Csongrád county

The delinquency even within Csongrád county is not homogenous. Let's compare the delinquency in the subregions of the county. (Table 1.)

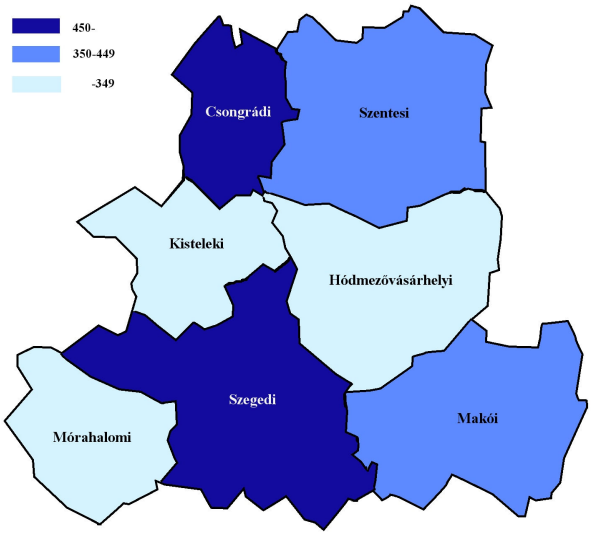
Table 1. Crude criminality rates and number of crimes committed by 100 perpetrators

Subregions	Perpetrators		Discovered crimes		Discovered crimes per 100 perpetrators	
	per 10000 inhabitants					
	2001	2007	2001	2007	2001	2007
Csongrádi	128,7	118,5	490,8	485,7	381,4	410,0
Hódmezővásárhelyi	110,5	110,1	242,9	329,3	219,8	299,2
Kisteleki	120,1	81,2	267,4	211,1	222,6	260,0
Makói	91,7	108,6	402,9	419,5	439,4	386,3
Mórahalomi	60,8	65,6	200,9	223,3	330,4	340,1
Szegedi	118,5	92,8	497,7	531,4	419,9	572,4
Szentesi	132,3	106,0	407,8	444,3	308,2	419,3
Average by counties	112,9	97,7	412,2	445,6	365,2	456,2

Source: own creation

The number of publicly indicted crimes become known and fallen to 10.000 inhabitants in the subregion of Csongrád, Szeged and Szentes is the highest in both observed years and the lowest in the subregions of Kistelek and Mórahalom. (Fig. 5.)

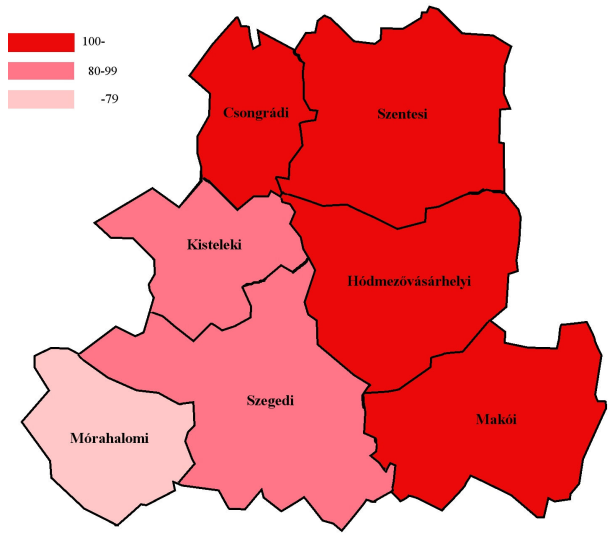
Figure 4. Number of publicly indicted crimes become known per 10000 inhabitants in subregions of Csongrád county, 2007



Source: own creation

The number of perpetrators per 10.000 inhabitants is the highest in the subregions of Csongrád and Szentes and the lowest in the subregions of Kistelek and Mórahalom. (Fig. 6.)

Figure 5. Number of known perpetrators per 10000 inhabitants in subregions of Csongrád county, 2007



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The significant numerical difference between the two types of indicators can be attributed to three factors:

- The perpetrator may commit more than one crime
- If the crime has become known it is not certain that the perpetrator who committed it has become known too
- In case of crimes the regional categorization is carried out in accordance with the place of commitment, in case of the perpetrator's place is the residence

The system of indicators applied during the research might be help in measuring the causes of delinquency because the observation includes many factors that can be connected to delinquency, as such, to the types of settlements, the demographic characteristics of the population living there, their education, employment relations, the rate of unemployment, the state of development of the settlement, tourism, financial situation, budget. Comparison with the categories of the types and the structures of settlements, and the size of population might also reveal important correlative conjunctions.

Below you can find the indicators calculated according to categories by the legal status of the settlements. (Table 2.)

Table 2. Crude criminality rates according to the legal status of the settlement, 2001, 2007

Legal status	Discovered publicly indicted crimes		Discovered perpetrators	
	per 10000 inhabitants			
	2001	2007	2001	2007
Towns of county rank	488,7	541,2	124,9	99,8
Other towns	448,5	430,2	123,2	109,0
Villages	233,4	277,2	80,5	83,2

Source: own creation

Delinquency has obvious connection with the legal status of the settlement, – regarding the committed crimes, – in both periods under examination the rate is the highest in the town of county rank, Szeged, and the lowest in the villages. However, the indicators are not as unambiguous in case of the perpetrators. The rate is not the highest in Szeged in 2007, which might indicate the success of law enforcement in Szeged or the fact that the number of perpetrators not living there has increased.

It seems that the Regional Clerk's Office has no influence on the tendency of delinquency, there is no significant difference between the delinquencies of the seat of the Regional Clerk's Office and other villages.

All indicators are the lowest on the settlements which attract few tourists, they are higher in the National Park and the highest on the settlements with medical tourism. This statement is in line with my examinations carried out in other counties (Veszprém, Nógrád, Heves, Borsod). (Table 3.)

Table 3. Crude criminality rates on the territory of the National Parks and on settlements with medical tourism, 2001, 2007

National Parks, medical tourism	Discovered publicly indicted crimes		Discovered perpetrators	
	per 10000 inhabitants			
	2001	2007	2001	2007
Körös-Maros National Park	387,0	405,7	99,5	115,9
Medical tourism	482,1	477,9	113,5	105,8
National Park & medical tourism	489,1	536,6	128,2	102,2
Neither National Park nor medical tourism	246,4	263,8	85,5	81,1

Source: own creation

If we make a classification according to the size of the population of the settlements at first sight the regularity cannot be noticed, the category of 500-999 inhabitants shows a very high value.(Table 4.)

Table 4. Crude criminality rates according to the size of the population of the settlements, 2001, 2007

Size of the population	Discovered publicly indicted crimes		Discovered perpetrators	
	per 10000 inhabitants			
	2001	2007	2001	2007
-499	162,3	188,8	103,9	97,9
500-999	751,9	738,7	81,4	79,7
1000-1999	180,8	182,0	90,4	81,4
2000-4999	211,0	269,9	81,5	83,6
5000-9999	232,4	214,7	87,1	83,8
10000-99999	417,4	449,5	124,7	116,4
100000-	555,8	595,8	128,4	96,1

Source: own creation

But if we examine which villages can be classified into this category we can see that the population of the border station, Nagylak, belongs to this group too. If we remove the data of Nagylak from the group then the rate of criminality increasing along with the number of population can be recognized. The rate of the group with a population of 2000-4999 persons is increased by the data of Röszke. There is no similar regularity in case of the perpetrators.

It is interesting to see that there is no connection either between the data relating to the crimes or the data of the perpetrators and the rate of the unemployed people. (Table 5.)

Table 5. Crude criminality rates according to the ratio of unemployment, 2001, 2007

Unemployed(%)	**Discovered publicly indicted crimes**		**Discovered perpetrators**	
	per 10000 inhabitants			
	2001	**2007**	**2001**	**2007**
3,0-3,9	512,8	556,5	119,8	93,8
4,0-4,9	396,7	390,4	120,6	102,4
5,0-5,9	291,4	335,2	98,6	100,1
6,0-6,9	530,0	458,4	111,3	97,2
7,0-7,9	167,1	272,7	107,9	108,0
8,0-9,9	233,1	312,9	86,2	80,7
10,0-	259,1	207,6	73,6	133,3

Source: own creation

Because the action data include the place of commitment and the personal data include the perpetrator's place of residence the detailed regional data show the perpetrators' mobility. With regard to crime prevention important information is provided by revealing which settlements are the most endangered in respect of crimes and which of them serve as places of residence for the perpetrators.

Now I will introduce the examination of the criminality of each settlement. (Fig. 7., 8.) In the figure Röszke has the highest rate, Nagylak could not be indicated because of the small size of the figure, its graph is eight times bigger than that of Röszke. Compared to the highest numbers of crimes the number of the perpetrators is much lower. In case of the settlements located in the central part of the diagram in

many cases the numbers of the crimes and that of the perpetrators is more or less the same. On some settlements next to the smallest blue columns the number of the perpetrators is higher than that of the crimes.(Kübekháza, Újszentiván)

Figure 6. Discovered publicly indicted crimes and their perpetrators in the settlements of Csongrád county, 2001

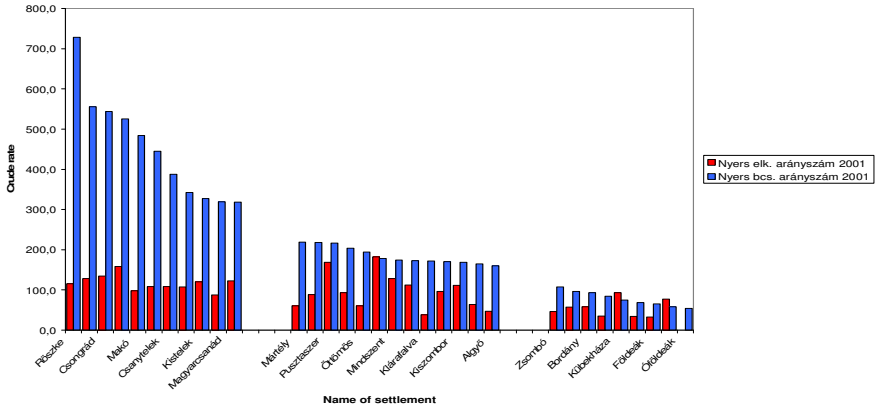

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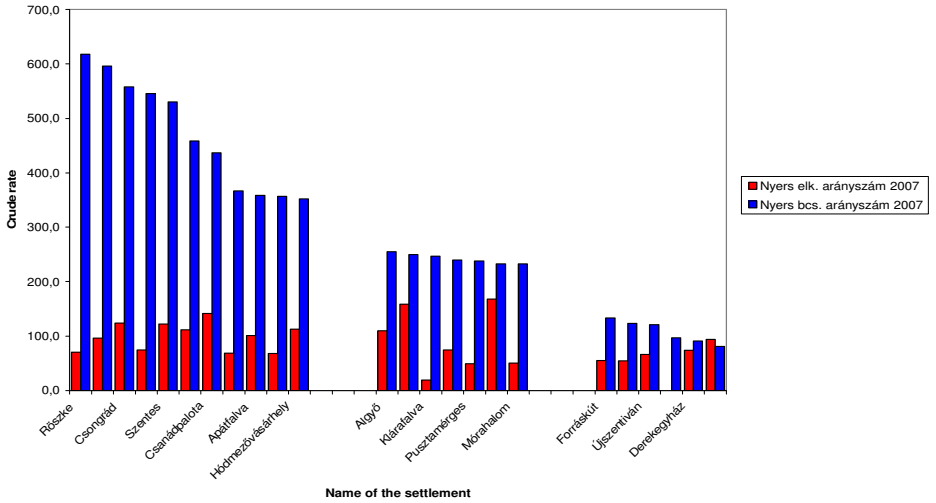
Figure 7. Discovered publicly indicted crimes and their perpetrators in the settlements of Csongrád county, 2007



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In 2007 it was Nagylak and Röszke, Szeged, Csongrád again which had the highest rates calculated from the crimes. The rates of the perpetrators are low in every place. It is only Kübekháza where the number of perpetrators is higher than that of the crimes.

Using the modern technology we can already prepare crime maps. Since we have sufficient information on the delinquency features of each settlement the map can provide information on their regional connections.

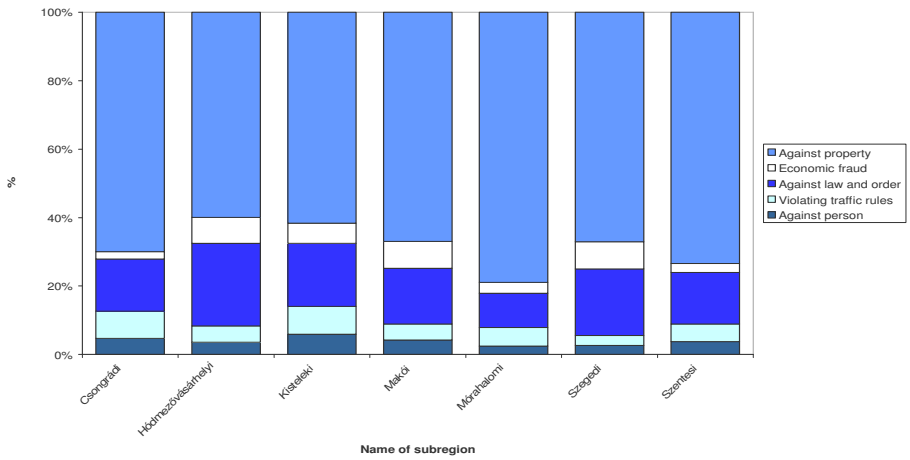
Distribution of types of crimes. The subregions are not identical considering the distribution of the crimes. The highest rate relates to crimes against property in all subregions and it has the highest rate in the subregions of Mórahalom and Szentes. It is followed by the rate of the crimes against law and order and it is the highest in the subregions of Hódmezővásárhely and Szeged, and the lowest in the subregion of Mórahalom. The ratio of crimes against people, the traffic and economic crimes is below 8% in all subregions. (Table 6., Fig. 9.)

Table 6. The distribution of crimes according to the main groups of the Penal Code 2007

Subregions	**Against person**	**Violating traffic rules**	**Against law and order**	**Economic fraud**	**Against property**
Csongrádi	4,6	7,7	15,0	2,1	68,5
Hódmezővásárhelyi	3,5	4,7	23,6	7,4	58,6
Kisteleki	5,7	7,9	17,9	5,7	59,8
Makói	4,1	4,5	15,6	7,6	64,2
Mórahalomi	2,4	5,3	9,7	3,1	76,9
Szegedi	2,6	2,8	19,1	7,7	65,7
Szentesi	3,6	5,1	14,8	2,6	72,1

Source: own creation

Fig. 8. The distribution of crimes according to the main groups of the Penal Code 2007



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4. Definition of the centre of delinquency

The objectives of the research include the determination of the centre of delinquency on both county and subregion levels. In prevention of crime it is important to answer such questions of organisation which are based on the determination of the regional centre of delinquency[0].

The centre point is an indicator produced by averages it eliminates the distorting influence of the accidental cases, and the dynamic examination of these indicators may be a very useful tool when analysing the regional distribution of delinquency.

The centre of delinquency can be defined following the analogy of centre of population applied in demography and the interpretation of this latter was made using the concept of the centre of gravity known as a model in physics. The precondition of generating this indicators is to set a coordinate system on the map of a specific area (governmental district, county or country) and to define the place of the settlements located on the area (villages, towns) using the coordinates of this coordinate system. Today the most practical space coordinates of the settlements can be the GPS coordinates serving for defining the places.

An important indicator of the regional distribution of delinquency is the centre of delinquency which is a point, the coordinates of which is the arithmetic average of the coordinates of each settlement (villages, towns) weighted by the number of the crimes committed on the specific settlement. In other words the two coordinates

of the centre, if t_i means the number of crimes committed on settlement No i., and n is the number of settlements:

$$x_s = \frac{x_1 t_1 + x_2 t_2 + \ldots + x_n t_n}{t_1 + t_2 + \ldots + t_n} = \frac{\sum_{i=1}^{n} x_i t_i}{\sum_{i=1}^{n} t_i},$$

$$y_s = \frac{y_1 t_1 + y_2 t_2 + \ldots + y_n t_n}{t_1 + t_2 + \ldots + t_n} = \frac{\sum_{i=1}^{n} y_i t_i}{\sum_{i=1}^{n} t_i}$$

5. Conclusions

To sum it up, the research is very timely, it is of stopgap character, its realization is possible with the new technical facilities, partly using the methods of accessing the necessary data, partly by using the methods provided by the information technology. In addition to the theoretical significance of the research it serves success in the field of both law enforcement and prevention of crimes.

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