BY-NC-ND

ISSN 2029-2236 (print)
ISSN 2029-2244 (online)
SOCIALINIŲ MOKSLŲ STUDIJOS
SOCIETAL STUDIES
2016, 8(1), p. 18–43.

MEASURING THE IMMEASURABLE: MODELS OF INTEGRATION OF RECORDED CRIME AND VICTIM SURVEY DATA

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Received 20 November, 2016; accepted 30 November, 2016

DOI:10.13165/SMS-16-8-1-2

Abstract. *There is a great need to measure the differences of crime rates over time and space. However, it is obvious that the actual crime rate can never be accurately measured. Inexact measuring methods need to be used or crime could be left unmeasured. This article examines the possibilities of complex use of recorded crime and victimisation survey data in order to better assess crime rate differences over time and space within the same country. The article explores the main aspects and problems of comparison of recorded crime and crime victim survey data, provides new models of recorded crime and crime victim survey data integration, compares these models with each other, presents findings on the most suitable model for assessing crime rate and applies this model in practice. A new indicator of crime rate (RAS) is developed based on integration of recorded crime and victim survey data, suitable for assessing crime rate differences over time and space within the same country.*

Keywords: *crime, recorded, victimisation, survey, indicator.*

Introduction

Crime is one of the most important objects of criminological cognition. It is important to know what the crime rate is, how it is changing, and what the crime structure is. It is important to know all of these aspects when assessing the costs of crime, considering the resources to be devoted for crime prevention, when choosing a target of crime

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ISSN 2029-2236 (print) ISSN 2029-2244 (online)
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http://www.mruni.eu/en/mokslo_darbai/SMS/

prevention (a particular type of crime), when looking for suitable crime prevention methods and whenever we need to determine the impact on crime. However, until today criminologists have no tool or method that can accurately measure crime. Sometimes they even cannot tell whether crime rate is rising or falling. For example, this concerns situations when the recorded (official, police) crime statistics shows an increase in the level of crime, but crime victim survey data shows a decrease.

Criminologists understand that it is impossible to accurately calculate the number of crimes committed in a given area over a specific period of time. All methods of calculation are imprecise. However, practitioners and politicians have little interest in what criminologists say: crime is a social construct; it is not possible to measure the true volume of crime or to say that actual crime rate is rising or falling. Practitioners and politicians are reluctant to pay money for such information. They want answers to typical questions: what is the extent of crime rate, how it is changing, what is the impact of applied prevention measures on crime, etc. Without measuring crime, criminologists cannot at least approximately assess crime and its changes, nor can they answer these questions. Such criminologists are unnecessary for practitioners, politicians and the public.

In some countries, crime analysis and assessments are based on recorded crime (police) statistics. However, these data cannot accurately reflect the picture of actual crime. According to various investigations and evaluations, the rate of some types of crime calculated on the basis of victimisation polls is several or even dozens of times higher than the corresponding rate of recorded crime (Aebi et al., 2002; Aebi et al., 2009; Ansari, 2013; Bezlov et al., 2005; Bijleveld & Smit, 2005; Gruszczynska & Gruszczynski, 2005; Justickis et al., 2012; Van Dijk, 2008a). It seems that crime victim survey data are a more reliable source of crime data. However, crime victim survey data are not actual crime data. Crime victim survey data reflect the individual perception of crime. Respondents are not lawyers, they cannot legally assess all the relevant circumstances, and those circumstances are not investigated. After investigation some events would not be qualified as crimes. Respondents tend to attribute previous incidents to the reference period (a phenomenon known as "telescoping"). Respondents do not remember all the details, etc.

The advantages and limitations of these two main sources of crime are well-known. Specialists agree that the conclusions on crime based on a single source of information are unreliable (Aebi et al., 2009).

In some countries (USA and others), crime analysis and assessments are based on two main sources of information – recorded crime statistics and periodic crime victim surveys. These two sources of information show different aspects of the same object (crime) like two sides of the same coin, and they complement each other. Crime recording and crime victim survey can be compared to two rays (hereinafter 2R), illuminating different sides of the crime, showing its different aspects. Both rays often show substantially different pictures of crime, but it is not clear how to combine and integrate those two rays (two types of data) and to obtain a more reliable picture of crime.

Novelty. Many scientists have explored various aspects of comparison and common use of recorded crime statistics and victimisation survey data (Aebi et al., 2002; Aebi et al., 2009; Aebi & Linde, 2010; Andersson, 2004; Ansari, 2013; Averdijk & Elffers, 2012;

Bezlov et al., 2005; Biderman et al., 1991; Bijleveld & Smit, 2005; Blumstein et al., 1992; Booth et al., 1977; Cantor & Lynch, 2000; Catalano, 2006; Cohen & Land, 1984; Decker, 1977; Dodge, 1981; Eck & Riccio, 1979; Farrington & Langan, 1992; Flatley et al., 2010; Gruszczynska & Gruszczynski, 2005; Hipp, 2013; Hough & Maxfield, 2007; Lehnen & Skogan, 1981; Lynch, 2006; Lynch & Addington, 2006; Menard, 1987; Menard & Covey, 1988; Messner, 1984; Mosher et al., 2011; Murphy & Dodge, 1981; O'Brien, 1990; Piquero et al., 2002; Posselt, 2005; Rand & Renninson, 2002; Skogan, 1975; Smit & Van Dijk, 2014; Tourangeau & McNeeley, 2003; Van Dijk, 2008a, 2008b, 2015). Several models were created which combined these two sources of information in order to compare the crime rate between *different countries* at the international perspective (Gruszczynska & Gruszczynski, 2005; Van Dijk et al., 1998; Van Dijk, 2008a). These models need a lot of different data, which is difficult to get all. There is a great need to create a relatively *simple* indicator which would bring together these two sources in order to compare crime rate in space and time namely within the territory of *the same single state*. It is important to answer questions about crime in one single state using both sources together: (1) whether the crime rate has raised, fell or stayed about the same; (2) in which areas of the state the crime rate is higher or lower, etc.

The *aim* of this article is to assess the possibilities of complex use of recorded crime statistics and victimisation survey data (two rays), to create a model of their integration based on single state information and to propose a new indicator of crime rate suitable for assessing crime rate differences over time and space within the same state.

The *object* of investigation is the methodology of comparison and complex use of recorded crime statistics and victimisation survey data. The analysis, synthesis, comparison, modeling, statistical and other *methods* are used.

1. The problems of two-ray comparison

The question arises to what extent recorded crime (police) statistics and victimisation survey data are comparable. Since the book by Biderman et al.[1], it is common sense in criminology that direct comparison between these two data sources is hardly feasible without considering a series of precautions[2]. We can identify the following *main problems of 2R comparison* (Aebi et al., 2002; Aebi et al., 2009; Andersson, 2004; Averdijk & Elffers, 2012; Bezlov et al., 2005; Biderman et al., 1991; Bijleveld & Smit, 2005; Flatley et al., 2010; Gruszczynska & Gruszczynski, 2005; Posselt, 2005; Tourangeau & McNeeley, 2003; Van Dijk, 2008a):

- *Some types of crime cannot be used in victimisation surveys.* For example, this concerns homicides, some of the financial, economic crimes and others. Such crimes have no direct victims, crime victims are not alive or direct damage incurred by the State.

1 Biderman, A. D., Lynch, J. P., & Peterson, J. L. Understanding Crime Incidence Statistic: Why the UCR Diverges from the NCS. New York: Springer. 1991. http://doi.org/10.1007/978-1-4612-2986-5. [accessed 09.10.2016]

2 Aebi, M. F., Robert, P., Hough, M., Killias, M., & Van Dijk, J. Comparing Crime Data in Europe: Official Crime Statistics and Survey Based Data. Brussels: VUB University Press. 2009.

- *Discrepancies in defining crimes and changes in definitions*. Victimisation survey questionnaires do not always use the same definitions as used in the police statistics.
- *Territorial discrepancies*. Police statistics are locally limited and include only those crimes that fall into a well-defined territory, but victim surveys sometimes include[3] crimes outside that territory. At the same time, police statistics include people who may not form the object of victimisation surveys because they live outside that territory (for example, tourists).
- *Research period discrepancies*. If victimisation survey period fails to cover a calendar year, it is often difficult or even impossible to obtain recorded crime statistics of the corresponding period.
- *Non-standardised research methodology and irregularity of victimisation surveys*.
- *Different categories of victims*. Police data includes crimes committed against natural and legal persons, but victim surveys usually concern crimes only against natural persons. In addition, persons under a certain age also fall outside the victimisation surveys.
- *2R are different in nature*. The number of recorded crimes and the number of crimes reported by people during victimisation surveys represents different aspects of crime. Victimisation survey data reflect the respondents' (mostly not lawyers) experience and their understanding of events. The number of recorded crimes is obtained by qualified lawyers after assessing legally significant circumstances.

These problems limit the use of such comparisons. Some of these problems can be solved. However, there is a widespread opinion among criminologists that these two sources of information entail distinct errors and that direct comparison of their data leads to the risk of multiplication of such errors[4]. However, criminology will always have to navigate between using data whose validity might remain questionable in some respects, and using no data at all[5].

The two ray data (despite many problems) are compared with each other in different countries, by drawing conclusions from it and assessing crime. For example, the international comparison[6] of victimisation survey data and recorded crime statistics was performed in 2007. This comparison concerned only the European countries. A weak correlation was found between police statistics and the international victimisation survey data. In the countries where series of victimisation surveys were performed, statistical trends were analysed and very little correlation between these two data was also found.

Reviewing the available data, Cook and Khmilevska[7]observed that recorded data and survey results exhibited very different growth rates. In the USA, long-term sur-

3 Depending on the survey purpose and the questions formulated in the questionnaire.

4 Aebi, M. F., et al , *supra note 2*.

5 Aebi, M. F., Killias, M., & Tavares, C. Comparing crime rates: the international crime (victim) survey, the european sourcebook of crime and criminal justice statistics, and interpol statistics. International Journal of Comparative Criminology, 2002, 2(1), pp.22–37.

6 Aebi, M. F., et al , *supra note 2*.

7 Cook, P., & Khmilevska, N. Cross-national patterns in crime rates. Crime and Justice, 2005, 33(2005), pp. 331–345. http://www.jstor.org/stable/10.2307/3488339. [accessed 09.10.2016]

vey-based rates and police figures tend to be more in agreement than medium-term trends[8]. Ansari[9] study showed the progressive convergence of crime rates obtained from recorded crime statistics (UCR) and victimisation survey data (NCVS) in the United States over the past 2 decades.

2. Research methodology: Models of two-ray integration

Solving the problem of 2R integration requires a new viewpoint. Only after gaining a good understanding of the absence of clear criteria to exactly assess the contribution of each of these rays, it is possible to abandon the illusion that actual crime can be measured precisely. Only after clearly perceiving that these two rays show different aspects of crime, that both rays have serious limitations and that it is not clear as to which ray should be used to which extent in assessing crime rate, we can move to the idea that *the integration of two ray information can only be based on agreement*. 2R integration, choosing a specific method of integration from many possible methods after comparing the available options, can bring a new quality of the assessment of crime, compared to two separate rays.

This situation is similar to the one that existed in the past, when indicator of crime *rate* was not used at all. At that time it was problematic to compare crime in different territories. The number of recorded crimes was not suitable, because the number of population in comparable territories was very different. For this purpose, a new indicator (crime rate) was developed, which has combined two entirely different values in a particular manner – the number of recorded crimes and the number of population. At present, *the indicator combining the recorded crime statistics and crime victim survey data is needed for criminology and to assess crime differences, when faced with very different pictures of crime given by these two measuring methods* (two rays).

We can create 2R integration models for the types of crime that can be measured by using victimisation surveys. We seek to create the model as simple as possible.

What are the numbers of crime rate in a given territory and time period based on both rays? There are three basic values of crime (see Figure 1):

1) *Rec* – number of recorded crimes per 100 thousand inhabitants;
2) *Vict* – number of crimes suffered by the respondents, calculated per 100 thousand of inhabitants (the result from the victimisation survey);
3) *Rep* – number of crimes reported by respondents to the police, calculated per 100 thousand of inhabitants (the result from the victimisation survey).

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8 McDowall, D., & Loftin, C. What is convergence and what do we know about it? In J. P. Lynch & L. Addington (Eds.), Understanding Crime Statistics: Revisiting the Divergence of the NCVS and UCR. 2006, pp. 93–121. Cambridge: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511618543.004. [accessed 09.10.2016]

9 Ansari, S. Estimating Crime Rates from Police Reports and Victim Surveys: Progressive Convergence in Time Series Analyses. El Paso: LFB Scholarly Publishing LLC. 2013. http://doi.org/10.1007/s10611-015-9558-6. [accessed 09.10.2016].

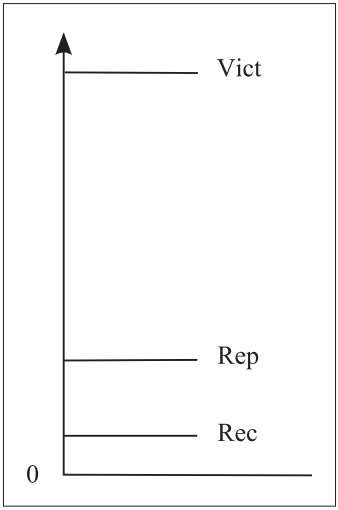


Figure 1. Basic values of crime obtained from the two rays

Vict number may be considered as the upper limit (roof) of the actual crime rate, because the people answering the questions evaluate the events according to their understanding, they are not qualified lawyers; legally significant circumstances are not investigated. After investigation, some events would not be qualified as crimes. Moreover, according to Tourangeau and McNeeley[10] "respondents can only make the errors it is logically possible for them to make; if most of them have not in fact experienced the target events, they can only over report them. Moreover ... forgetting does not necessarily make us underreport events. Forgetting when something happened or what exactly took place can lead us to report events that do not really count. And the same cues that can help us remember an event can also encourage us to report incidents that do not meet the requirements of a survey's questions." Victimisation rates are inflated due to the "telescoping" effect, when incidents occurring outside the reference period are reported to the interviewer[11]. Several people can report on the same crime (for example, many people may have suffered from the same computer virus). The actual crime rate is likely to be less than *Vict*.

Rec number can be considered as the lower limit (floor) of the actual crime rate, because it is obtained by qualified lawyers after assessing (investigating) the legally significant circumstances. In addition to *Rec*, there are unreported crimes and reported crimes

10 Tourangeau, R., & McNeeley, M. E. Measuring Crime and Crime Victimization: Methodological Issues. In J. V. Pepper & C. V. Petrie (Eds.) ‚Measurement Problems in Criminal Justice Research: Workshop Summary (pp. 10–42). Washington: The National Academies Press. 2003, pp.10-42. http://doi.org/10.17226/10581. [accessed 09.10.2016]

11 Skogan, W. G. Issues in the Measurement of Victimization. Washington: U.S. Department of Justice. 1981. http://doi.org/10.2307/3439966. [accessed 09.10.2016]

that have not been recorded due to recording 'filters'. Recorded crime data need to be used when assessing crime rate, as recorded crime data is the most reliable in the sense that we are confident that the actual number of committed crimes is not less than the number of recorded crimes.

The *estimate* of the actual crime rate is somewhere between *Vict* and *Rec*. Where is the estimated crime rate? We use the basic three values mentioned above in order to determine it. The crime rate reported to the police is the third number that can be used when drawing the estimated crime rate line between these two rays.

The author of this article has created 2R integration models for the *assessment* of crime rate by entering crime rate indicator entitled RAS (**R**ecorded **A**nd **S**urveyed). RAS indicator means *the rate of crime per 100 thousand inhabitants* obtained from certain integration (model) of recorded crime rate (*Rec*) and rate of crime (*Vict*) obtained from victimisation survey.

Model 1

$$RAS1 = Rec + (Vict - Rec)(Rep/Vict) \quad (1)$$

As shown in Eq. (1), the crime indicator RAS1 is obtained by adding the rate of non-recorded crimes (Vict and Rec difference) (multiplied by the coefficient Rep/Vict) to the rate of recorded crimes. Here Rep/Vict is the weight coefficient ($0 \leq Rep/Vict \leq 1$), which is obtained from the victimisation survey and means crime reporting level.

Advantages. In the case of RAS1, the addition to the Rec is based on respondent answers. These answers are not seen as absolute, but are based on the reporting level coefficient Rep/Vict – taking into account the respondent's evaluation of crimes suffered by them, the level of importance, danger and harm of these crimes, the number of respondents willing to protect their rights and liberties from such crimes, the number of respondents that tended to report to the police, etc. Repeated and potentially dangerous influence of the police that can eliminate the addition to Rec in cases when the police avoid recording crimes has been removed from the addition to Rec in RAS1 formula.[12]

Limitations. The value of the addition to the Rec is calculated according to the subjective assessments of respondents (whether to report or not to report the crimes). The respondents' propensity to report crimes and the compliance of the qualifying attributes of these crimes with criminal law are different issues.

Model 2

$$RAS2 = Rec + (Vict - Rec)(Rec/Rep) \quad (2)$$

As shown in Eq. (2), RAS2 indicator differs from RAS1 by the weight coefficient Rec/Rep. Coefficient Rec/Rep means the recording level of reported crimes, the part of reported crimes that was recorded. It depends on the following: (1) the part of crimes from Rep that the respondents actually and properly[13] reported to the police; (2) the part of

12 See details in the next Section of this article (The most suitable model).

13 In some cases the victim reports to the police about the incident by phone. The police invite the victim to come in order to record the precise circumstances of the event in the appropriate legal documents. But sometimes the victim does not appear at the police, the police fail to record the criminal offence in the absence of a written complaint of the victim, etc. We consider that in such cases the victim failed to properly inform about the event.

reported crimes confirmed after assessing the significant legal circumstances and performing the investigation; (3) the strength of recording 'filters' in the police.

Advantages. We consider that the same part of crimes would be recorded from suffered but unrecorded crimes as in the case of the part of reported crimes. We rely on qualification and abilities of the police to investigate the significant legal circumstances of the incident and to assess whether the event constituted a crime.

Limitations. RAS2 is based on a greater role of the police; it reflects its qualification, as well as the willingness or unwillingness to record all crimes. If the police avoid recording some type of crimes (Rec/Rep → 0), even if Vict is very large, Vict will hardly affect the indicator RAS2. If Rec/Rep → 0, then RAS2 → Rec. The police played a very decisive role in case of the RAS2. This is not suitable, especially in countries where the police avoid recording crimes in order to demonstrate a better crime situation.

Model 3

$$RAS3 = Rec + (Vict - Rec)(Rec/Vict) \quad (3)$$

As shown in Eq. (3), RAS3 indicator differs from RAS1 by the weight coefficient Rec/Vict. Coefficient Rec/Vict means the recording level of crimes calculated on the basis of the victimisation survey, the part of crimes suffered by respondents that was recorded.

Limitations. In the 2R integration no longer uses the number of reported crimes Rep, which provides meaningful information on the relationship between Vict and Rec. RAS3 value largely depends on the Rec and Rec/Vict ratio. If the police avoid recording some type of crimes (Rec/Vict→0), even if Vict is very large, Vict will hardly affect the indicator RAS3. If Rec/Vict→0, then RAS3→2Rec (RAS3 value approaching to the Rec multiplied by two).[14] Rec has a crucial effect on the RAS3 value (as far as the police 'filters' crimes, how many crimes it records). This is not suitable.

Model 4

$$RAS4 = Rec + (Vict - Rep) \quad (4)$$

As shown in Eq. (4), we obtain crime indicator RAS4 by adding the rate of non-reported crimes (Vict and Rep difference) to the rate of recorded crimes.

Advantages. We exclude the reported but unrecorded crime rate from integration, since this is the number of crimes that has not been confirmed after assessing the legally significant circumstances in the police, meaning that these were not crimes. In our opinion, we cannot reduce the number of non-reported crimes until it is not proved, as the number of non-reported crimes actually has not been confirmed after the investigation.

Limitations. In this case the question arises why do we consider more important the facts that the respondents consider less important? That is, we are using the non-reported number of crimes (Vict - Rep), and we are not using the reported number. Moreover, we consider that, after investigating the significant legal circumstances, all such non-reported crimes would be 100% proven as true crimes. This is unlikely. Moreover, we cannot

14 We can transform the RAS3 formula as follows: RAS3 = Rec + (Vict – Rec)(Rec/Vict) = Rec + Vict(Rec/Vict) – Rec(Rec/Vict) = Rec + Rec – Rec(Rec/Vict). If the police record a very small part of the suffered crimes because of recording 'filters' and/or because the respondents fail to report the crimes they suffered to the police, then [Rec(Rec/Vict)]→0. This means that no matter the times that Vict is greater than Rec, RAS3 will never exceed the double Rec.

consider that all the reported crimes were properly reported to the police and properly recorded. Among the reported but unrecorded crimes are crimes unrecorded due to errors in qualifying crimes or due to police 'filtering'.

Model 5

$$RAS5 = Rec + (Vict - Rep)(Rep/Vict) \quad (5)$$

As shown in Eq. (5), RAS5 indicator differs from RAS4 by the weight coefficient Rep/Vict.

Advantages. Reported but unrecorded number of crimes is excluded from integration, as in the case of RAS4. However, without overestimating the number of non-reported crimes, we are reducing this number, as crimes not confirmed after the investigation can feature among non-reported crimes.

Limitations. We consider (as in the case of RAS4) that process Rep→Rec is ideal. However, absolute elimination of the reported but unrecorded number of crimes from RAS5 indicator is not allowed on the basis of the arguments made in the case of RAS4. Moreover, we are reducing the number of non-reported crimes by using a reporting-level coefficient, but respondent propensity to report crimes and the matching qualified attributes of crimes in terms of criminal law are different issues.

Model 6

$$RAS6 = Rec + (Vict - Rep)(Rec/Rep) \quad (6)$$

As shown in Eq. (6), RAS6 indicator differs from RAS5 by the weight coefficient Rec/Rep.

Advantages. We exclude the reported but unrecorded number of crimes from integration, as in the case of RAS4 and RAS5. We are not overestimating the number of non-reported crimes, as in the case of RAS5. We consider that in the case of non-reported crimes, the same part of crimes would be confirmed as in the case of reported crimes.

Limitations. Not necessarily the same part of unreported crimes is legally justified as in the case of the part of reported crimes. RAS6 formula may be transformed as follows: $RAS6 = Rec + (Vict - Rep)(Rec/Rep) = Rec + Vict(Rec/Rep) - Rep(Rec/Rep) = Rec + Vict(Rec/Rep) - Rec = Vict(Rec/Rep)$. It follows that RAS6 is inversely proportional to the Rep. In this case, the higher the Rep, the lower the RAS6. It means that the more crimes reported by respondents (as they find them dangerous, more significant), the lower is RAS6, and vice versa. That is illogical.

Model 7

$$RAS7 = Rec + (Vict - Rep)(Rec/Vict) \quad (7)$$

As shown in Eq. (7), RAS7 indicator differs from RAS6 by the weight coefficient Rec/Vict.

Advantages. The reported, but unrecorded number of crimes is excluded from integration, without overestimating the number of non-reported crimes, as in RAS5 and RAS6 cases. We consider that the same part of crimes would be recorded from non-reported crimes as in the case of the part of crimes suffered.

Limitations. If the police avoid recording certain types of crimes (Rec/Vict →0), Rec will reduce the value of the indicator RAS7, even if Vict will be very large, (RAS7 will approach the Rec multiplied by two, as shown in the RAS3 model). Moreover, the legally justified part of unreported crimes must not necessarily match the exact number of recorded crimes suffered.

Model 8

$$RAS8 = Rec + (Vict - Rep)(Rep/Vict) + (Rep - Rec)(Rec/Rep) \quad (8)$$

As shown in Eq. (8), we add the appropriate parts of unrecorded crimes to Rec, multiplied by the appropriate weight coefficients that characterise the appropriate crime declining process (the nature of the process and its influence). RAS8 reflects the reporting process (Vict→Rep) and the recording process (Rep→Rec).

Advantages. The non-reported part of crimes and the reported, but unrecorded, part of crimes – both parts are used in the process of 2R integration using the appropriate weight coefficients that reflect the strength of appropriate processes (Vict→Rep and Rep→Rec).

Limitations. The addition to Rec in RAS8 formula is divided into two parts, one of which (that characterises the recording process Rep→Rec) gets strong influence of the police through multiplier Rec/Rep. If the police avoid recording crimes, it can be almost completely eliminated from RAS8 part (Rep - Rec)(Rec/Rep) by the weight coefficient Rec/Rep →0. As a result, RAS8 → Rec + (Vict - Rep)(Rep/Vict) = RAS5. RAS5 limitations are mentioned above.

Model 9

$$RAS9 = Rec + (Vict - Rec)(N/10) \quad (9)$$

As shown in Eq. (9), we obtain crime rate indicator RAS9 by adding the rate of non-recorded crimes (Vict and Rec difference) (multiplied by the weight coefficient N/10) to the rate of recorded crimes. Here N is any indicator measured on a scale from 0 to 10. For example, N could be the average assessment of crime dangerousness, the level of danger posed by that type of crime to respondents. N values are on a scale from 0 (absolutely inoffensive) to 10 (very dangerous). If N→10 (the respondents such type of crime considers to be a very dangerous), then RAS9 → Vict. That is, the rate of crimes valued as highly dangerous by respondents will be determined by the victimisation survey results (Vict), even if such crimes are much less recorded, compared to the victimisation survey results. If N → 0 (the respondents consider such type of crime to be absolutely inoffensive), then RAS9→Rec. That is, the rate of crimes assessed by respondents as absolutely inoffensive will be determined by the recorded crime rate Rec.

Similarly, N can be the average assessment of crime significance to respondents (the level of significance of that type of crime to respondents). N may be another indicator characterising crimes or the relationship between two rays, varying from 0 to 10.

Advantages. The crimes suffered by respondents but unrecorded are not evaluated in absolute terms, but depending on how respondents evaluate them according to their seriousness, significance or the like.

Limitations. In the 2R integration the rate of reported crimes Rep is no longer used, which provides meaningful information on the relationship between Vict and Rec. Moreover, the indicator RAS9 requires additional data (the N number) about each type of crime used in victimisation survey. In addition, a simple measurement of N values on a scale from 0 to 10 is subject to limitations. It is difficult for the respondent to correctly assess the value of crime dangerousness to assign (0 or 1, or 3...). Depending on various circumstances, the same type of crime could be assessed as more dangerous or less dangerous. The respondents differently viewed the circumstances of crime. Such measurement, when the respondents are asked to estimate the specific type of crime, for example, according to dangerousness on a scale from 0 to 10, is only a first approximation to a

more precise measurement of the dangerousness of crimes. The indicator N required more resources than in the previous RAS models. Tools for the measuring of indicator N should be developed and the indicator N must be measured.

Model 10

$$RAS10 = Rec + (Vict - Rep)(N/10) \quad (10)$$

As shown in Eq. (10), RAS10 indicator is similar to RAS9. All the above aspects about the RAS9 indicator are relevant to RAS10. RAS10 indicator has additional (compared to RAS9) limitations discussed above (in RAS4, RAS5, RAS6 and RAS7 models). Why do we consider more important the facts that the respondents consider less important? That is, in 2R integration we use the rate of non-reported crimes (Vict and Rep difference), but not the rate of reported and unrecorded crimes, and consider that the recording process of crimes is ideal (no recording 'filters' in the police and the respondents always properly report crimes to the police).

Mixed models

We can use the average value of several (or even all) models, or their any other combination in 2R integration. For example, the RAS = (RAS1 + RAS8)/2 or RAS = (RAS1 + RAS2 + ... + RAS10)/10. However, the junction of several indicators would make the calculation of RAS indicator more sophisticated, and the reasoning of the RAS indicator more complicated and unclear.

3. Results

3.1. The most suitable model

We will firstly compare these models by comparing their limitations, because we can easily reject the unsuitable models. The RAS2, RAS3, RAS6 and RAS7 models are not suitable, as the police have a decisive influence on the RAS values, when they avoid recording crimes.

The RAS4 and RAS5 models are not suitable, as in these models we consider that the Rep→Rec process is ideal. Absolute elimination from RAS indicator the reported but unrecorded number of crimes is not allowed, because even in the most advanced countries of the world police use recording 'filters'. Moreover, the victims fail to properly report all crimes.

The RAS8 model is not suitable, as in the case of strong recording 'filters' the formula part of non-reported crimes (which respondents felt were less serious) would be used in RAS8 calculations, but the formula part of reported crimes (which respondents felt were more serious) would be almost eliminated. It would be illogical.

It seems that the RAS9 and RAS10 models are not suitable because of the difficulties of measuring N indicator. It is difficult for the respondent to assess the exact value to assign to N (0 or 1, or 3...). The assignment of N value depends on various subjective and objective circumstances. The uses of Rep values in RAS formula are more suitable than N values. Respondents can easily answer whether or not they reported the incident to the police. Additionally, for obtaining the values of the indicator N in RAS9 and RAS10 models, more resources were required than in the previous RAS models (additional values of N are needed).

Mixed models (the junction of several indicators) are not suitable, as it would make the calculation of indicator RAS more sophisticated, and the reasoning of RAS indicator would be more complicated and unclear.

After removing all the models with the important limitations, the RAS1 model remains, which has minimum limitations. It seems that the *most suitable model of 2R integration is the RAS1 model.*

The example of RAS1 calculation based on robberies in Lithuania in 2007. According to the nationally representative victimisation survey (Centre for Crime Prevention in Lithuania, 2008) carried out by the Centre for Crime Prevention in Lithuania from 1001 respondents aged 15-74 (sample of the poll), 22 respondents suffered from 24 robberies in Lithuania in 2007. (24/1001)100000=2398 robberies per 100 thousand people aged 15-74 in Lithuania in 2007 according to the victimisation survey (Vict = 2398).

The respondents said that they reported about 14 cases (58%) of robberies suffered by them to the police. According to the victimisation survey, there are Rep=(14/1001)100000=1399 cases of robberies per 100 thousand inhabitants aged 15-74, which have been reported to the police in Lithuania in 2007.

3802 robberies have been recorded in Lithuania in 2007 (Information Technology and Communications Department, 2008). The number of Lithuanian population aged 15-74 was 2 626 939 at the beginning of 2007[15]. According to the recorded crime statistics, in 2007 there were Rec=(3802/2626939)100000=145 robberies per 100 thousand inhabitants[16] aged 15-74. RAS1 calculation is shown in Eq. (11).

RAS1 = Rec + (Vict – Rec)(Rep/Vict) = 145 + (2398 – 145)(1399/2398) = 1459 (11)

See Figure 2 for the proportions between Vict, Rep, Rec and RAS1.

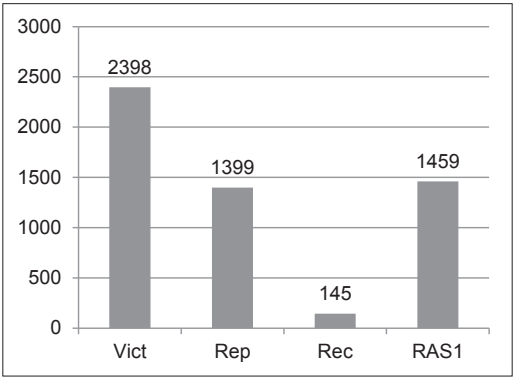


Figure 2. Robber y rate per 100 thousand inhabitants in Lithuania in 2007

15 Statistics Lithuania. Number of Population at the Beginning of Year. 2007 http://db1.stat.gov.lt/statbank/selectvarval/saveselections.asp?MainTable=M3010206&PLanguage=1&TableStyle=&Buttons=&PXSId=3212&IQY=&TC=&ST=ST&rvar0=&rvar1=&rvar2=&rvar3=&rvar4=&rvar5=&rvar6=&rvar7=&rvar8=&rvar9=&rvar10=&rvar11=&rvar12=&rvar13=&rvar14. [accessed 05.09.2015]

16 We consider that, from all the reported robberies in Lithuania in 2007, only population aged 15-74 suffered from these crimes. But that is not entirely accurate, since a part of Lithuanian residents and a part of non-residents of different age suffered from the part of the recorded robberies. However, we do not have the accurate numbers that we need.

What is the *relationship between Vict, Rep, Rec and RAS1 in actual (real) data in a broader context* embracing more than one type of crime? We will investigate this relationship on the basis of the example on crime in Lithuania in 2011. The following 13 types of crime were used in the criminal victimisation survey[17]: robbery; theft; extortion of property; swindling; destruction of or damage to property; sexual assault; sexual harassment; causing physical pain or health impairment; murder threat or terrorising; violation of public order; offering, giving or selling drugs; unlawful influence on electronic data; claiming a bribe[18]. According to the survey results, the Vict value of all of the crimes in total is equal to 64257. If Vict crime rate were equated to 100%, Vict, Rep, Rec and RAS1 relationship of all these crimes in total would be as shown in Figure 3. We see that the respondents reported only 30% of these crimes to the police and the police recorded only 3% of the crimes, and RAS1 is equal to 32.1%.

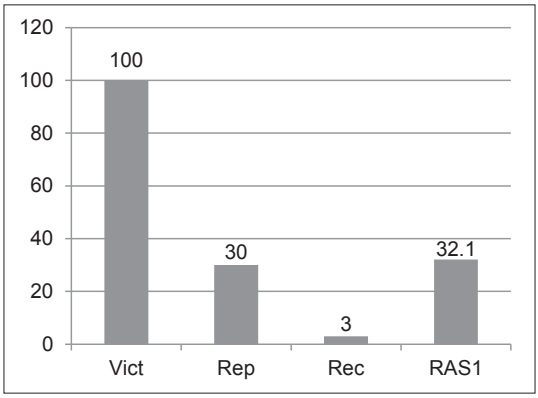


Figure 3. The relationship between crime indicators for all 13 types of crime (in total) in Lithuania in 2011, %

In the RAS1 formula, the addition to Rec is determined solely on the basis of respondents' answers. These answers are not kept absolute, but based on the coefficient of reporting level (Rep/Vict) – taking into account the respondent's evaluation of crimes suffered by them, the level of importance and danger of crimes to them, the number of respondents willing to

17 The nationally representative victimisation survey was conducted by the researchers of Mykolas Romeris University. The survey was conducted throughout the entire territory of the Republic of Lithuania; it encompassed interviews of 2006 residents aged between 15 and 74. The respondents for this survey were selected with the help of multilevel stratified random selection. The interviewing was conducted by the Lithuanian and British public opinion and market research company "BALTIC SURVEYS Ltd". The respondents were asked: whether in 2011 they were affected by different criminal offences (individual victimisation); the number of times that they have experienced such type of victimisation in 2011 in Lithuania; the number of the criminal offences reported by them to the law enforcement authorities (the police).

18 Justickis, V., Uscila, R., & Kiškis, A. Two-Rays Approach in the Integration of Victimological and Recorded Data on Criminality. Jurisprudencija [Jurisprudence], 2012, 19(2), 803–820. http://www3.mruni.eu/~akiskis/Alfredo-str2012-2.pdf. [accessed 09.10.2016]

protect their rights and liberties from such crimes. Indeed, only the crimes important to the society should be criminalised. If the respondents fail to report the conduct from which they have suffered, it is unreasonable to consider this conduct as significant and to include the information on such conduct in the integrated assessment of crime. Of course, respondents may not report even on significant and dangerous crimes due to various circumstances and they have a right for this. However, assessing crime on the basis of empirical data, using the empirical-analytical method of cognition, we must refer to the data that can be observed and measurable. We can measure specific actions (to report or not) easier and more accurately than feelings (the assessment of crime dangerousness or importance to people).

If the police records a very small part of crimes because of existing 'filters' and/or because the respondents do not report crimes, then RAS1 → (Rec + Rep)[19]. In this case, the sum of the recorded and reported crime rates had a crucial influence on RAS1 value. The police alone cannot highly reduce RAS1, as Rep still remains (see Figure 4). RAS1 reaction to Rec→0 is suitable.

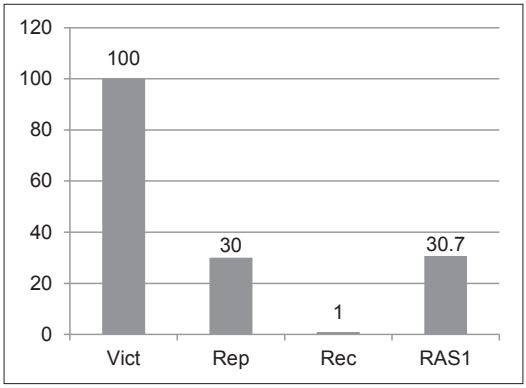


Figure 4. The relationship between crime indicators, when Rec→0

In some countries, the police seek to reduce the recorded crime rate in order to please the government, to show better situation of crime and/or to avoid the heavy workload. We can assume that in order to reduce crime indicators, the police may also artificially reduce the indicator RAS1. If the police act in a way that people don't want to inform the police about crimes, the latter would thereby reduce the reporting level (Rep/Vict) and RAS1 would decrease accordingly. However, police work in democratic states is measured by trust in the police and on the basis of other performance-related indicators, and not by the recorded crime rate. Seeking to reduce the reporting level of crimes (Rep/Vict), the police inevitably will reduce population confidence in the police. Moreover, the police are not considered to be a major factor responsible for crime control in advanced countries, in which criminological knowledge is widespread. The perception in such countries is that the police act quite narrowly and mostly social, economic, cultural, political and other factors

19 We can transform the RAS1 formula as follows: RAS1 = Rec + (Vict – Rec)(Rep/Vict) = Rec + Vict(Rep/Vict) - Rec(Rep/Vict) = Rec + Rep - Rec(Rep/Vict). If the police record a very small part of the crimes suffered because of the existing 'filters' and/or because the respondents fail to report crimes, then [Rec(Rep/Vict)] → 0.

that the police are unable to control have a greater impact on crime rate. It is also perceived that the recorded crimes fail to show the true picture of crimes, that the recorded crimes are only a small part of actual crime. Such countries perform victimisation surveys, the results of which are evaluated together with the recorded crime statistics. A complex assessment of 2R in such countries may lead to the disclosure of the artificial reduction of the number of recorded crimes. Furthermore, the police that artificially reduce the number of recorded crimes in order to improve the results of 'fighting against crime' are sawing off the branch they are sitting on, which creates the prerequisites for reduced funding to the police. The mechanism is triggered sooner or later.

Rep makes the largest impact on RAS1. The factors determining whether the victim will report the offence suffered by it to the police are well known (Del Frate et al., 1999; MacDonald, 2001; Posick, 2014; Skogan, 1994; Tarling & Morris, 2010). Reporting or non-reporting about the event is determined not only by the police treatment of victims. The decision whether to report or not will result from a complex decision-making process in which the victim will weigh the costs and benefits of each course of action. The decision depends on the victim's personal features and victimisation experiences. However, all of the previous studies have revealed that *the seriousness of the offence, however measured, is the most important factor influencing victims' decisions to report crime*[20].

When the police record almost every crime on which they were informed (Rec→Rep), then RAS1 is significantly higher than Rep (see Figure 5). This situation means that the police duly records reported crimes and does not 'filter' them. Moreover, it means that the investigation of legally significant circumstances of almost every such crime is confirmed and they are true crimes. This means that many crimes that would be proven if legally significant circumstances were investigated appear among unreported crimes. RAS1 reaction to Rec→Rep is suitable.

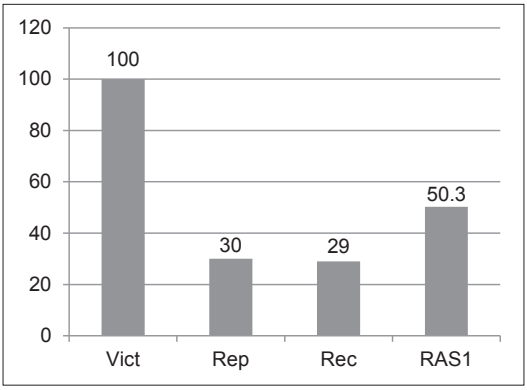


Figure 5. The relationship between crime indicators, when Rec→Rep

If Rep→0, then Rec→0 and RAS1→0. Such a situation is very rare in practice. People would not be willing to report on crimes if they did not see them as harmful and dangerous. Then a question arises about the validity of criminalisation of such deeds. RAS1 reaction to Rep→0 is suitable.

20 Tarling, R., & Morris, K.. Reporting crime to the police. British Journal of Criminology, 2010, 50(3),pp. 474–490. http://doi.org/10.1093/bjc/azq011.

If Rep→Vict (almost all crimes are reported to the police), then RAS1 is greater than Rep and less than Vict (see Figure 6). This situation (Rep→Vict) means that such crimes are very serious, very dangerous according to the respondents' assessments and their reactions. The value of RAS1 indicator is mainly affected by Rep. However, RAS1 is not equal to Rep. RAS1>Rep. Among the unreported crimes, some crimes are confirmed after the investigation of legally significant circumstances and they become true crimes. The higher the Rec, the greater the RAS1. When Rep→Vict and Rec→Rep, then RAS1→Vict.[21] RAS1 reaction to Rep→Vict and to (Rep→Vict and Rec→Rep) is suitable, RAS1→Vict.

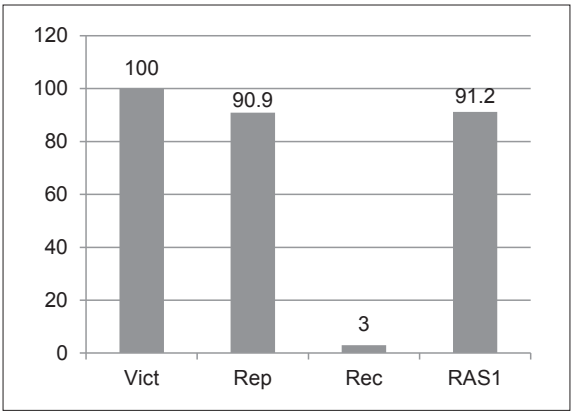


Figure 6. The relationship between crime indicators when Rep→Vict

When Rec→Vict (almost all crimes experienced by respondents are recorded), then RAS1→Vict (see Figure 7). RAS1 reaction to Rec→Vict is suitable.

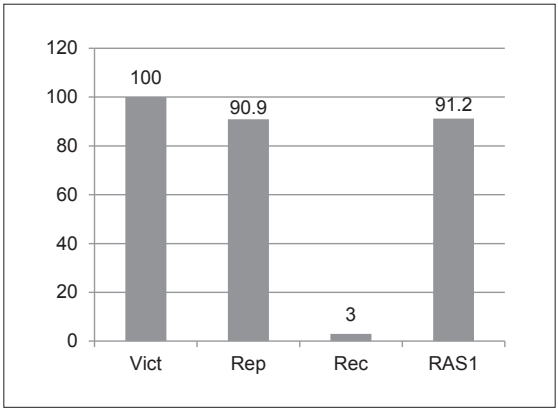


Figure 7. The relationship between crime indicators, when Rec→Vict

21 As shown above, RAS1 = Rec + Rep - Rec(Rep/Vict). When Rep→Vict, then RAS1→ Rec + Rep - Rec(Rep/Vict) →Rep→Vict.

3.2. Is crime rate rising or falling?

RAS indicator[22] is not created in order to exactly detect the actual crime rate as it is impossible. RAS indicator is designed to assess the differences of crime rate across time and space. The importance of the RAS indicator can be shown by using two simple examples. We will try to assess the change of crime rates (thefts and physical violence) in Lithuania in 2011, compared to 2007. This choice is determined by the fact that the crime victim survey data on these types of crime is available for 2007 and 2011[23]. The same methodology and question wording was applied in those surveys.[24]

Recorded crime rate of thefts and physical violence *increased* in Lithuania in 2011, compared to 2007. However, according to victimisation surveys, both crime rates *fell* (see Figure 8). The actual situation cannot be measured exactly. We can rely more on one or another source of information and use some considerations for drawing conclusions on the changes in crime rate. Different researchers of the same data will make unequal, even opposite conclusions. However, politicians, practitioners and even the general public need to answer the question whether crime is rising, falling or remains unchanged. They need to know this in order to decide on the level of resources to devote for crime prevention and control. If they hear different, even conflicting answers of criminologists, they will not know the proper solution, avoid deciding on resource allocation for crime prevention and control, and will not want to allocate resources to criminological research.

22 From now on, in this article we consider that RAS=RAS1 (the most suitable model).

23 Justickis, V., Uscila, R., & Kiškis, A. Two-Rays Approach in the Integration of Victimological and Recorded Data on Criminality. Jurisprudencija [Jurisprudence], 2012, 19(2), 803–820. http://www3.mruni.eu/~akiskis/Alfredo-str2012-2.pdf. [accessed 09.10.2016]; Centre for Crime Prevention in Lithuania. Victimization experiences in Lithuania in 2007. 2008. http://www.nplc.lt/centrov/reng/ren002/ren002-tyrimo-ataskaita.doc. [accessed 25.04.2014]

24 A nationally representative survey of 1 001 respondents on criminal victimisation in Lithuania in 2007 was performed on 10-13 April 2008. The survey was commissioned by the Centre for Crime Prevention of Lithuania. The interviewing was conducted by an independent public opinion and market research institution Vilmorus Ltd. A nationally representative survey of 2 006 respondents on criminal victimisation in Lithuania in 2011 was performed from 24 February to 31 March 2012. The survey was commissioned by Mykolas Romeris University. The interviewing was conducted by the Lithuanian and British public opinion and market research company BALTIC SURVEYS Ltd. The same wording was used in both surveys: (1) Has your property of a value over 130 LTL ever been stolen or has there been an attempt to steal it from you personally during 2007/2011 in Lithuania? (thefts); (2) Have you ever been beaten or suffered from physical pain or health impairment caused by others using other types of violence during 2007/2011 in Lithuania? (physical violence).

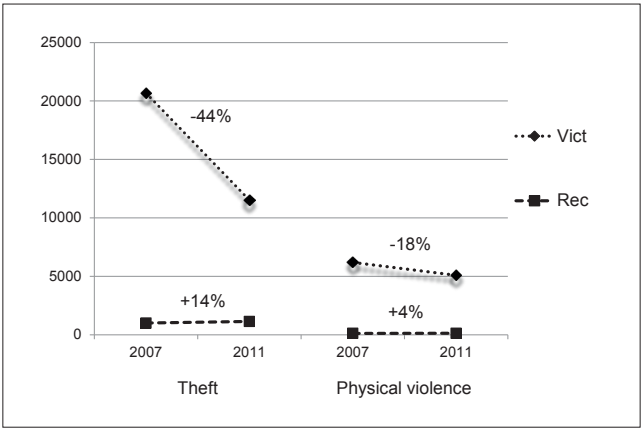


Figure 8. Thefts and physical violence crime rates (Vict and Rec) per 100 thousand of inhabitants in Lithuania in 2007 and 2011

A possible solution to this situation is a new measurement (evaluation) tool – the RAS indicator. Using the RAS indicator, all the criminologists will equally report to the public, policy makers and practitioners: "*RAS crime rate indicator shows that the theft rate declined by 32%, while the rate of physical violence increased by 8% (see Figure 9). At present, it is the best tool for measuring the change of crime rate.*"

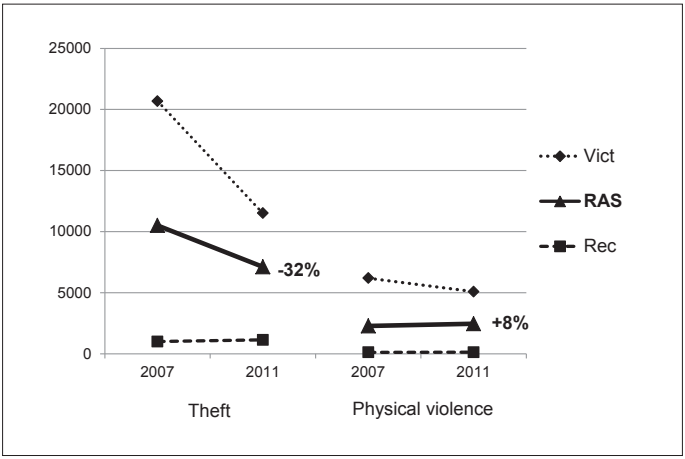


Figure 9. Thefts and physical violence crime rates (Vict, RAS and Rec) per 100 thousand of inhabitants in Lithuania in 2007 and 2011

We have shown the result of RAS use in assessing differences between crime rates in time. By way of analogy, RAS can be used for assessing differences between crime rates in space, when comparing crime rates in different areas of the same state.

Discussion and conclusions

Despite the fact that the recorded crime data and victimisation survey data reflect different aspects of crime and show very different pictures of crime, these data reflect the same object – the crime, and can be integrated together in assessing crime rate. Recorded crime data and victimisation survey data must be summed in some way due to the fact that "results of the reverse record check showed that in 48% of cases a survey respondent did not mention victimization, even though it appeared in police registration" [25]. After analysing and comparing 10 possible and simple methods (models) of two-ray integration, the indicator RAS (the above-mentioned RAS1) was developed as the most suitable for recorded crime statistics and victimisation survey data integration. Crime rate indicator RAS is calculated as shown in Eq. (1).

RAS suitability is based on a suitable range of RAS values (Rec<RAS<Vict), suitable influence of Rec, Vict, and Rep to RAS value, interconnection of a wide range of aspects relating to crimes and their evaluation. The police cannot determine the value of RAS even if they avoid to record crimes. The reporting level integrates a wide range of features of these crimes, the respondents' assessment and reaction. The value of RAS indicator is mainly affected by the rate of crimes reported to the police (Rep), but RAS is not equal to Rep. RAS highly differs from Rep in certain situations. RAS indicator value also depends on the recorded crime rate (Rec) and on crime rate (Vict) calculated based on the victimisation survey. Rec and Vict values have a significant impact on the RAS indicator value in certain situations. The advantage of RAS indicator is that the values used in its calculations are relatively easily obtained (in most victimisation surveys the question is about reporting to the police).

When a new indicator RAS is obtained bringing together two ray information in certain way, we can evaluate the crime rate in an integrated manner, monitor and measure the value of an integrated indicator RAS and its alternation. The RAS indicator is proper for assessing crime rate differences over time and space *within the same state with the same criminal law and the same crime recording order, where crime definitions match in both 2R sources*. RAS indicator is not suitable for all types of crimes, but only for crimes against persons, which can be questioned in victimisation surveys.

What is the validity of RAS? According to Thornberry and Krohn[26], a measure is valid to the extent to which it measures the concept you set out to measure and nothing else. Validity concerns the crucial relationship between the theoretical concept one is at-

25 Averdijk, M., & Elffers, H. The discrepancy between survey-based victim accounts and police reports revisited. International Review of Victimology, 2012, 18(2), pp.91–107. http://doi.org/10.1177/0269758011432955.[accessed 0.10.2016]

26 Thornberry, T. P., & Krohn, M. D. Comparison of Self-Report and Official Data for Measuring Crime. In J. V. Pepper & C. V. Petrie (Eds.), Measurement Problems in Criminal Justice Research: Workshop Summary . Washington: The National Academies Press. 2003, pp. 43-94. http://doi.org/10.17226/10581. [accessed 09.10.2016]

tempting to measure and what one actually measures. It seems that the validity of RAS indicator is nearly perfect, if we assume that the RAS indicator measures the *reflections* of actual crime rate. Two main actors reflect actual rate of crime each from his point of view: 1) ordinary people (respondents) assess events (Vict) and reacts to them (Rep) and 2) the police (qualified lawyers) assess events and reacts to them (Rec). RAS indicator shows these assessments and reactions combined in a specific way. In addition, there is the third important actor involved in this assessment of crime rate. These are criminologists who develop and apply the methodology of crime victim survey. Respondents' assessments depend on questions, possible answers, explanations and other aspects of survey methodology. Can we measure crime rate without assessments and reactions, without participation of ordinary people, qualified lawyers and criminologists? It seems that all these elements are necessary. RAS indicator combines everything in one relatively simple way. The overall (integrated) use of several different measuring methods, each of which reflects different aspects of the object, allows us to better assess the relevant object.

RAS indicator allows qualitatively better assessment of crime rate, compared to the use of separate Rec, Rep and Vict indicators. This situation is similar to the image assessment by human eyes. A man using their both eyes at once sees a better (stereo) image. They can estimate the distance to objects. They cannot do this by using each eye separately.

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MATAVIMAS TO, KAS NEPAMATUOJAMA: REGISTRUOTO NUSIKALSTAMUMO IR VIKTIMO LOGINIŲ TYRIMŲ DUOMENŲ INTEGRAVIMO MODELIAI

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Santrauka. *Nusikalstamumas yra vienas iš svarbiausių kriminologinio pažinimo objektų. Svarbu yra žinoti, koks yra nusikalstamumo lygis, kaip jis kinta, kokia yra nusikalstamumo struktūra. Tai žinoti svarbu, kai mes vertiname nusikalstamumo žalą, skiriame išteklius nusikaltimų prevencijai, kai ieškome tinkamų jo prevencijos būdų, kai norime nustatyti, kokią įtaką turėjo mūsų poveikis nusikalstamumui. Tačiau kriminologai neturi įrankio, kuriuo galėtų tiksliai pamatuoti nusikalstamumą. Kartais jie negali net pasakyti, ar nusikalstamumo lygis didėja ar mažėja. Pavyzdžiui, kai registruoto nusikalstamumo statistika rodo nusikalstamumo lygio didėjimą, o viktimizacijos tyrimų (asmenų apklausų) duomenys rodo mažėjimą.*

Kriminologai supranta, kad nėra įmanoma tiksliai suskaičiuoti, kiek nusikaltimų buvo padaryta konkrečioje teritorijoje per konkretų laikotarpį. Visi skaičiavimo būdai yra netikslūs.

Kai kuriose šalyse nusikalstamumo analizė ir vertinimai yra daromi remiantis registruoto nusikalstamumo statistika. Tačiau įvairių tyrimų ir vertinimų duomenimis, nusikalstamų veikų lygis, apskaičiuotas remiantis viktimologinių apklausų rezultatais, yra kelis ar net keliasdešimt kartų didesnis už registruotų nusikalstamų veikų lygį. Specialistai sutaria, kad išvados apie nusikalstamumą, gautos nagrinėjant tik vieną informacijos šaltinį, yra nepatikimos.

Kitose valstybėse (JAV, Jungtinėje Karalystėje ir kitose) nusikalstamumo analizei naudojami du pagrindiniai informacijos šaltiniai (du spinduliai) – registruoto nusikalstamumo statistika ir reguliariai atliekamų viktimologinių tyrimų duomenys. Šie du informacijos šaltiniai, kaip dvi tos pačios monetos pusės, parodo skirtingus to paties reiškinio – nusikalstamumo – aspektus, jie vienas kitą papildo. Nusikalstamumo registravimas ir jo viktimologiniai tyrimai – tai tartum du spinduliai, apšviečiantys nusikalstamumą iš skirtingų pusių, parodančių skirtingus jo aspektus. Abu spinduliai dažnai rodo iš esmės skirtingą nusikalstamumo vaizdą, tačiau nėra aišku, kuriuo spinduliu ir kokia apimtimi reiktų remtis vertinant nusikalstamų veikų lygį. Neaišku, kaip apjungti, integruoti šių dviejų spindulių informaciją ir tuo pagrindu gauti tikslesnį nusikalstamumo vaizdą.

Registruoto nusikalstamumo statistikos ir viktimologinių tyrimų duomenų palyginimo ir panaudojimo įvairius aspektus nagrinėjo daug mokslininkų, tačiau nėra sukurtas šių duomenų integravimo (apjungimo) būdas (modelis), skirtas nusikalstamų veikų lygio ir jo kitimo vertinimui vienos valstybės teritorijoje, kompleksiškai panaudojant abu šiuos informacijos šaltinius (spindulius).

Straipsnio tikslas – įvertinti registruoto nusikalstamumo statistikos ir viktimologinių tyrimų duomenų (dviejų spindulių) palyginimo ir kompleksinio panaudojimo galimybes, sukurti modelį jų integravimui.

Išanalizavus ir palyginus 10 galimų paprastų integravimo metodų (modelių) sukurtas ir pritaikytas praktiškai nusikalstamumo lygio rodiklis RAS, labiausiai tinkamas registruoto nusikalstamumo statistikos ir viktimologinių tyrimų duomenų integravimui ir nusikalstamumo lygio palyginimui tos pačios valstybės teritorijoje. RAS rodiklis leidžia kokybiškai geriau įvertinti nusikalstamumo lygį, negu naudojant registruoto nusikalstamumo statistiką ar viktimologinių tyrimų duomenis atskirai.

Reikšminiai žodžiai: *nusikalstamumas; registruotas; viktimizacija; tyrimas; rodiklis*

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