3. Attrition

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The DECODEUR project also focused on attrition, which is an important measure of criminal justice performance. It sought ways to define a comparable real or approximated attrition rate for future data collection and comparison. The attrition process was studied in detail and data availability and quality were checked.

3.1 Problems and pitfalls of attrition measurement

Attrition can be defined as the "loss" of cases or, more technically, the filtering out of cases during the criminal justice process (cf. Jehle 2012: 151). A large number of cases were usually filtered out. Many cases never come to the attention of any of the bodies involved in criminal proceedings (dark figure of crime), other cases become known to the police, but are not registered, yet others are registered, but no suspect is found. Even if a suspect is found, there might not be sufficient evidence to charge them in court, thus leading to dropping the case or proceedings on the prosecution level (for details, see Jehle et al. 2008) or already on the police level (cf. Elsner et al. 2008). Other cases can be dropped for legal reasons (e.g. *ne bis in idem*, statute of limitation, act not an offence). Several cases can also be combined to build up one new case, or be transferred to another authority, thus leading to a somewhat artificial loss of cases. But cases can usually be dropped not only for such reasons, but also due to lack of public interest or for efficiency reasons, especially relating to minor offences. In many countries, the prosecutor (or even the police) can also issue some kind of sanction, either as a condition for the case to be dropped, or in a more formalized procedure, which eventually leads to a conviction in summary proceedings without a court hearing.

Of those cases, which are brought before the court by means of an official charge (indictment), some cases are not accepted by the courts for legal or factual reasons. In other cases, the court hearings may take place, but the court might still drop the case conditionally or unconditionally, especially in cases of minor guilt. Of those cases ended by a final court judgment, some are acquittals. Finally, if one also considers the prisons as part of the criminal justice process, one will see that only a fraction of those convicted will be sentenced to an unsuspended prison sentence. This filtering function of the criminal justice process allows the process to be described as a kind of funnel (visualized, for example, in Jehle 2009: 9).

In addition to cases being filtered out, there are also processes of redefinition of offence charges: An offence that is defined as attempted murder on the police level might still be downgraded to bodily injury later on, what appeared to be

theft might later turn out to be fraud, etc. These changes may be due to legal reasons (correction of errors in the application of criminal law) or factual reasons (lack of evidence for the more severe charge), but they might also be the result of an agreement of the parties involved in the process (plea bargaining, negotiated agreement). Mere redefinition does not contribute to attrition when looking at the overall, total output of the criminal justice process, but the situation is different on the level of individual offences, where such processes will contribute to attrition for some offences. This attrition is, however, somewhat compensated by an increase of caseload for other offences, especially where statistics are organized in accordance with a principal offence rule.

Not all of the described possibilities for attrition will be available in all criminal justice systems. To identify the exact dynamics of attrition in any country, we therefore need an in-depth look at the national criminal law and, especially, criminal procedure law, combined with an equivalently close look at the reality of case processing in the system. A study aiming only at comparing crime and criminal justice statistics will, of course, not be able to engage in detailed comparison of legal systems. Hence, the project had to restrict itself to comparing the statistical input and output of criminal justice systems. A fully valid assessment of attrition is, however, possible only where statistics are available to following certain cases throughout the criminal justice process (e.g. all murder investigations started in 2009). Not all those cases recorded in a given year on the police level will also be brought before a court and be ended by a final judgment in the same year. Furthermore, redefinition of the offence can take place during the proceedings. One cannot be sure that all assault judgments were also started by assault-related investigations on the police level etc. Some might also have started as attempted murder, or some other offence.

3.2 Questionnaire on data and statistics on the flow of cases through the system

Because of this situation, it was clear that the project would be able to come to a complete and fully satisfying assessment of attrition in European comparison only if statistics were available in at least a critical number of countries across Europe to track the flow of cases throughout the whole criminal justice process. Hence, at a very early stage of the project it was decided that before trying to collect data on such case flow statistics across Europe, it would be necessary to first find out whether such statistics would be available at all. A separate questionnaire was designed, solely aiming at collecting metadata on that type of statistics. The questionnaire was circulated among the members of the enlarged Sourcebook group (including CEP experts).

The questionnaire was therefore expected to be filled in for 13 countries, namely:

Albania
Finland
France
Germany
Iceland
Italy
Netherlands
Poland
Romania
Spain
Switzerland
Turkey
UK: England & Wales

Answers were received for 12 countries (no response from Romania).

The questionnaire comprises seven different questions. The answers to these questions are summarized in the following.

3.2.1 Parts of the criminal justice process covered by official statistics / statistical databases

A first prerequisite of any type of case flow statistics is that preferably all relevant parts of the criminal justice process are covered by statistics. There is no combination of statistics possible where there are no statistics available. Table 25 shows the results for the 12 responding countries.

As the results show, the overall statistical situation in the responding countries is very satisfying, as in the majority of countries all types of crime and criminal justice statistics are available. Police, prosecution and prison statistics are available in all 12 countries. UK: England & Wales, however, commented that there are no data available on persons charged with an offence on the police level, only on arrests and cautions. The range of available prosecution data is also limited in some countries. In Poland, for example, there is no breakdown possible by offence type, while in Spain even the statistical counting unit is uncertain.

Court statistics are not *regularly* available in Iceland; they are, however, produced from time to time. In Albania, court data cover only selected sanctions and measures, while in Spain court data only refer to convictions and the sanctions and measures imposed, but provide no information on acquittals and other court disposals. For Switzerland, statistics on probation agencies are lacking, while in Italy only the number of persons assigned to the probation agencies is known. Reconviction statistics are available in eight out of 12 countries, with only Albania, Italy, Spain and Turkey not being able to produce these data. Poland commented that the available reconviction data are poor.

Summing up, one can conclude that in general, the statistical landscape of responding countries is differentiated enough to allow for case flow statistics.

Table 25: Availability of official statistics / statistical databases

	Police	Prosecution	Courts: Convictions	Courts: Sanctions & Measures	Prisons	Probation agencies	Reconviction
Albania	X	X	X	X	X	X	
Finland	X	X	X	X	X	X	X
France	X	X	X	X	X	X	X
Germany	X	X	X	X	X	X	X
Iceland	X	X			X	X	X
Italy	X	X	X	X	X	X	
Netherlands	X	X	X	X	X	X	X
Poland	X	X	X	X	X	X	X
Spain	X	X	X	X	X	X	
Switzerland	X	X	X	X	X		X
Turkey	X	X	X	X	X	X	
UK: E. & W.	X	X	X	X	X	X	X
n	12	12	11	11	12	11	8
in %	100	100	92	92	100	92	67

3.2.2 Possibility to link the statistical data of these statistics / statistical databases (anonymously) with a certain person

The next question asked for the possibility to identify individual, anonymized persons within the statistical databases. Such personal identifiability is usually a prerequisite for case flow statistics, as it may also be used to make a link between different statistics. If, on the other hand, only aggregate data are available in statistics, linkage will be impossible.

Six out of 12 countries (50 %) stated that such linkage is possible. The countries that are able to link data with a certain person are Finland, Iceland, Italy, the Netherlands, Turkey and UK: England & Wales. In Germany, published statistics only include aggregate data. For research purposes, anonymized data files including the individual cases are available. However, these files typically do not include an encrypted personal identifier and can therefore not be linked to a specific individual. An encrypted personal identifier is, however, used in the database on which reconviction statistics are based.

For those countries which are able to link data with a personal identifier, the identifier used is sometimes a case or person number used only for crime and criminal justice statistics, but sometimes it is also the social security number

(Iceland) or the national ID number (Turkey). In the Netherlands, the name, address and birth date of the offender (and in police statistics of the victim as well) are used to make the linkage, i.e. the personal identifiers are not anonymous.

3.2.3 Possibility to link statistical data between the different crime and criminal justice statistics

Of the six countries which were able to identify certain persons in their statistical systems, five countries were also able to link the data between different crime and criminal justice statistics (Italy being the only one not being able to do so), while none of the other countries were able to provide for such linkage. This confirms again that a personal identifier will be necessary to track cases through the system. Indeed, four of the six countries that use personal identifiers in their statistics were also able to make the linkage on the level of individual (not necessarily anonymous)[64] cases, while only in England & Wales such linkage was possible only for aggregate data. In the Netherlands a link between the national victim survey sample and the police data was possible as well.

In Germany it was possible to link only the latest two and at least also the next wave of German reconviction statistics by use of such an encrypted personal identifier. As reconviction statistics are created from the registry of criminal records, it is theoretically also possible to create conviction statistics from the same database and link these with reconviction data. Published court statistics are, however, based on another type of data collection, which cannot be linked.

3.2.4 Possibility to follow selected cases through the criminal justice process

Consequently, the possibility to follow selected cases through the criminal justice process was confirmed for three out of four countries that indicated that they are able to link the statistical data on the level of individual anonymous cases (Finland, Iceland, the Netherlands). The Turkish correspondent was not sure about this, especially due to the fact they did not clearly know how far police data can also be connected to the other statistics. While England & Wales stated for question 3.2.3 (above) that linkage was only possible for aggregate data, the answer to question 3.2.4 indicates that there is an exception from this rule for homicide statistics and for statistics on terrorism-related crimes, where indeed all investigations started in a given year can be followed through the system. This exception is due to the fact that these special statistics are already recorded as an integrated database from the very beginning. Hence,

[64] The Turkish correspondent actually doubted that the linkage would be made for *anonymous* cases. For the Netherlands, the comments made clear that linkage is made by using name, address and birth date.

linkage needs not to be applied later on. In Germany, it was possible to follow only selected convictions to reconviction and on to further reconvictions.

3.2.5 Statistics that can be combined

In Finland, Iceland, the Netherlands and Turkey in principle all existing crime and criminal justice statistics could be linked with each other. There was only an exception for reconviction in Finland and for police statistics in Turkey. Regarding the latter, our correspondent was not sure whether these data are also included in the information system used. In the Netherlands, prosecution and court statistics even shared the same database, thus making combinations automatically possible. In the Netherlands and Turkey, it was also possible to combine the data with data from outside criminal justice (e.g. health or social security statistics). In England and Wales, it was only possible to combine prosecution and court statistics on the one hand and court and reconviction statistics on the other. Apart from that, the separate case flow statistics on homicide and terrorism-related crimes were available (see above). As already discussed above, in Germany there was only the possibility to link convictions with reconvictions and further reconvictions. This linkage can be made by using a database that was built from criminal record data. Official conviction statistics do not allow for such linkage.

3.2.6 Technical implementation of the linkage

Even in those countries where it was possible to link different statistics by means of a personal identifier, such linkage could usually not be made automatically via a statistical data bank system. The only partial exceptions to this rule were the Netherlands with regard to prosecution and court data, which were processed in the same database, England and Wales with regard to the special homicide and terrorism statistics and Germany for the combination of conviction and reconviction data in the database built from criminal record data. For Turkey, the correspondent was not sure about how the linkage is made.

The specific homicide statistics in England & Wales were built on returns made by the investigating authorities to the Home Office for each offence originally recorded as a homicide. An index was created and overall statistics calculated and published. In Finland, linkages were made by Statistics Finland. In the Netherlands prosecution and courts shared a database so everything is already automatically combined (see above). Based on name and address and birth date, it was possible to combine the prosecution and courts database with any other database. Probably, some cases will be lost because of mismatches (spelling errors in the name etc.).

3.2.7 Data access

A last question referred to data access. Typically, linked data are only available to researchers on special application. Four countries confirmed this access possibility (England & Wales, Finland, Germany and the Netherlands). In Finland and Germany, the data were also available to specific administrative bodies outside the criminal justice system, while only England & Wales grants access for the police and for other institutions on application in special cases.

A closer look at who can access the data is possible by examining the countries' comments to the question. England & Wales stated that data are mostly only available to internal ministry researchers who publish statistical bulletins. However, data could be made available to researchers from external providers of programmes to the justice system, for example to be able to monitor whether their programmes are actually reducing the likelihood of reconviction. In Finland, governmental research organizations and statistics authorities may access the data for research or statistics purposes. Access to German reconviction databases was possible for researchers involved in the reconviction statistics project. The Federal Ministry of Justice can commission research on special issues. Other researchers and Länder Ministries of Justice can apply to use the data for research on specific questions. No direct access to databases was granted for those outside the project. In the Netherlands, researchers have to ask for permission and if granted, a link will be made especially for them and only for the duration of research and only with the variables necessary for the specific project. Permission is not granted automatically, but researchers have to motivate their request and explain why this link is absolutely crucial to their research.

A special case was Turkey, where the databases that allow for such linkage can only be accessed by high-level officials at UYAP directly. UYAP (National Judiciary Informatics System) is a central network project that includes all of the courts, public prosecution services, prisons, other judicial institutions and other government departments in Turkey.

3.2.8 Conclusions on the availability of case flow statistics

The results, as shown above in detail, make clear that it is only possible in a small number of European countries to exactly combine person-related data from different sources in the field of crime and criminal justice statistics. Even where this is possible, the linkage does not necessarily cover all parts of the criminal justice process. In Germany, for example, only conviction and reconviction statistics can be combined theoretically. This possible link is, however, not at all useful for measuring *attrition*.

The problems increase if one considers who can access the data by which means. Typically, the data are only available via an application of researchers for specific research purposes. With very few exceptions (e.g. homicide statistics in England & Wales), there are no published case flow statistics in

any of the responding countries. Taking the clear results of the questionnaire on the availability of case flow statistics into account, the group refrained from sending out such a questionnaire to the other countries involved in the project. At the time being, it is impossible to collect true case flow data to measure attrition. Measuring the case flow therefore is only possible by means of specific empirical studies on a number of selected cases (like Lovett & Kelly 2009), but not on the level of national crime and criminal justice statistics. Hence, approximations have to be sought. This is at least true for the comparison of data from different statistics of different actors of the criminal justice process (*inter-level attrition*), but to a lesser extent also for data from the same statistics (*intra-level attrition*). These also do not necessarily have to refer to exactly the same cases or persons, e.g. when comparing the input and output of cases in a given year, because not all cases will be disposed of in the year in which they were received or opened.

3.3 Approximation of attrition

Hence, it was necessary to look for possible indicators that might be used to approximate attrition.

An attrition rate, strictly speaking, is the rate of cases being filtered out between two points in time during the criminal justice process; yet, most publications calculate rates of cases *remaining* within the system (e.g. a *conviction ratio*, see Smit et al. 2012; Jehle 2012; Smit & Harrendorf 2010). The actual attrition rate can be easily obtained from such a ratio. If there is a *conviction ratio* of c, the corresponding *conviction attrition ratio* would be 1 - c. In a strict sense, the word *attrition* can only be used for the latter type of ratios, while the former type might be considered as a kind of survival rate. But these survival rates can also be understood as attrition measures in a wider meaning of this word, as they are directly related to attrition.

3.3.1 Possible indicators

As discussed above, attrition can be found on all levels of the criminal justice process, especially:

1. Cases known to the police per all cases (incl. dark figure of crime; *detection ratio*);

2. Cleared-up cases (i.e.: cases for which an offender can be identified) per all cases known to the police (also called *clearance rate or ratio*);

3. Suspects known to the police per cases known to the police (*offender ratio*, see Smit et al. 2012);

4. Suspects (or cases) passed on to the prosecution service per suspects (or cases) known to the police (*prosecution ratio*);

5. Persons (or cases) brought before a court by the prosecution service per output of persons (or cases) prosecuted (*indictment ratio 1*);

6. Persons (or cases) brought before a court by the prosecution service per suspects (or cases) known to the police (*indictment ratio 2*);

7. Persons convicted (or cases leading to a conviction) per persons (or cases) brought before a court (*conviction ratio 1*);

8. As a "shortcut", leaving out the prosecutorial stage, persons convicted (or cases leading to a conviction) per suspects (or cases) known to the police (*conviction ratio 2*, see Smit et al. 2012; Jehle 2012; Smit & Harrendorf 2010);

9. Persons sentenced to a certain, severe sanction (typically an unsuspended custodial sentence) per all convicted persons, or the same ratio for cases; this might be called *punitivity ratio 1* (see Harrendorf 2011);

10. Prison flow, i.e. all persons sent to prison in a given year, per all convicted persons (also possible to be identified as *punitivity ratio 2*);

11. Prison stock, i.e. all persons incarcerated (or sentenced incarcerated persons) per all convicted persons; this might be seen as *punitivity ratio 3* (see Harrendorf 2011; Smit et al. 2012).

12. Other combinations of the above (e.g. input as in 4 and output as in 9) are theoretically possible, too.

3.3.2 Assessment of indicators

3.3.2.1 Attrition at police level

One could speak of attrition at police level with regard to the *detection ratio*, *clearance ratio* and *offender ratio*, as defined in the above list (rates 1 to 3).

It is impossible to calculate a *detection ratio* using ESB data. Strictly speaking, this is no attrition ratio at all, as this sort of "attrition" appears before the criminal justice institutions even start to work on a case. For offences that are noticed by *victims*, reporting rates from victim surveys (like v.Dijk, v. Kesteren & Smit 2007) could be used as a proxy for this rate. For offences the *offenders* are aware of, self-reported delinquency surveys (see, for example, Junger-Tas et al. 2012) might be used to calculate the ratio between offences known to the police and all offences admitted by an offender. Offences that go completely unnoticed (which might especially be the case for some negligent offences) cannot at all be taken into account.

Sourcebook data does also not allow for the calculation of a *clearance rate* (ratio 2 of the above list), as data on cleared offences is not collected. It would,

however, be possible to expand data collection on cleared cases in later editions, as these data are often available in national statistics. However, as was shown in Smit et al. (2004), the clearance rate[65] is not without its own problems when used for comparing countries. For the time being, clearance rates can only be approximated by calculating the ratio of suspects by offences on police level (ratio 3). This *offender ratio* is only a rough approximation, since suspects might have committed several offences and an offence might have been committed by several offenders, thus leading to disparities in counting units. As a consequence, for offences with high clearance rates and comparatively high complicity levels, like homicide and robbery, offender ratios of greater than 100 % (i.e.: a buildup or negative attrition) may occur. The *offender ratio* is an *intra-level* attrition rate.

3.3.2.2 Attrition on prosecution level

Attrition ratios focusing on the loss of cases on prosecution level are the *prosecution ratio* and the two *indictment ratios* defined above (ratio 4, 5 and 6 of the list). The *indictment ratios* (5 and 6) could be calculated for each offence type. In principle, the available counting unit would be the case for ratio 5. Ratio 6 could only be calculated following a mixed model. In addition, ratio 4 can be calculated for the total of cases. A mixed model would need to be applied, again.

There are, however, important shortcomings with respect to these ratios.

First of all, for ratios 4 and 6 there would be the problem of changing counting units, which might render the results obtained problematic.

In the ESB for data on suspects and convictions, the *person* is used as a counting unit, while the preferred counting unit on prosecution level is the *case*. The *case* is, however, defined as *proceedings relating to one person only.* This comes close to the *person* count, if one considers that person-related data on police and conviction level are usually additionally defined by the case, thus resulting in a person being recorded twice in statistics if the person commits several criminal acts that are processed separately.

According to the results of the 5th edition questionnaire, for almost three quarters of all responding countries (21 out of 29) suspects are (or at least can be) counted twice or more if they committed several separate offences in the same year. For persons convicted, this is even true for almost 90 % of all responding countries (30 out of 35). These answers come close to what is meant by *case* count on prosecution level. Answers for prosecution data do, however, reveal that the general rule to provide *case* count can only be fulfilled by 8 out of 31 countries (26 %), while 5 countries (16 %) provide *persons* count and another 18 (58 %) *proceedings* count, which might combine several offences and several persons. This makes the comparability of data

[65] Although called "detection rate" in Smit et al. (2004), it really is the ratio nr. 2 as described here.

questionable. On the other hand, it has to be considered that the majority of proceedings will still only refer to one person, as there are many offences where complicity is a rare occurrence.

There are, however, some additional problems connected to prosecution data. The first is that in prosecution output data, cases dropped because the offender remained unknown are included in the majority of countries responding to the 5th edition survey. When unknown offenders are included, the total number of proceedings on prosecution level will easily exceed the number of suspects found on police level. Regardless of this effect, the inclusion of unknown offenders makes comparison with the number of suspects from police level impossible. In addition, a vast majority of countries include "other disposals" in their output data, which, inter alia, involve disposals due to lack of competence or transfer to another domestic authority. Such cases can, however, reappear in a given year, when the case is (re-)opened by the competent authority or is taken over by another domestic authority. It is also not easily possible to deduct the problematic subcategories from the total output, since many countries cannot provide figures for these subcategories. For example, only half of the countries that include proceedings relating to unknown offenders in their data are able to give the number of such proceedings.

Comparable problems will occur for input data. Here, almost three quarters of all responding countries include unknown offenders. This difference can be explained as follows. Apart from dropping cases due to the offender being unknown, another possibility is to keep the file open and wait for an offender to be found until the limitation period is over, when the case will be dropped for that reason.

Finally, *cases brought before a court* is not necessarily the only disposal category that can lead to a conviction. The same is in principle true for the category *sanctions imposed by the prosecutor (or by the court, but on application of the prosecutor and without a formal court hearing) that lead to a formal verdict and count as a conviction*. According to the 5th edition ESB survey, more than half of all responding countries know such sanctions and include them in their data on prosecution and conviction. However, not all of these countries are able to provide separate figures for this category on prosecution level. In addition, differently from the category of *cases brought before a court,* the ESB survey did not collect the data for prosecutorial sanctions by offence. Hence, it would be possible to add this category only to the number of *cases brought before a court* for the total of offences.

The only attrition-related ratio on prosecution level that avoids all these problems is *indictment ratio 1* (ratio 5 of the above list), since it is a rate that refers only to data recorded on prosecution level. It is an *intra-level* attrition rate. It can be discussed whether prosecutorial sanctions that count as a conviction should be included in the indictment ratio. For the time being, however, this would only be possible for the total of offences, since offence-related data are only available for the total prosecutorial output and the number of *cases brought before a court*.

3.3.2.3 Attrition on court level

Attrition on court level could be measured by the two different *conviction ratios* and the first *punitivity ratio* defined above (ratios 7 to 9 of the list). All of them could be calculated for each offence type. In principle, the available counting unit would be the person for ratios 8 and 9. Ratio 7 could only be calculated following a mixed model.

Ratio 7 relies on prosecution data. Hence, the shortcomings discussed above fully apply here, too. *Punitivity ratio 1* (ratio 9) is an *intra-level* attrition rate, like ratios 3 and 5. There are no evident problems connected with it. *Conviction ratio 2* (ratio 8), on the other hand, is an *inter-level* attrition rate. Therefore, all the general problems of comparability of data that were recorded in different statistics during the same year apply here, too (see 3.1).

3.3.2.4 Attrition on prison level

Finally, attrition on prison level could be measured by the two remaining *punitivity ratios* defined above (ratios 10 and 11 of the list). Only ratio 11 – provided the ratio is calculated using sentenced prisoners only and leaving out pre-trial detainees – could be calculated for each offence type. The available counting unit would be the person for both ratios.

Ratio 10 is not so much different from ratio 9, if the latter is calculated for unsuspended prison sentences. On the other hand, its interpretation is far more difficult, as at least each change of status of a prisoner will often be counted as a new entry (e.g. when being sent from pre-trial detention to a prison for sentenced prisoners). Apart from that, ESB data collected for the upcoming 5th edition show that there are even countries which include the following in their prison flow data:

- Any entry following a transfer from one penal institution to another in the same country;

- Any entry following the detainee's removal from the institution in order to appear before a judicial authority;

- Any entry following a prison leave or a period of absence by permission;

- Any entry following an escape, after re-arrest by the police.

Hence, it is not very useful to use ratio 10 in this context.

Ratio 11 is even more problematic with a view to attrition. These problems relate to the fact that the number of convictions is counted as an output flow, e.g. all convictions issued in a given year. Prison stock, however, refers to the number of persons in prison at a given date. Due to this disparity of counting units, the ratio of both cannot be understood as a measure for attrition (notwithstanding that it could be used as a punitivity measure, see Harrendorf 2011 and 2013, Smit et al. 2012).

3.3.2.5 Attrition and the total of offences

It is problematic to rely on the total of criminal offences when calculating attrition rates. The total of offences is a black box with respect to offences covered therein. This is not only problematic when comparing results between countries, but also when comparing results between different stages of the criminal justice process in the same country. There are, for example, some countries which do not include major traffic offences in their police data. Of those countries that exclude major traffic offences on police level, almost all *include* them on the other levels of the criminal justice process. Some other countries even *include* minor traffic offences on these higher levels. There are also several countries which include breaches of public order regulations in their conviction (and probably also prosecution) data, while excluding it from police data. And finally, there are also other types of offences which are in some countries not investigated by the police, but by specialized administrative units etc., e.g. tax and customs offences. Such offences then also do not appear on police level. As the categories discussed here will have a significant impact on the total number of recorded crimes, the total of offences should not be used to calculate attrition rates between the police level and other levels.

3.4 Final assessment

Attrition appears throughout the criminal justice process. Therefore, it would not be a good idea to move straight from the first to the last stage and compute, for example, the ratio of prison sentences by police-recorded offences. In doing so, important information will be lost. Therefore, in measuring attrition, other combinations (no. 12) than those discussed above in detail are not useful to select. Attrition should best be calculated level by level. Inter-level attrition ratios should also only be calculated for specific offences, in particular when using the police level.

Several possible attrition ratios were discussed above. Many of these were problematic with regard to the comparability of definitions and counting units used. We should refrain from using ratios 4, 6, 7, 10 and 11, while ratio 3 should only be used carefully. Of the two different indictment ratios, only *indictment ratio 1* turned out to be useful. The same is true for *conviction ratio 2* among conviction ratios and *punitivity ratio 1* among punitivity ratios. The other rates being unfeasible, the index number can be left out from here on. Hence, there are four possible attrition measures available in ESB data, one *inter-level* attrition ratio and three *intra-level* attrition ratios: *offender ratio* on police level, the *indictment ratio* on prosecution level and the *punitivity ratio* on court level. The inter-level ratio is the *conviction ratio*, measuring attrition between police-recorded suspects and convicted persons, with the restriction that this ratio should not be used for total crime, but for specific offence types only. Table 26 summarizes the results.

Table 26: ESB measures of attrition

Name	Type	Level	Definition
Offender ratio	Intra-level	Police	Suspects per recorded offences
Indictment ratio	Intra-level	Prosecution	Indictments per total output
Punitivity ratio	Intra-level	Courts	Persons convicted to unsuspended prison sentences per total persons convicted
Conviction ratio	Inter-level	Courts by police	Convicted persons per suspects

Another issue is the possibility to construct attrition chains, i.e. to combine several measures of attrition. Due to the severe comparability issues discussed above, the *indictment ratio* should be kept out of such a chain. The only possible attrition chain that could be built using ESB data is therefore the one shown in figure 1.

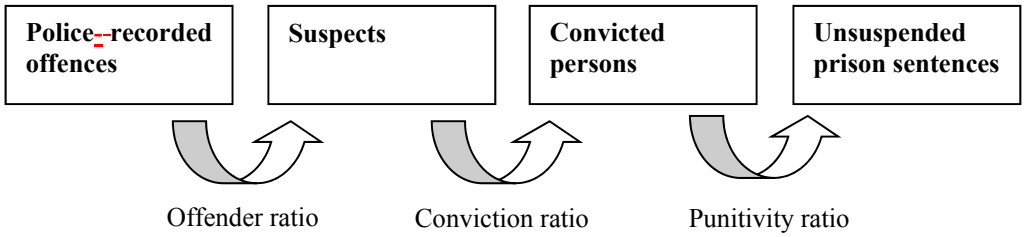

Figure 1: ESB attrition chain

3.5 Presentation of attrition

Examples for the visualization and presentation of attrition data can be found, inter alia, in the publications of Jehle (2012), Smit et al. (2012), Smit & Harrendorf (2010), Smit 2008, Tonry & Farrington 2005, Mayhew 2003 and Marshall 1998. In the following, we will show examples based on the way results are presented in Jehle 2012 and Smit & Harrendorf (2010).

Figure 2 shows the attrition chain for robbery data in 2010, based on the data of the 5th survey. Instead of providing results for a specific country, the medians and means for the rates of offences, suspects, convictions and unsuspended prison sentences per 100,000 population are shown. Medians and means were only calculated for those 13 countries[66] that were able to provide data for all four items (police-recorded offences, suspects, convicted persons, unsuspended prison sentences).

[66] The countries are: Bulgaria, Croatia, Czech Republic, Finland, Germany, Hungary, Netherlands, Poland, Portugal, Serbia, Slovenia, Sweden, and Ukraine.

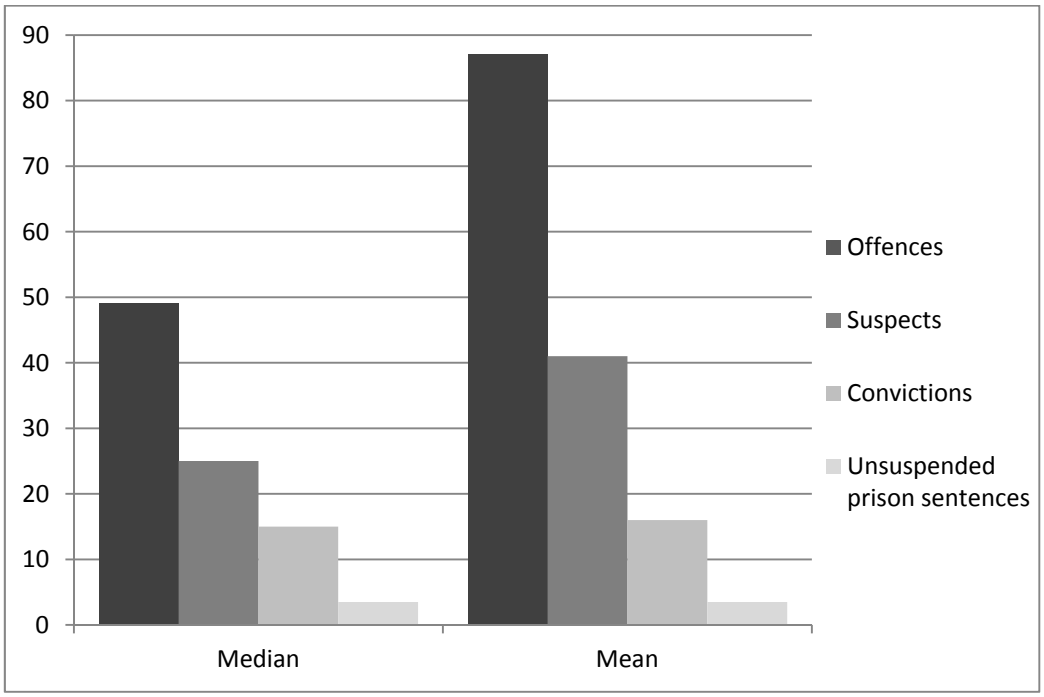

Figure 2: Attrition process for robbery in 2010 (rates per 100,000 population; median and mean)

Figure 3 shows the attrition chain for the total of theft, for adults and minors separately. Since there is no distinction between adults and minors possible for recorded offences this indicator was left out of the graph. In the figure the total absolute numbers are given (instead of means and medians) for the 11 countries[67] that provided figures for all three remaining indicators.

Table 27 shows the respective *offender, conviction* and *punitivity ratios*. For robbery and theft this is another representation compared to figures 2 and 3, the figures for rape are added for this table and refer to 16 countries[68] that provided figures.

[67] The countries are: Austria, Croatia, Czech Republic, Finland, Germany, Hungary, Netherlands, Poland, Slovenia, Sweden and Ukraine.

[68] The countries are: Austria, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Hungary, Lithuania, Netherlands, Poland, Portugal, Serbia, Slovenia, Sweden, and Ukraine.

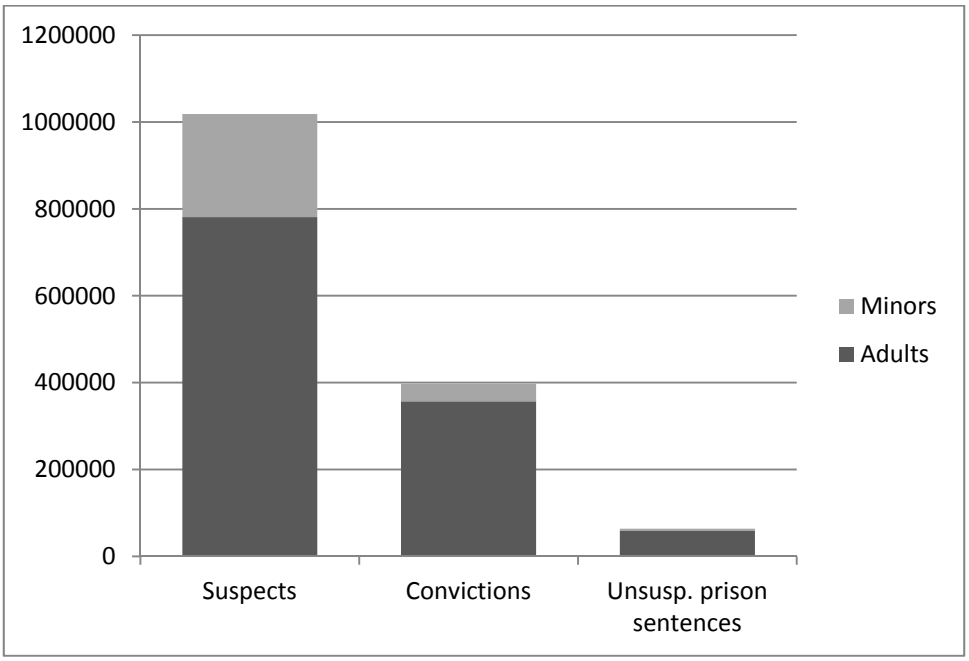

Figure 3: Attrition process for the total of theft in 2010, total number for 11 countries, adults and minors

Table 27: Attrition ratios for robbery, rape, theft (all offenders) and theft (minors) in 2010 (median and mean)

		Offender ratio *Suspects per recorded cases*	**Conviction ratio** *Convicted persons per suspects*	**Punitivity ratio** *Persons convicted to unsuspended prison sentences per all persons convicted*
Robbery	**Median**	50%	63%	24%
	Mean	47%	41%	23%
Rape	**Median**	68%	50%	53%
	Mean	52%	34%	70%
Theft (all)	**Median**	18%	39%	20%
	Mean	21%	43%	16%
Theft (minors)	**Median**	not applicable	22%	7%
	Mean	not applicable	22%	5%

This kind of presentation of attrition results is – of course – also possible for other offences covered in the ESB. Data could also be presented on the level of individual countries, which could be compared based on the different structure of their attrition process. A typical result of such country comparison (cf., for example, Jehle 2012) is already suggested by the above data, where the relative differences between median and mean are large for police-recorded offences

and suspects, but smaller for convictions and unsuspended prison sentences. Indeed there are typically significant differences in the rates of police-recorded offences and suspects per 100,000 inhabitants, but these differences are strongly reduced on the level of convictions, where the resulting rates are often quite close to each other. Hence, differing attrition processes result in quite comparable conviction and imprisonment rates per 100,000 population. Also, the differences between offence types are obvious, with high punitivity ratios for rape and low offender and punitivity ratios for theft. And both from table 27 and figure 3 it is obvious that the attrition for minors is much higher than for adults.

3.6 Conclusions

Attrition, being the filtering out of cases during the criminal justice process, can be measured by following individual cases through the system. However, after researching the statistical systems in 12 countries it turned out that only a limited number of countries are able to provide these kind of flow statistics because not many statistics on the different levels in the criminal justice system can be combined. And even where flow statistics are possible they are not regularly made and publicly available.

Another method to quantify the attrition process is to identify a number of indicators such as “clearance rate”, “conviction rate” etc. that make an approximation for attrition possible on an aggregate level. In particular four indicators are useful and can be computed using ESB data: the *offender ratio*, the *indictment ratio*, the *punitivity ratio*, and the *conviction ratio*. These ratios should mainly be used for specific offence types. The use of “total crime” is problematic, in particular for the *conviction ratio*. To cover the attrition for the whole criminal justice system a chain of three indicators can be used: the *offender ratio*, the *conviction ratio*, and the *punitivity ratio*.