

Cross-national comparison of crime statistics

An empirical study of the effect of different statistical rules

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The Swedish National Council for Crime Prevention (Brottsförebyggande rådet – BRÅ) has the task of producing the official statistics for the Swedish justice system in a way that allows for the conduct of cross-national comparisons. The objective is to improve existing knowledge in the area of crime level comparisons in order to study whether there are offence types covered by the official statistics that provide a suitable basis for cross-national comparisons. The focus is directed specifically at comparisons of crime levels since cross-national comparisons of trends have generally been viewed as less problematic. There is relatively good information available as to which statistical methods are employed in different countries. Knowledge is lacking, however, as to the significance of methodological differences for the crime statistics produced. The current study primarily takes the form of an examination of the effects of different *statistical methods* on crime statistics.

The present paper constitutes a summary of a more comprehensive study of these effects. The focus of the analyses is directed at the effects produced by different statistical methods, and in particular at the significance of cross-national variations in definitions relating to when crimes are registered, the way serial offences are dealt with and the consequences of the use of the principal offence method of counting crimes. The analyses are based on data from 1997 and on the statistical methods applied at that time. No adjustments have been made for changes in the rules employed nor in other conditions. The original report was written (in Swedish) by Mats Sonefors on the commission of the National Council for Crime Prevention.

All reported offences

In the context of cross-national comparisons of the total number of reported offences, Sweden often emerges as having very high levels of crime. One of the reasons for this is that Swedish crime statistics cover a very wide range of offences and include crime types that are not covered by the statistics of other countries. Other reasons include the more generous presentational rules, including amongst other things the statistical rules, employed in Sweden.

Table 1 suggests that people in Sweden are at higher risk of being exposed to crime than those in other countries. Statistics relating to the total number of reported offences are difficult to interpret, however, and are influenced by a number of different factors. One such factor is that statistics relating to the total number of reported offences never actually cover *all* crimes, but rather a sample of offence categories, and that the categories included in this sample vary from country to country. The reason for this variation is that the statistics have been formulated in order to meet the planning and governance needs of the respective countries. Unconditional comparisons based on *all* reported offences therefore produce a poor picture of different countries' crime levels.

Table 1.

Total number of reported offences per 100,000 of population, 1997 (1996).

Countries	Reported offences
Sweden	13,521
Denmark	10,068
Norway	9,770
England & Wales	8,576
Scotland	8,212
Germany	8,124
Finland	7,667
Austria	5,975
France	5,972
Italy	4,271
Ireland	2,581
Poland	2,568
Canada	8,690
South Africa	6,315
Australia	5,943
USA	5,078 *
Japan	1,570
Colombia	577
China	134

Source: Interpol 1997. * Figure relates to 1996.

Individual offence types provide a better basis for comparisons of crime levels. The picture becomes more differentiated and Sweden's ranking drops significantly in the context of a presentation based on individual crime categories. The figures for violent crime, homicide, rape and car thefts are high, and the figures for robbery average, whilst the figures for residential burglary are low. Studying individual offence types is not by itself sufficient, however. Consideration must also be paid to other factors that govern the contents of crime statistics. In addition to actual crime levels, crime statistics are governed by legal conditions, reporting and registration propensities, and statistical factors.

Until we know how much statistical and legal conditions, as well as reporting and registration propensities, affect crime statistics, it is not strictly possible to specify crime levels on the basis of the number of reported offences. Comparisons of crime levels in different countries present even more of a problem since cross-national variations in these factors will affect the outcome of such comparisons. This report examines only the extent of the significance of the most basic statistical rules for cross-national comparisons of crime. The goal of the analyses is that of estimating how much Sweden's crime statistics need to be adjusted in order to be able to conduct comparisons with the statistics produced in a number of other countries.

Statistical rules

The number of reported offences is affected by definitions and rules, which specify how crimes are to be presented statistically. To begin with, the statistics are affected by *the point at which the offences are registered*. The data that form the basis of crime statistics may be registered at different points between the time when the offence is initially reported, and the time at which the investigation of the offence is concluded. If the data are registered when the offence is first reported, the police's categorisation of offences will reflect the descriptions presented by those reporting them, prior to the investigation having produced additional information. If the data are instead registered during or subsequent to the conclusion of the investigation, this makes it possible to more precisely specify the extent to which an act constitutes a criminal offence, and how this act should be categorised, since more is now known about the event in question. In this latter case, the statistics are based to a greater extent on crimes that have actually been established as

such. On the other hand, there is a risk that not all criminal acts come to the attention of the police, as a result of different forms of selection process, for example. In Sweden, the data on which the statistics are based are registered at the time the offence is initially reported.

When there is an indication that crimes have been committed, these offences can be counted in a number of different ways from a purely statistical point of view. This is the case in relation to *multiple offences*, i.e. when more than one event, or a single event involving more than one perpetrator/victim, comes to the attention of the police. These events may then be registered as a single offence, or as several offences. In this context there are two typical patterns: counting in the form of serial offences, or counting in accordance with the principal offence method.

1. Serial offences may for example involve a woman reporting that she has been repeatedly assaulted by her husband. The phenomenon thus involves a number of similar offences where the victim and perpetrator remain the same, but which occur at different points in time. An extensive counting of such offences would mean registering each event as a separate offence. Alternatively, these same offences may be counted more restrictively. In the extreme case, they would be counted as only a single offence. In Sweden, the principal rule is that each specified event is counted as a separate offence.
2. The principal offence method of counting is employed in relation to cases where different offences are committed at the same time. This may for example be the case where a man first assaults his wife; when the police then intervene, the man resists arrest violently, and in the process kicks and damages the door of a police car. It is then possible either to count each act as a separate offence, or alternatively to register only the most serious offence committed, i.e. what is known as the principal offence. In Sweden, each act is registered as a separate offence.

The statistics are also affected by the way offences are counted at the *preparatory stage*; i.e. attempted offences, or preparing or conspiring to commit an offence. These may be treated as consummated offences, as attempted offences, or they may not be counted at all. In Sweden such crimes are presented as consummated offences to the extent that the

suspect is criminally liable, with the exception of murder, manslaughter, rape and car theft, in relation to which attempted offences are presented separately from consummated crimes. The statistics are also affected by the *point in time to which the statistics refer*. Statistical data may be registered in connection with the time at which the report is made, or that at which the offence is committed. If a woman goes to a police station in October 1999 and reports that she has been assaulted by her husband 50 times over the past five years, these 50 offences may be registered during 1999 or may be distributed across the different years over the course of which they were committed. In Sweden, all of the offences would be registered in 1999, in connection with the time they were reported.

An empirical analysis

This chapter studies the effects of different methods of statistical presentation. By simulating different statistical models, it is possible to calculate the effects that other countries' methods of presentation would have on Swedish crime statistics measured in terms of the number of reported offences.

The following three elements of the rules governing statistical production constitute the point of departure for this analysis: 1) at what point during the processing of offences the crimes are registered, 2) whether or not the principal offence method is applied, 3) whether serial offences are counted as a single offence or as several offences. The analysis simulates the number of reported offences that would have been counted in Sweden's official statistics if a more restrictive approach had been employed in relation to each of these three statistical factors. Thereafter, Sweden's crime statistics are adjusted to correspond with the combination of methods employed by each of the other countries in turn (see Table 2). The adjusted number of reported offences for Sweden is compared with the number reported in these different countries. The results are presented in a table, which ranks the countries in accordance with the number of reported offences by which each country exceeds or lies below the adjusted Swedish total.

Table 2. *Methods of statistical production in different countries: when offences are registered, whether the principal offence method is applied, how serial offences are counted.* Note: a “1” in the classification means that more reported offences are generated, a “0” that fewer reported offences are generated.

Model	Country	Point at which offences registered 1 = directly upon report 0 = after investigation	Principal offence method 1 = not applied 0 = applied	Way in which serial offences counted 1 = as several offences 0 = as a single offence
1	Sweden	1	1	1
1	Denmark	1	1	1
1	Finland	1	1	1
2	Norway	1	0	1
2	Ireland	1	0	1
3	England & Wales	1	0	0
3	Northern Ireland	1	0	0
4	Scotland	0	1	1
4	Italy	0	1	1
4	Switzerland	0	1	1
4	Austria	0	1	1
5	France	0	0	1
5	Germany	0	0	1
5	Hungary	0	0	1
5	Poland	0	0	1
6	Portugal	0	0	0
6	Greece	0	0	0
6	Holland	0	0	0

Source: Council of Europe, 1999. The analysis is based on empirical data collected from, A) The National Council’s database and B) Interpol and the (UK) Home Office.

a) In order to calculate the extent to which the Swedish data need to be adjusted, a sample of offences reported in 1997 were drawn from the database at the National Council for Crime Prevention. The sample includes all offence reports which include murder/manslaughter, robbery, rape, other violent crimes¹, car theft and residential burglary, and any other offences noted on these reports. In addition, all reports were included where the offence was assigned to one of these categories in connection with its being cleared, despite having been recorded under a different category at the time of the original report. The sample comprises 105,754 offence reports covering 124,597 reported offences. A total of approximately 1.2 million offences were reported in 1997.



b) The international comparison employs data from Interpol relating to offences reported in 1997 for the offences murder, manslaughter, robbery, rape, and car thefts, as well as

¹ Violent offences is an umbrella term which covers murder, manslaughter, assault, rape, robbery and acts

information on population size. For violent crimes and residential burglaries, data have been drawn from the 1997 crime statistics for England & Wales (Home Office).

Model effects

The countries examined employ different combinations of statistical methods (see Table 2). Each method combination produces a different “model” and the countries studied may be divided into the following six groups on the basis of the different models employed:

Model 1. Sweden, Denmark and Finland employ a model² that involves registration at the time of the initial offence report, where the principal offence method is not applied, and where serial crimes are registered as (several) separate offences.

Model 2. The model employed by Ireland and Norway also involves the registration of offences at the time of the initial report. These countries apply a principal offence method when crimes are reported, and serial crimes are registered as separate offences.

Model 3. England & Wales and Northern Ireland employ a model in which the offence is registered at the time of the initial report. Here, a principal offence method is also applied when crimes are reported but serial crimes are registered as a single offence.

Model 4. Italy, Switzerland, Scotland and Austria apply a model in which registration takes place subsequent to the investigation of offences. They do not apply the principal offence method, and serial crimes are counted as separate offences.

Model 5. The model employed in France, Poland, Germany and Hungary also involves registration subsequent to investigation. A principal offence method is applied at the time of the initial report and serial crimes are counted as separate offences.

of violence against public servants.

² Different models are based on the three elements involved in the methods of statistical presentation described above (the point at which the offences are registered, the way serial offences are counted and whether or not the principal offence method is applied). Statistical routines in Sweden are not completely identical to those employed in Finland and Denmark; see *Nordic Criminal Statistic 1950-1989*.

Model 6. In Greece, Holland and Portugal, the model involves registration subsequent to investigation, a principal offence method at the time of the offence report and the registration of serial crimes as a single offence.

The three different elements (point chosen for registration, and the counting practices employed in relation to serial crimes and principal offences respectively) simultaneously affect one another, for which reason the effects of the different methods cannot be summed. Instead, Sweden's reported crime statistics have been recalculated on the basis of each combination of elements (i.e. each model described above). This provides an indication of the extent to which Sweden's statistics have to be adjusted in order to produce a comparable figure in relation to each of the other countries and offence types respectively, once differences in the statistical conditions in the various countries have been taken into account. Table 3 presents the size of the resulting adjustments made to Sweden's statistics expressed in per cent.

Table 3. *Size of adjustment made to the number of reported offences registered in Sweden given the use of different countries' statistical models with regard to multiple offences and the point at which offences are recorded. Per cent.*

Model No.	Country	Murder/ man- slaughter	Attempted murder/ man- slaughter	Robbery	Rape	Attempted rape	Violent crime	Residential burglary	Car theft
1	Denmark	0	0	0	0	0	0	0	0
1	Finland	0	0	0	0	0	0	0	0
2	Ireland	0	-37	-3	-1	-29	-19	-3	-1
2	Norway	0	-37	-3	-1	-29	-19	-3	-1
3	England & Wales	-3	-40	-4	-16	-30	-22	-3	-2
3	Northern Ireland	-3	-40	-4	-16	-30	-22	-3	-2
4	Italy	-10	-15	-4	-17	-8	-11	-1	-1
4	Switzerland	-10	-15	-4	-17	-8	-11	-1	-1
4	Scotland	-10	-15	-4	-17	-8	-11	-1	-1
4	Austria	-10	-15	-4	-17	-8	-11	-1	-1
5	France	-11	-48	-7	-17	-36	-29	-4	-2
5	Poland	-11	-48	-7	-17	-36	-29	-4	-2
5	Germany	-11	-48	-7	-17	-36	-29	-4	-2
5	Hungary	-11	-48	-7	-17	-36	-29	-4	-2
6	Greece	-13	-51	-8	-29	-37	-32	-5	-2
6	Holland	-13	-51	-8	-29	-37	-32	-5	-2
6	Portugal	-13	-51	-8	-29	-37	-32	-5	-2

The results presented in Table 3 indicate that Swedish data would need to be adjusted to a varying extent in connection with different types of offence. Car thefts and residential burglaries would require an adjustment of one to two per cent, whereas the categories of attempted murder and rape would need adjusting by up to 51 per cent and 37 per cent respectively, in order for a cross-national comparison to take account of differences in the point at which crimes are registered and the methods employed to count multiple offences.

The results also show that Swedish data would require adjusting differently depending on the country with which these data were to be compared. Comparisons with Denmark and Finland would not require any adjustment at all, whereas Greece, Holland and Portugal employ statistical methods that would require the greatest adjustments to be made in order to take account of differences in the point at which crimes are registered and the ways in which multiple offences are counted.

Conclusion

The analyses show that it is important in certain cases to take the statistical rules employed into account in the context of cross-national comparisons of offences reported to the police. The results illustrate the role played by the most basic statistical rules in relation to comparing levels of crime on the basis of the crime statistics produced by different countries; for certain offence types, adjustments of a magnitude of 40 to 50 per cent are required. The study has been limited however to the effect of the statistical rules in relation to Swedish crime statistics, and does not provide a basis for any general description of the consequences of these rules. The study does however show that it is possible by means of relatively simple measures to calculate the effects of variations in the statistical rules employed in different countries. This may serve as a point of departure for a more comprehensive analysis of the significance of these statistical rules for comparisons of different countries' crime levels.