

**Zsuzsa Piskóti-Kovács Ph.D.**

research associate, Eszterházy Károly University – Innoregion Knowledge Centre

piskoti.zsuzsa@uni-eszterhazy.hu

**Milán Kovács**

group-leading prosecutor, District Prosecution Office Eger

kovacs.milan@mku.hu

**NEW METHOD TO MEASURE CRIME: SHIFTING THE FOCUS  
FROM SIMPLE COUNTING TO WEIGHTING****Abstract**

To evaluate the public safety of a certain spatial area, indicators of criminal situation and the investigation performance indicators are applied, which provide information about the work of the law enforcement authorities. The criminal situation is described by the number of known crimes, number of high-profile crimes, known crimes committed in public space and crime rate per 100 000 residents. However, it leads to several research questions: do the amount of crimes reflect properly the public safety? Does the current crime statistics provide an appropriate basis for the police for decision-making? Do all types of offences have the same effect on society? The Article focuses on a new trend of assessing criminality: it demonstrates the concept of crime harm indexes. In addition, it provides an overview about the existing ones. The Article could be interpreted as the first steps in the creation of Hungarian Crime Harm Index (HU-CHI).

**Keywords:** crime harm index, crime statistics, HU-CHI, methodology

**1. Introduction**

Police reports apply different indicators of crime and the investigation performance index to evaluate the public safety of a certain spatial area. The main research question is whether these indicators reflect properly the situation of public safety? Does the investigation performance index evaluate the work of law enforcement agencies correctly? Do all crime types have the same effect on society?

The Article provides information about the traditional measurement of public safety in Hungary and points out the problems. Thereafter it demonstrates the methods for estimating crime harm and introduces the concept of Crime Harm Index (CHI). A comparison of CHI methodologies will be carried out in order to find the best fitting one to Hungarian circumstances. The Article could be interpreted as the first step in the creation of Hungarian Crime Harm Index (HU-CHI).

## 2. The ‘traditional’ measurement of public safety according to police reports

To evaluate the public safety, the following crime indicators are applied in reports:

1. number of known crimes,
2. crime rate per 100 000 residents,
3. number of high-profile crimes,
4. number of crimes committed in public area,
5. crime investigation index for all crimes, for high-profile crimes and for crimes committed in public space.

While the first four provide information about the criminal situation of a certain area, the last one is for evaluating the efficiency of law enforcement authorities.

The *number of known crimes* involves all offences which are known for law enforcement authorities. *Crime rate per 100 000 residents* is applied for the sake of spatial comparisons. Change in the number of offences could be due to the change in criminal law, population, trust in authorities, etc. (VAVRÓ 1996). In addition, the presence of latent crime has to be taken into account during the analysis of crime statistics: according to KORINEK (1996) these are the crimes that are unknown, unreported for law enforcement agencies. There are several initiatives around the world that attempts to estimate the real volume of crime. The different crime victim surveys could provide a good example, for instance International Victim Survey or British Crime Survey. SKOGAN (1975, 2003) deals extensively with the reliability of crime data and his results lets us to be optimist. This statement is supported by HARRIES (2003) who found a connection between British Crime Survey data and known crimes. Besides the crime victim surveys there are questionnaire surveys which target the analysis of subjective safety feelings of residents and the extent of latency (for instance: PISKÓTI 2012; MÁTYÁS 2015; MÁTYÁS – CSEGE 2019; PÖDÖR 2020). The reports involve the *number of high-profile crimes and crimes committed in public areas* as well, because these have a particular impact for the safety feelings of residents.

In the police reports the *investigation performance indicator* is applied for assessing the work of the law enforcement authorities. VÁRI (2014) demonstrates the creation methods of investigation performance indexes in details and describes its general formula:

$$\text{Investigation performance} = \frac{\text{successful investigations}}{\text{successful investigations} + \text{unsuccessful investigations}} \times 100$$

VÁRI (2014) establishes that the investigation performance provides a view about the work of the law enforcement authorities, but these indexes – in spite of the crime statistics – are not specific, consequently the performance indicators of certain authorities are not comparable to each other. This is because these indicators do not represent the certain regulatory conditions, workload, ability, otherwise do not involve information about capacity.

The international literature pays attention to the problem of counting crimes as if they were created equal. SHERMAN ET AL. (2016) suggest an alternative method by integrating all crimes in a weighted index, which represents a far more useful approach for resource allocation and crime prevention. They state that the essential principle of a meaningful measure of crime is to classify each crime type according to its harmfulness, relating to all other crimes (SHERMAN ET AL. 2016). SHERMAN ET AL. (2016) summarized the 6 main problems of weighing crimes equally (Table 1).

**Table 1. Problems of counting police-recorded criminal events as if they were equal according to SHERMAN ET AL. (2016, 6.)**

1.	There is no meaningful, “bottom line” indicator of whether public safety is higher or lower in any year, place, offender’s record, or agency caseload.
2.	High volume, low seriousness crimes are disproportionately influential in driving crime counts up or down.
3.	Total counts of crimes, as distinct from crimes reported solely by individual victims and witnesses, include crimes detected solely or mostly by proactive police or corporate enforcement, which can be driven up or down by state action rather than by the behavior of criminals.
4.	If there are budget cuts it often leads to reducing investments in proactive enforcement, which can indicate a decrease in crime counts, however crime harm may rise.

5.	The management of offenders may be distorted by the tendency of prolific offenders to have relatively modest levels of seriousness, while very serious offenders may have very few convictions.
6.	Police face identical problems with counts in comparing areas at same point in time, or changes over time within areas.

SHERMAN ET AL. (2020) demonstrate extensively the problems of recent crime statistics and recommend an alternative way. They provide seven ‘statistical series’<sup>4</sup> for counting crime in a more useful way. The advantage of these statistical series is that they are based on existing systems of data collection and reporting, consequently they are inexpensive to create and report. One of them is the crime harm index, which will be detailed in the next chapter.

### 3. Methods for estimating crime harm

According to international literature there is an increasing interest on assessing harm in the last few years, SHERMAN ET AL. (2016) find three main reasons in the background: firstly, the growing demand for analyzing and understanding the harm caused to victims, secondly, after the economic crisis of 2008 the fiscal austerities and criminal justice budget cuts forced police to reassess their focus on traditional crimes and crime counts. Finally, the third reason is that there is renewed emphasis on the importance of harm reduction as an objective of law enforcement.

Before providing information about the estimation of harm and the concept, it is essential to demonstrate the definition of harm. According to SPROAT (2014) it can be established that *harm* and *harm reduction* is poorly defined in the field of policing, which led to different interpretations and competing methods of measurements. According to RATCLIFFE (2015) ‘harm is an amorphous term that is easily understood in the abstract but vague in a policy context’ (RATCLIFFE 2015, 3.). CURTIS-HAM – WALTON (2017) uses the term of harm in a broad-view, which includes the various negative physical, psychological, social and economic impacts caused by crime as a whole and a specific crime relative to each other.

Generally, ‘harm can be defined as the negative consequence deriving from an adverse event in a broad sense’ (TUSIKOV AND FAHLMAN, 2009, 157.). Harms caused by crime can be merged in different forms. ASHBY (2017) highlights its complexity: it could cause financial costs, emotional harm, environmental and social harm. Due to the different forms of harm it is a

<sup>4</sup> Article of SHERMAN ET AL. (2020) provides detailed description of the statistical series.

challenge to identify the real harm, which leads to the problematic estimation of it (ASHBY 2017).

Regarding harm it is worth mentioning the *seriousness* of crime. According to ROSSI ET AL. (1974) ‘the seriousness of criminal acts represents a conceptual dimension of criminality indispensable in every discourse, in legal theory and practice, and in sociological work. The seriousness of a criminal act may be viewed as a normative evaluation, an overall judgement, which allows comparisons among criminal acts, cultural values in different societies and cultures, and individual value differences’ (ROSSI ET AL. 1974, 224.). SHERMAN ET AL. (2016) treat harm as a synonym of seriousness.

The demand of estimating crime harm using a common metric merged in the 60’s, also there is a long tradition of harm measurement. RACTLIFFE (2014) distinguishes three basic methods: the *crime seriousness indexes*; *cost of crime estimates* and the *crime harm indexes*. BARNHAM (2018) uses the same classification, he divides the methods into the following categories: *public opinion*, *cost* and *sentencing in court*. He found the third method the most promising, because it is democratic and reliable.

The first *crime seriousness index* was the *Sellin-Wolfgang index*. It involved 3 components and each elements of components had a score, which expressed the seriousness of certain character of the offence (Table 2). The score for a criminal event was the sum of the component scores for each victim of crime. The crime index for the nation was simply the sum of those seriousness scores for these individual crime events (BLUMSTEIN 1974).

**Table 2. Sellin-Wolfgang Seriousness Components and Scores (source: BLUMSTEIN 1974, 855.)**

Components	Score
<b>Injury Component</b>	
<i>Victim assaulted</i>	
Minor injury	1
Treated and discharged	4
Hospitalized	7
Killed	26
<b>Intimidation Component</b>	
<i>For each forcible sex offence</i>	
The sex offence	10

Intimidation by weapon	2
<i>For non-sex offense</i>	
Physical or verbal intimidation	2
Weapon intimidation	4
<b>Property Component</b>	
Premises forcibly entered	1
Stolen vehicle	2
<i>Value of property stolen</i>	
Under \$ 10	1
\$ 10-\$ 250	2
\$ 251- \$ 2 000	3
\$ 2 001- \$ 9 000	4
\$ 9 001- \$ 30 000	5
\$ 30 001- \$ 80 000	6
Over \$ 80 000	7

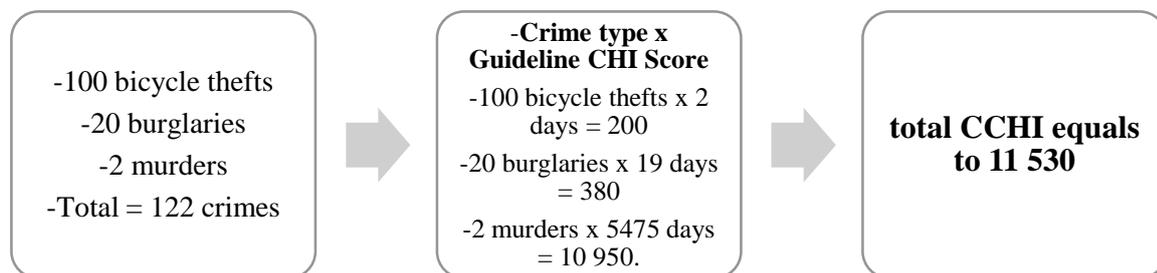
RACTLIFFE (2014) states that this approach was briefly popular due to two reasons: on the one hand there were methodological problems regarding the survey on which the determination of weighting was based (MALTZ 1975), on the other hand because of the difficulty of distinguishing generic harms from individual victimizations (COHEN ET AL. 1994). One of the biggest problems relating to an index using weights that are based on public opinion is the fact that these kinds of surveys could be very expensive, and according to BARNHAM (2018) changes in public opinion would make long-term comparisons unstable (SHERMAN ET AL. 2014).

An alternative approach has emerged focusing on *the cost of various offences*. Cost of crime estimates involve two aspects: they try to express that which crimes mean greater cost to the society and they also examine the effectiveness of prevention programs from an economic perspective. RACTLIFFE (2014) summarizes four main challenges with operationalizing these measures: firstly, due to the inflation the calculations have to be reviewed by year to year, secondly, 'the monetary costs to society mean little to the police as they do not recoup the cost of any crime reduction directly'. The third thing is that many significantly harmful crimes have low volume and do not have easily calculable costs, finally 'cost of crime generally calculated

for sweeping categories (such as robbery or homicide) and are limited by not being able to distinguish between types of crimes within these large categories' (RACTLIFFE 2014, 166.). WICKRAMASEKERA ET AL. (2015) reviewed the literature focusing on the estimation of the cost of crime and they concluded that these estimations are not effective.

In the last few years, several studies have emerged which have focused on *crime harm indexes (CHI)*. But what is CHI? To create a crime harm index, 'crimes are integrated into a weighted index, based on how much harm the different offences cause. Technically, a *CHI is a score derived from the application of a metric, which weights different offences based on a proxy measure of the harm it causes, relative to other crimes*' (KÄRRHOLM – NEYROUD – SMAALAND 2020, 16.). From the usefulness of CHI, it is essential to comprehend that a small minority of all crimes cause a great portion of the total harm (KÄRRHOLM – NEYROUD – SMAALAND 2020). SHERMAN (2007) calls this phenomenon as the *power few*.

SHERMAN ET AL. (2020) provide an example and detailed description about how to calculate a crime harm index. These data represent the crime data of a hypothetical village, which suffered the following count of by category during a year (Figure 1).



**Figure 1. Sample calculation of CHI according to SHERMAN ET AL. 2020.**

In case of Cambridge Crime Harm Index (CCHI), the weights are derived from the Sentencing Council of England & Wales "starting point" guidelines. Consequently, the CHI can be calculated by multiplying the number in each category by the days of imprisonment. According to the calculation, total CCHI equals to 11 530.

SHERMAN ET AL. (2016) summarized three basic criteria toward CHIs. These criteria are interpreted as questions by MITCHELL (2019, 105.):

1. *Democracy test*: does the metric reflect the resolution of conflicting viewpoints by a process adopted by a democratic government reflecting the will of the people?

2. *Reliability test*: Does the metric provide reliable measure that can be consistently applied to each unit of analysis – time, place, people – with the same results for the same levels of harm?
3. *Cost test*: Is the metric readily available at virtually no cost to be adopted without any new budgetary appropriation?

CURTIS-HAM – WALTON (2017) completed these three criteria with two following implicit, but related ones:

4. *Validity*: The metric needs to measure harm simply and objectively, the harm value must be associated solely with the offence type, without adjustment for prior criminal history, other offender attributes or the circumstances of the particular offence.
5. *Easily operationalized*: the index must be simple, not too complex. For the creation a minimal instruction or training is expected.

If any CHI does not pass these three tests, a standard metric will most likely not be adopted in policing (MITCHELL 2019).

#### 4. Methodologies in the literature

MITCHELL (2019) states that ‘harm indexes lack a broad sense of research, as it is a relatively new approach evaluating policing interventions’ (MITCHELL 2019, 104.). The main aim of this chapter to provide an overview of the existing crime harm indexes. Studying the international literature, seven crime harm indexes have been developed until today (Table 3.). To create the HU-CHI, it is worth to know that which methodologies are applied in the existing ones. This is the reason why the Authors focuses on the methodology and the source document of weights.

**Table 3. Developed Crime Harm Indexes according to the literature**

Name	Source Document of the weight	Methodology
<b>California Crime Harm Index (CA-CHI)</b> (MITCHELL 2019)	<u>Sentencing statutes derived from the Californian Penal Code</u>	First, they count up the number of crimes of each type, then they multiplied it with the maximum number of prison days recommended for crimes of that type by first offenders. It is calculated in all crime types, then they summed it up to yield the total crime harm (MITCHELL 2019)
<b>Cambridge Crime Harm Index</b>	<u>English-Welsh sentencing guidelines</u>	The number of years or days imprisonment is converted into a total number of days.

<p><i>(Cambridge CHI - CCHI)</i></p> <p>(SHERMAN – NEYROUD – NEYROUD 2016)</p>		<p>They applied the lowest starting point guideline for each offence.</p> <p>In case of offences, where the minimum tariff is a period of days or hours Community service, the days/hours have been converted into number of days.</p> <p>Where the starting point is financial penalty, they calculated the weighting by assessing the number of hours/days it would take to earn the money to pay the fine while working for the minimum wage for an adult. (SHERMAN – NEYROUD – NEYROUD 2016)</p>
<p><b>Danish Crime Harm Index</b></p> <p><b>(DCHI)</b></p> <p>(ANDERSEN – MUELLER-JOHNSON 2018)</p>	<p><u>Prosecutor Guidelines</u></p>	<p>The analysis coded the recommended number of days in prison for each offense type based on guidelines set out by the Danish Office of Public Prosecutions. The sentencing value from the prosecutor guidelines was reviewed by five prosecutors. (ANDERSEN – MUELLER-JOHNSON 2018).</p>
<p><b>New Zealand Crime Harm Index</b></p> <p><b>(NZ CHI)</b></p> <p>(CURTIS-HAM – WALTON 2017)</p>	<p>Actual sentences delivered by the <u>Courts</u></p>	<p>The NZ CHI uses an alternative approach to existing CHIs developed overseas, by estimating the minimum sentence for a first-time offender using actual sentencing data. The data set is provided by the Ministry of Justice containing the outcomes of charges for the period 2004-15 inclusive.</p> <p>Relevant outcomes and sentences are translated into Equivalent Prison Days; for the used transformation formula see CURTIS-HAM – WALTON 2017; 6.</p>
<p><b>Queensland Crime Harm Index</b></p> <p>(RANSLEY ET AL. 2018)</p>	<p>Community and police officers <u>survey</u></p>	<p>The index based on community and police officer surveys of perceptions of crime harm.</p> <p>(RANSLEY ET AL. 2018)</p>
<p><b>Swedish Crime Harm Index</b></p>	<p><u>Sentencing statistics</u> published by The Swedish National Council for Crime Prevention</p>	<p>They applied 5 alternative methods to develop the CHI: the weight could be based on expert estimates; sentencing data; penal code maximum, minimum or average. They compared the 5 alternatives, in addition tested the 5 criteria showed above, and concluded that the average prison</p>

(KÄRRNHOLM – NEYROUD – SMAALAND 2020)		sentence was the best one. Data derived from sentencing statistics.  (KÄRRNHOLM – NEYROUD – SMAALAND 2020)
<b>Western Australian Crime Harm Index (WACHI)</b>  (HOUSE – NEYROUD 2018)	<u>Criminal court and traffic court cases</u> captured by the WA Department of Justice	They studied four possible methods for deriving relative harm values for each offence category: sentencing guidelines, maximum sentences, actual sentences and first offender sentences. Finally, the WACHI based on the median number for each offence category. (HOUSE – NEYROUD 2018)

According to the international literature, the development of CHI could be based on several methodologies. However, there is an emerging academic consensus suggesting that the preferable method to develop a CHI is using the law and sentencing outcomes. The main reason behind this is that these sources are subordinated to the criteria of the rule of law and therefore they are considered to produce a compromise of conflicting viewpoints of how to assess harm, expressed through law (KÄRRHOLM ET AL. 2020).

What makes it difficult to create a system for Hungary is the fact that *no sentencing guidelines are available* for the legal practitioners and in addition, there are legal obstacles for obtaining court sentences in individual cases. There are some types of case law which are published but these court decisions are primarily focusing on legal questions and less information are available for assessing the judge's concept regarding the form and amount of the penalty given to the accused person. We believe that the cornerstone of the HU-CHI should be the rules of the Criminal Code, in particular the rule of imposing median penalty (Section 81 paragraph 2).

## 5. Summary

One of the main aims of the recent Article was to provide an overview about the literature of Crime Harm Indexes. The goal of the Authors was to demonstrate the different methodologies existing worldwide and to show the basic criteria for creating such an index. The Article could be considered as a prelude of the construction of the Hungarian Crime Harm Index (HU-CHI). The application of CHI has several benefits: according to SHERMAN ET AL. (2016) it 'would provide far greater clarity for evidence-based policies, ensuring a standard 'currency' for cost-effectiveness comparisons of alternative strategies of targeting, testing, and tracking resource allocation by police, law enforcement agencies and wide range of government policies (SHERMAN ET AL. 2016, 8). 'CHI values can more meaningfully measure national trends in public safety year-on-year, annual comparisons in safety and performance' (SHERMAN ET AL.

2016, 9.). BARNHAM (2018) supports this idea, he states that the application of CHI could result more effective targeting of police resources and help in portraying the nature of crime in the community.

The Authors believe, that the above-mentioned benefits could be achieved in Hungary as well and the HU-CHI could be a useful additional “tool” for the police and decision-makers. The Authors strongly agree with BARNHAM (2018), that ‘the use of crime harm index should not replace traditional counts of crime but complement them in order to give a rich picture of crime’ (BARNHAM 2018, 17.). It could be applied in several fields of law enforcement: for instance, it could make the police work more efficient by allocating their dwindling resources to the most harmful areas, or it could be involved into the evaluation of police departments. Moreover, it could provide information about the public safety feelings of residents. It is obvious that it is impossible to find a perfect index which reflects all harm of crime, but according to the international literature we are going to create it taking into account the available crime data sets and legal environment in Hungary.

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