Estrada, F. (2006): Trends in violence in Scandinavia according to different indicators.

British Journal of Criminology, 46: 486-504. [1]

Abstract[2]

In Scandinavia as in many other parts of Europe, violence constitutes an important focus for the public and political debate on crime. Much of what is said in the public debate, and done in the field of criminal policy, stems from a perception that violence is on the increase. This paper presents a new social indicator of trends in violence – Swedish hospital admissions resulting from acts of violence – and evaluates this measure in the light of more traditional indicators of violence – crime statistics, victim surveys and homicide statistics. The hospital data comprise 90,000 admissions from the years 1974-2002. The results show that admissions caused by violence are more numerous in the 1970s and 1990s and fewer in the 1980s. Nothing in the hospital data indicates an increase in hospital admissions resulting from serious violent incidents over this period. No increase is noted in either fractures or knife and gunshot wounds. Thus the continuous upward trend noted in crime statistics is not verified. Instead the hospital data serve to verify the more stable trends indicated by victim surveys and lethal violence statistics.

[1] The author would like to thank David Shannon for his translation of the text.

[2] This article constitutes an abbreviated version of a report (Estrada 2005). The report includes a more comprehensive description of the material and its associated sources of error. Furthermore, several references to works published in the Nordic languages have been excluded from this article.

The media and political debates on trends in violence have long presented a picture of a continuously increasing trend in violent crime (Hall et al. 1978; Beckett 1997; Estrada 2001, 2004). Violence is also presented as becoming increasingly serious, not least due to an increased use of weapons. Analyses of trends in violence conducted within the research community present a more varied picture however. Specifying the extent of violent crime is no easy task. There is a variation across different groups and different situations as regards the question of whether an act occurring in a certain situation should be regarded as violence or as involving a threat of violence. On a more or less daily basis, police, health-service practitioners and home-help staff are exposed to incidents that would in other circumstances be viewed as violent or threatening behaviour, but which are instead regarded as 'part of the job' (Åkerström 2002). Perceptions as to what constitutes violence are also subject to change over time. Over recent decades our societies have undergone a marked shift involving both a greater sensitivity regarding what is perceived to constitute violence and changes in the view of how violence should be controlled (Åkerström 1998; Balvig 2000; von Hofer 2000; Estrada 2001). This has manifested itself not least in the legislation, where a large number of violent acts that were not previously subject to penal law have become criminalised. In Sweden, for example, rape within the family was criminalised in 1965 and the corporal punishment of children was criminalised in 1979 (von Hofer 2000:62). This means that assessments of the extent of and trends in violence must work with a number of different indicators, categorisations and definitions. As a rule-of-thumb, researchers agree that the less serious the violence in question, the more difficult it is to correctly determine its extent and associated trends over time.

This article presents an indicator of trends in violence that has to date been under-exploited by criminologists. It relates to victims of violent acts admitted for hospital treatment between 1974 and 2002 (cf. Brink et al. 1997; Wladis et al. 1999; Wittebrood & Junger 2002 and Sivarajasingam et al. 2003 for analyses of similar data in Denmark, Sweden, England and Wales and Holland respectively). Naturally, this indicator is no more *perfect* a measure than any of the other indicators of societal violence. Registered hospital admissions resulting from violence include only a fraction of the violent acts that actually occur and undoubtedly primarily those that could be characterised as serious physical assault. Thus in principle other types of violence – threatening behaviour, mugging, violence against public servants and not least sexual violence – are excluded from the analysis to the extent that they do not result in a hospital admission. The advantages associated with an indicator of the number of treated

injuries resulting from violence are obvious however (Sutherland et al 2002; Sivarajasingam et al. 2003). It provides us with an additional measure that can be compared and evaluated together with those that already exist. Further, hospital admissions constitute a measure that is not directly determined by conceptions of violence and of how it should be controlled, nor by the propensity to report an event to the police – with all that this involves for the victim.

Trends in violence in Scandinavia – the traditional indicators

Crime statistics: a substantial increase in reported violent offences

The picture of trends in violence that emerges from crime statistics is fairly unequivocal across the Scandinavian countries – levels of violence have increased. And this is true over both the short and the longer term (Westfelt 2001:66; von Hofer 2003, 2004; Westfelt & Estrada 2005). Looking at the period covered by the current article, i.e. 1974-2002, crime statistics indicate a near continuous increase in the number of assaults reported to the police. It is far from self-evident how this trend should be interpreted, however, since assault statistics are sensitive to shifting perceptions of what constitutes an act of violence and of how such acts should be controlled. Analyses of the attention focused on crime over recent decades clearly show that violent crime has become a central issue for the media, public sector agencies and political parties alike (Åkerström 1998; Estrada 2001, 2004; Andersson 2002; Balvig 2004). This research concludes that it is likely that the range of acts viewed as sufficiently serious to warrant reporting them to the police has expanded. Given widespread agreement that crime statistics do not constitute a direct reflection of trends in violent crime, but can rather be characterised as a "social product" – acts that are not defined or perceived as criminal and thereafter also reported will never find their way into official crime statistics (see e.g. Coleman & Moynihan 1996) – the content of crime statistics should be compared with other sources.

Victim surveys: some shift in the level of violence but no continual increase

Despite a number of documented problems such as selective attrition, difficulties in studying certain offence types and under- and over-reporting (e.g. Coleman & Moynihan 1996) victim surveys are less affected than crime statistics by shifts in levels of tolerance towards violence. At the same time, it must be noted that an increased sensitivity to the use of violence may nonetheless exert an effect on respondents' propensities to report violent victimisation. In

cases where respondents report exposure to more serious violence resulting in unequivocal consequences, changes in perceptions of violence probably constitute less of a problem. Victimisation studies commonly present the proportion of those interviewed who report victimisation. The number of times respondents report being victimised may also be presented. One advantage with this latter method is that it provides a better basis for conducting comparisons with statistics on assaults reported to the police. The disadvantage, however, is that calculations of the number of incidents are subject to more serious methodological problems. Similarly, the type of violence being studied also affects the findings. Violence where victims report having been victimised several times over the course of a year primarily takes place in relation to the victims' work.

The substantial increase in violent crime shown by crime statistics has not been substantiated by any of the victim surveys conducted in Scandinavia if one looks to the number of persons victimised (Balvig 2000; Stene 2003; Häll 2004; Heiskanen et al. 2004; Westfelt & Estrada 2005). It is worth noting, however, that surveys from a number of countries show increases in levels of exposure to work-related threats or violence whereas levels of more serious street violence remain stable, or have even undergone a decline over the past ten to fifteen years.

Cause-of-death statistics: stable levels

Cause-of-death statistics are commonly viewed as a relatively valid indicator since compared with other forms of violence, the dark figure of lethal violence is considerably lower (Doob & Sprott 1998; O'Brien 2003). On the basis of the groups who primarily fall victim to lethal violence, trends ought perhaps primarily to be seen as an indicator of the more serious violence that occurs among disadvantaged groups, which tend to be underrepresented in victim surveys (Rying 2000). It should be noted however that when viewed from a historical perspective, there is nonetheless a clear correlation between the numbers of cases of lethal violence and convictions for assault (von Hofer 2000, 2003; cf. O'Brien 2003).

Cause-of-death statistics show that lethal violence has not increased in the Nordic countries over recent decades (Balvig 2000:72; Westfelt 2001:68; von Hofer 2004; Westfelt & Estrada 2005). This is usually interpreted as indicating that the most serious forms of violence have not increased over recent years. An interesting alternative hypothesis, however, is that this stability is primarily a consequence of improved healthcare practice, whereby the survival rate

among those suffering the most serious violence-related injuries has increased (Doerner 1988). According to Harris et al. (2002), the number of homicides in the USA at the end of the 1990s would have been three times as high (45,000-70,000 instead of 15,000 -20,000) were it not for improvements in the healthcare sector. This assumption is based on the increase in the gap between the number of reported assaults and the number of cases of lethal violence. What Harris et al. do not show, however, is the trend in the actual number of hospital admissions resulting from violence in the USA, which would of course constitute the most suitable means of studying the hypothesis of an increase in the significance of healthcare practice. The present article provides an opportunity to examine trends in hospital admissions resulting from violence, and does so over a period during which the trends in lethal violence and reported assaults follow the same divergent pattern as constitutes the basis for the arguments of Harris et al. Finally, the fact that the material employed does not come from the USA, which otherwise dominates this type of research, should be viewed as being of particular value.

The Swedish Hospital Discharge Register

Since 1968, Sweden has maintained a Hospital discharge register (HDR - *Patientregistret*[3]) covering persons *admitted* to public hospitals, i.e. those subject to what is commonly termed in-patient care, but this register did not cover the entire country until 1987. All patients seeking treatment and admitted to a hospital are registered as to their personal identity number, sex, age and the length of their stay in hospital. All injuries treated by means of in-patient care are in addition to be assigned a diagnosis describing the nature of the injury and also an additional code describing the cause of the injury or illness. This latter variable is known as the E-code, and it is on the basis of this that violent incidents are identified. Since 1997, the categorisation of E-codes has been employed in accordance with the international ICD-10 classification. Prior to this, the ICD-8 (1968-86) and ICD-9 (1987-96) classifications were used. Substantial shifts occurring with respect to individual diagnoses in connection with these changes in the register's classification system (which occurred in 1987 and 1997 respectively) should be interpreted with caution.

[3] The register is administered by the Centre for Epidemiology (*EpC - Epidemiologiskt centrum*), at the National Board of Health and Welfare (*Socialstyrelsen*). A more detailed description of the data and various associated sources of error have been published in Estrada 2005, which is available from the author on request.

One important source of error affecting the HDR's capacity to function as an indicator of trends in violence is found in changes in treatment practice affecting whether patients are treated as in-patients or out-patients. Individuals exposed to violence who are only treated in hospital emergency rooms, out-patient care, healthcare clinics or GP's surgeries, school nurses, dentists etc. are *not* included in these statistics to the extent that the treatment did not result in an admission. As of today there are no reliable data as to the size of this dark figure. Analyses of *all* forms of treatment resulting from leisure time accidents show however that approximately one in seven injuries (14%) resulted in a hospital admission and that the proportion of admissions was markedly higher for those involving serious consequences for the victim. Similar figures can be found in local studies of violence related injuries from hospitals in Stockholm. 13 percent of patients seeking medical attention after being exposed to violence had to be admitted to the hospital and of those who had stab wounds 40 percent were admitted (Wladis 1999; Boström et al 2000).

One way of examining to what extent there may have been changes in the likelihood that a violent injury would result in in-patient or out-patient care involves looking at the total number of registered admissions to in-patient care. Between 1974 and 1994, there was a substantial increase in the number of registered *in-patient admissions* (from 900,000 to 1.7 million per annum), thereafter the number diminished somewhat, and during the first years of the 21st century, the annual number of reported admissions has been stable at around 1.5 million. It is worth noting that the mean length of in-patient care times has dropped substantially over this period. Thus up until the mid-1990s, a continuously increasing number of patients were admitted to in-patient care, a trend which was in part made possible by the resources freed-up by shorter care times. This means that trends in the length of stay in in-patient care and the number of admissions should be viewed as separate phenomena. Given the arguments put forward as to the significance of the increased availability of healthcare for the trends in lethal violence (Harris et al. 2002), it is interesting to note that in Sweden as well as in England and Wales (Sivarajasingam et al. 2001:106), patients admitted for violent injuries comprise a very small proportion (approximately two percent) of those in hospital care.

There is also a problem relating to missing data within the HDR. Missing data in relation to sex, age, length of stay and diagnosis lie at under one per cent. Information on how an injury arose (i.e. the E-code) is missing in relation to approximately five per cent of admissions.

Much of this missing data is due to poor reporting by a small number of county councils during the years 1974-5, 1984-6 and 1997-2000. In order to counteract the effects of variations in this missing data, the analyses employ weighted data. The weighting procedure employed assumes that there are no systematic differences between cases where an E-code has been registered, and those where this code is missing, an assumption supported by the similarities between years with low levels of missing data and chronologically proximate years with higher levels of missing data (Estrada 2005). As with other registers, there is a degree of uncertainty associated with the coding of data in the HDR. Violent injuries may be coded as being of uncertain origin or as self-inflicted, which may result in under-reporting. Nor can the possibility of an increase over time in the level of reporting be excluded. The increase in the level of attention focused on violence and an increased awareness of its consequences may have resulted in greater efforts to correctly classify injuries resulting from violent acts.

The Data

The analysis of trends in violence is based on those regions that have reported data to the HDR since 1974. This sample accounts for a large proportion of the total number of violent incidents recorded during years for which data are available from all regions of Sweden (i.e. 1987-2002) and it is therefore judged to be representative for the country as a whole. The data drawn from the HDR comprise all *admissions* (and thus not the number of patients) involving an injury caused by intentional acts of violence. The victims so injured have been registered in connection with a wide variety of diagnoses. The article therefore only presents a small sample of all these diagnoses. The goal has been to differentiate a number of unequivocal categories reflecting injuries sufficiently serious to make it highly likely that they will have required extensive treatment and thus also an in-patient admission, irrespective of treatment ideology, technological developments and organisational forms. This categorisation differentiates between five types of violent injuries. The first two categories comprise injuries caused by guns or knives. The third comprises the single most common diagnosis, namely concussion. The fourth comprises acts of violence resulting in fractures (e.g. to the nose, jaw, ribs, arms), i.e. what may be viewed as serious physical consequences of non weapon-related violence (Wladis et al. 1999). Injuries not covered by these four categories have been grouped together in a fifth. This therefore includes a variety of injuries, both relatively superficial (bruising) and cuts but also more serious injuries to internal organs. These “other injuries”

may therefore be seen as constituting a relatively heterogeneous but at the same time relatively 'average' group as regards seriousness and treatment needs.

Violent injuries resulting in hospital admissions

Basic data on violent injuries from the Hospital discharge register

Prior to analysing trends over time, the presentation focuses on the aggregate data available from the HDR during the period 1968-2002. The factors that can be described comprise the sex and age of the victims, length of hospital-stay and the seriousness of the violence in terms of the presence of a weapon and the diagnosed injury. This allows for the presentation of a general picture of the violent incidents resulting in in-patient treatment in Sweden. This picture will then be compared with other available indicators of violence in order to illustrate in more detail the types of violence that dominate the contents of the HDR.

Sex and age

Between 1968 and 2002, 89,760 admissions resulting from assaults and other violent incidents were recorded in the HDR. Seventy-seven percent of these admissions involved male victims, and 23 percent female. Victim surveys present a somewhat more even sex distribution in relation to violence *or threatening behaviour* (Estrada & Nilsson 2004). Female victimisation is more often associated with the *threat of violence* in the home or at work however, i.e. with acts that will not be visible in the HDR (Estrada & Nilsson 2004:173). If the focus is instead directed at the proportions reporting exposure to violence resulting in a healthcare treatment, the distribution is more similar to that noted in the HDR. Between 1988 and 1999, men comprised approximately 70 percent of those reporting violent victimisation of this kind (ibid). The sex difference in more serious violence is also confirmed by the pattern found in relation to lethal violence. Approximately 2/3 of Sweden's homicide victims are men, with the majority of these being killed by a non-family member. Among women victims, the perpetrator is most commonly a family member (Rying 2000). The median age of hospitalised victims is 31 years, and over half are between sixteen and 34 years old. Female victimisation is more evenly distributed over the life-cycle, whereas male victimisation presents a clear peak at around twenty years of age. This pattern corresponds well with victim survey data on exposure to violence requiring healthcare treatment (Häll

2004:42). Thus at the aggregate level, other available data sources confirm the essential patterns relating to victim characteristics noted in the HDR. The sex and age distribution is also very similar to the ones found in hospital data in England and Wales (Sivarajasingam et al. 2003:224).

Length of hospital stay and the seriousness of injuries

On average, a violent injury recorded in the HDR has resulted in a four-day stay in hospital (median two days), which suggests that the violence included in the register is of a serious nature. It is notable, however, that in almost one-fifth of cases (16,535 admissions) the patient has been admitted and discharged on the same day. The seriousness of the violence suffered by hospitalised victims may be studied partly by focusing on the prevalence of injuries resulting from knife and gun wounds and partly by an analysis of the diagnoses recorded in connection with injuries. Between 1968 and 2002, 7,108 admission-injuries resulted from the use of weapons (primarily knives). Thus the use of weapons is relatively uncommon among violent incidents leading to hospitalisation in Sweden (see also Boström et al. 1999, 2000). Injuries caused by weapons involve significantly longer stays in hospital than other violent incidents. On average, shooting victims spend twice as long in hospital as victims of unarmed assaults (7.3 days as against 3.7). Knifing victims are located between these two positions (4.8 days in hospital).

Table 1 presents the violent incidents included in the study categorised by seriousness. Substantial differences in hospitalisation times are apparent in relation to different types of injury. Incidents where the victim has been concussed result in relatively short periods of hospitalisation, and at the same time comprise a large proportion of the incidents resulting in admissions (28%). As already noted, shooting injuries result in the longest stays in hospital, but are also uncommon. Violence resulting in fractures (32 %) requires approximately the same period of hospitalisation as knife wounds. This is the case more or less irrespective of the victim's age-group, although fractures tend to require longer periods of hospitalisation for the oldest victims (who are relatively few in number however). Incidents falling within the broad "other injuries" category require a somewhat shorter hospitalisation time than knife wounds and fractures, but a significantly longer one than concussions.

Table 1. Violent incidents included in the Hospital discharge register, by seriousness, victim's sex, and hospitalisation times (mean number of days). 1968-2002. Sweden.

	Concussion	Fractures	Knife wounds	Gunshot wounds	Other injuries
Hospital time	1.5	5.2	4.8	7.3	4.3
Proportion men	79	81	86	77	68
(row%)	(29)	(34)	(8)	(1)	(28)
Proportion women	21	19	14	23	32
(row%)	(25)	(27)	(4)	(1)	(43)
Median age	28	32	32	32	32
Total (%)	25,293 (28)	28,891 (32)	6,169 (7)	939 (1)	28,468 (32)

Trends 1974-2002

The general trend

Figure 1 presents the trend in the number of registered violent incidents. The number of violent injuries resulting in hospitalisation increases between 1974 and 1979. There then follows a sharp decrease, and for more or less the entire 1980s, the number of violent incidents treated remains stable at a lower level than previously. At the end of the 1980s, the number of incidents begins to increase however, and a marked increase occurs during the early 1990s reaching the levels witnessed during the latter 1970s. There is a clear break in this trend subsequent to 1997. Between 1998 and 2002 the level remains stable but at a considerably lower level than that of the early 1990s. The question that must now be examined is to what extent this trend may be regarded as an acceptable indicator of the trend in serious violence in Sweden.

Figure 1. Number of violent incidents recorded in the Hospital discharge register, 1974-2002. Sweden.

For the purposes of interpreting the trends noted in the HDR, it would be interesting to see whether there are groups for whom the trend over time deviates from that presented above. As was noted earlier, different social groups fall victim to different forms of violence. Were the trend found to be the same for all such groups, then, this could be interpreted as indicating the presence of a systematic source of error regarding the trend in the number of admissions registered in the HDR. If this were the case, the changes noted over time might primarily be a result of the capacity of the health-care sector to admit patients, for example, or of the statistical production process, and not of the "supply" of victims of violence. If on the other hand there are clear differences between the trends within different groups, e.g. with some increasing whilst others remain stable or decline, this would indicate that the statistics have succeeded in reflecting actual changes in the extent of the violence experienced by different groups. An alternative interpretation of such differences, however, might be that they are primarily a reflection of shifting priorities.

Sex

Generally speaking, the main trend is similar for men and women – higher levels at the end of the 1970s and during the early 1990s, and lower levels during the 1980s. At the same time, it

should be noted that with the exception of two peaks, in 1978 and 1994, the trend among women is fairly stable. The substantial variations noted in the material as a whole are therefore a result of powerful fluctuations between different periods in the number of male hospital admissions.

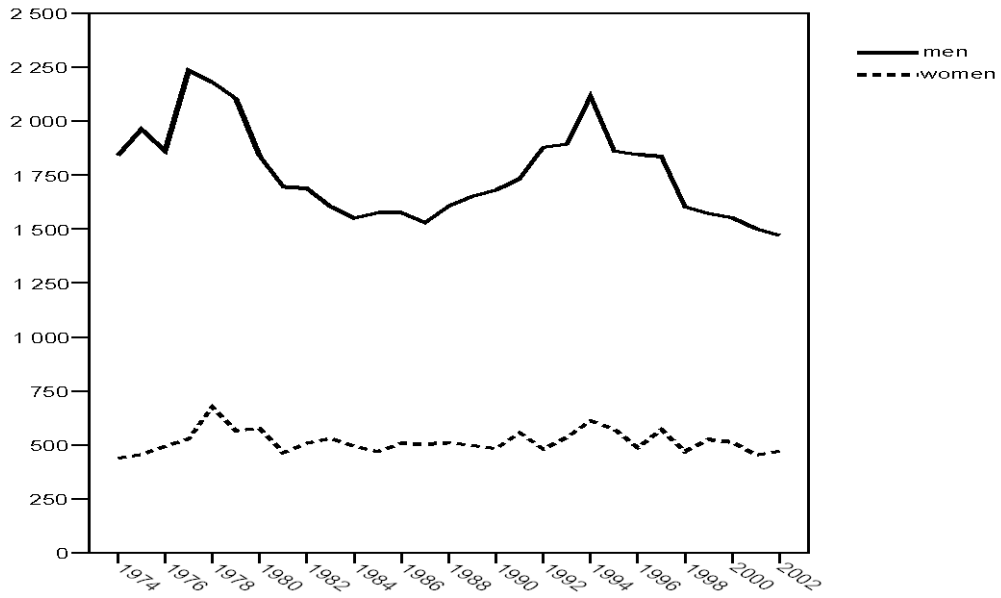

Figure 2. Number of hospital admissions resulting from violence, by sex, 1974-2002.

Age

The victims of violence resulting in hospitalisation are most commonly aged between sixteen and 34. As a result of their relative size, the groups included in this age range govern the main trend and the substantial increases/decreases in this trend. A particularly marked decrease in hospital admissions takes place within the age-group 25-34 during the final part of the study period (see Figure 3). No such marked decrease is visible among many of the other age-groups, and among the youngest and oldest victims in particular, the relatively high admission levels of the 1990s are preserved.

Age and sex

Thus it appears that the aggregate series of violent incidents resulting in hospitalisation includes subgroups presenting somewhat different trends. The trends characterising three

groups that may be said to be subject to different types of violence are studied in more detail below:

- Children of compulsory school age – most often subjected to "child abuse" by parents or "school violence" perpetrated by schoolmates.
- Young adults – a group comprised to a relatively large extent of single persons who actively participate in public entertainments and therefore run a greater risk of being exposed to street violence at the hands of persons not known to them. Among women in this age-group, "domestic violence" also constitutes an important category of incidents.
- Middle age – persons in this age-group are often exposed to "work-related violence".

The interesting question now is whether these groups present similar trends, in which case these trends might as easily be a result of reporting conditions as of trends in actual violence. Figures 3a and 3b show that five of the six age/sex groups present trends that differ from the aggregate pattern presented above. In addition, there are several examples of sex differences within the same age-group. Female victims among both compulsory school-age children and in middle-age present somewhat higher levels of victimisation from 1990 by comparison with their previous levels, including those of the latter part of the 1970s. The trend among women aged 25-34 differs dramatically, following a substantial and continuous decrease. The trend is also downward among male victims aged 25-34, although the decrease is not as continuous as that among women. Male victims of school-age present a relatively stable trend, particularly during the 1990s, and the only detectable change within this group takes the form of a slight decrease since the end of the 1970s. Finally, the trend among middle-aged men is more reminiscent of the aggregate pattern.

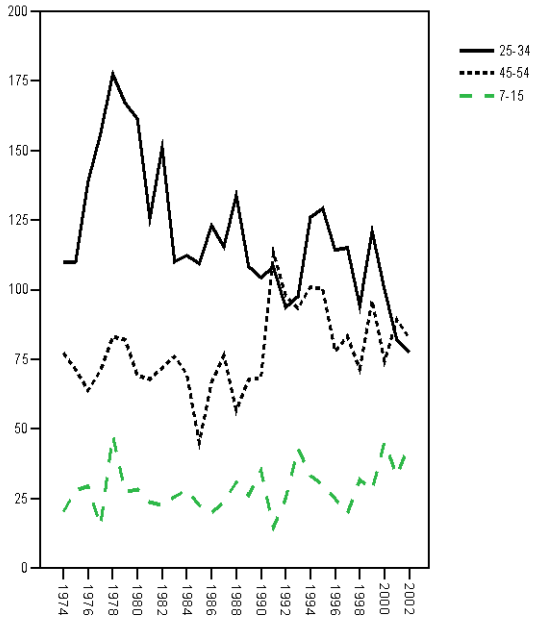

Figure 3a. Women, numbers of violent incidents in three age-groups.

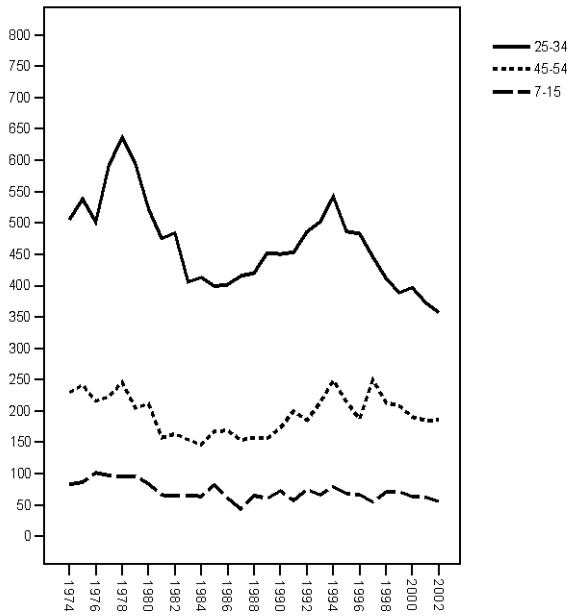

Figure 3b: Men, numbers of violent incidents in three age-groups.

The trend in different forms of injury

Figure 4 presents the trend in diagnoses relating to concussions, fractures and weapon-related injuries. We have already seen that gunshot wounds generally result in longer hospitalisation times, which may be interpreted as indicating that such incidents are highly likely to lead to an admission for in-patient treatment. The number of violent incidents involving gunshot wounds remains relatively stable throughout the period. The level of knife wounds remains stable between 1974 and 1996. In 1997 there is a sudden and dramatic shift, with the number of incidents classified as resulting from knife-related violence almost doubling (from 132 to 249). One possible explanation is that this is a result of the change in the classification system employed (from ICD-9 to 10) that took place in this particularly year. The fact that the trend remains stable (albeit at a higher level) following the change in classification system also suggests this interpretation.

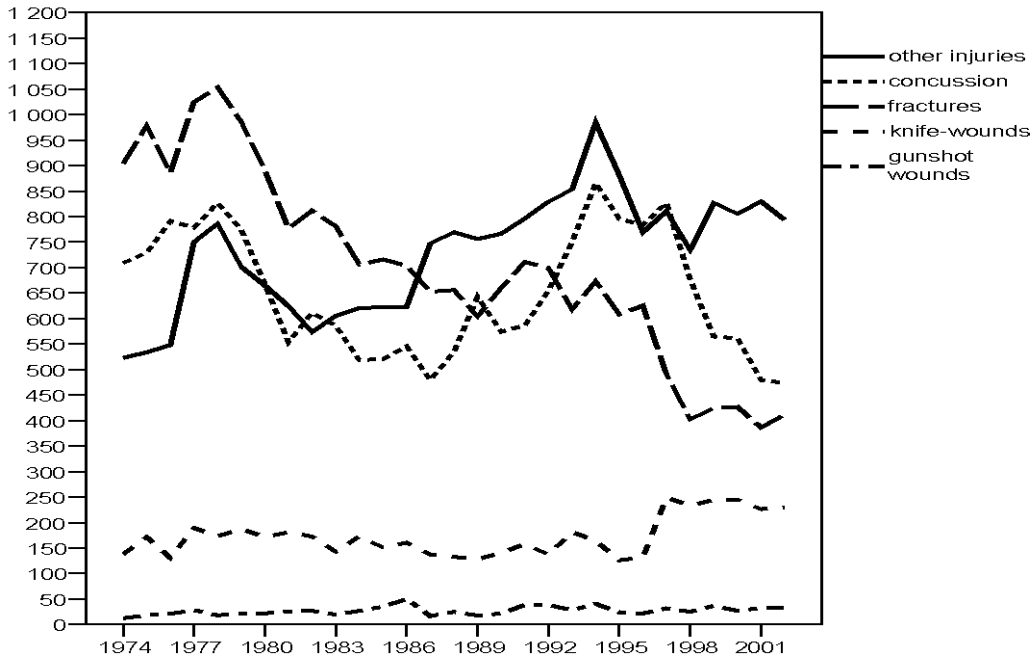

Figure 4. Number of violent incidents resulting in different types of injury. Fractures, concussions and other injuries, and number of incidents where the injury has been caused by a weapon. 1974-2002.

When one focuses on the trends in the other categories of injury, it is clear that the period has witnessed substantial changes. We know from the above presentation of hospitalisation times that periods of hospitalisation in connection with fractures are shorter than those relating to knife or gunshot wounds but significantly longer than those associated with concussions. Thus a fracture may be viewed as indicating a type of violent incident that is relatively likely to result in hospitalisation. It is therefore of some interest that the number of hospitalisations involving fractures has decreased substantially since the end of the 1970s. This decrease was continuous during the period 1980-1990, i.e. the same period during which the total number of hospital admissions noted in the HDR underwent an increase (see above). Thereafter, the number of fractures remains relatively stable for a long period up until 1997. This is followed by a shift that contrasts starkly with that noted in relation to knife-wounds; the number of fractures decreases sharply, and subsequently remains stable at the new, lower level.

Trends in hospitalisation times

Time spent in in-patient care in relation to violent injuries has undergone a substantial decrease (Figure 5). During the period 1974-1985, it was uncommon for a patient to be

admitted to hospital and discharged on the same day. Patients were instead most commonly kept in hospital for one to two days, and it was almost as common for periods of hospitalisation to continue for up to a week. As has already been shown, however, different types of injury are associated with substantial variations in hospitalisation times, with concussions in particular being characterised by relatively short periods of in-patient care. If these are excluded (they are not presented in Figure 5) it becomes even more clear that violent injuries at the beginning of the study period commonly resulted in a hospitalisation lasting several days. During the latter part of the 1980s, however, there is a marked change in hospitalisation times. At the same time as the number of hospitalisations resulting from violent injuries begins to increase again at this point, shorter hospitalisation times become more common. By the end of the study period, it is no longer uncommon for patients with violent injuries to be discharged from hospital on the day of admission. The primary explanation for the decrease in hospitalisation times however is a dramatic reduction in the number of incidents resulting in a longer period in hospital. This pattern is also found when the focus is directed at more serious injuries such as fractures and weapon-related injuries. Among the weapon-related injuries, for example, there is a substantial decrease among the longest hospitalisation times, and a simultaneous increase in the shortest periods of hospitalisation (primarily of one to two days).

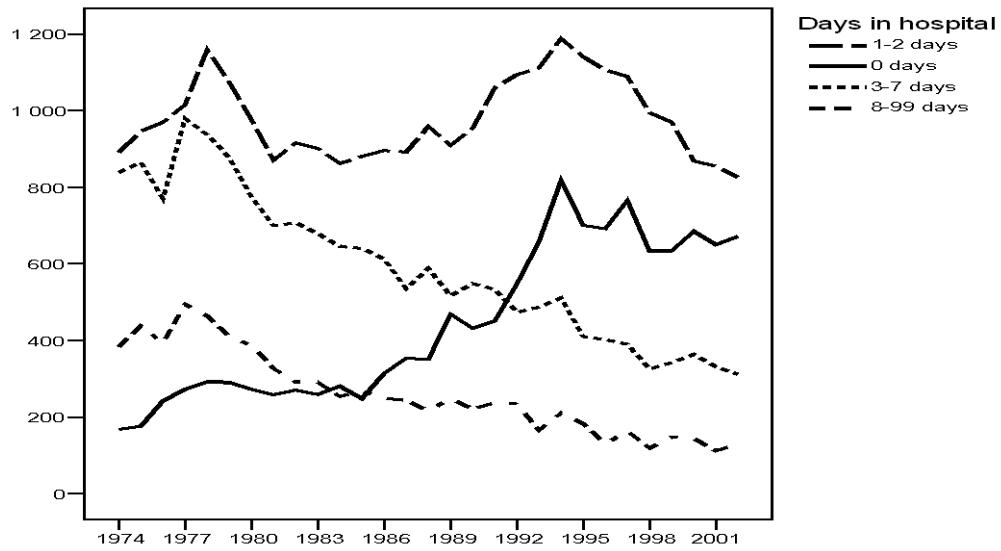

Figure 5. Number of days in hospital resulting from violent injury, 1974-2002.

Thus it seems likely that there have been changes in the way the health sector deals with violent injuries. Hospitalisation times have decreased primarily because fewer incidents result in long periods of in-patient care. To some extent this is linked to trends in the most serious types of violent incident. Thus the number of fractures that generally result in long periods of hospitalisation has decreased over time. At the same time, weapon-related injuries, the category requiring the longest stays in hospital, have not decreased but have rather remained stable. The decrease in hospitalisation times cannot therefore be explained by a reduction in the level of serious violence. What is instead more plausible is that on the one hand, the health sector's capacity to provide effective treatment quickly has improved, whilst on the other there have been increased demands for efficiency. Better treatment and greater demands for efficiency mean that patients may be discharged from hospital earlier, not uncommonly on the same day as the injury occurred. It nonetheless remains uncommon for particularly the more seriously injured victims (excluding those suffering from concussion) to be admitted and discharged on the same day. Between 1998 and 2002, 83 percent of incidents resulted in at least 24 hours in hospital (the mean for the whole period being 92 per cent). Thus the reduction in hospitalisation times cannot be seen as indicating that the victims of serious injuries are not being admitted for treatment. This is also underlined by the general trend presented above. The total number of hospitalisations has thus increased over a large part of the study period at the same time as hospitalisation times have decreased continuously.

Discussion

This article has analysed an underexploited indicator of trends in violence. As the Violence Research Group, University of Wales has pointed out trends in the number of violent injuries resulting in hospitalisation provide a means of complementing the indicators that have to date been employed by criminologists (Sivarajasingam et al. 2003). There are naturally a large number of problems and sources of error associated with this indicator, but this is also the case with other indicators such as victim surveys and crime statistics. The dark figure constitutes the most obvious of these problems. Violent injuries resulting in hospitalisation comprise only a small proportion of the violent incidents resulting in some form of treatment in Sweden. The majority of victims seeking treatment for violent injuries are dealt with as out-patients by hospitals, healthcare clinics, GP's surgeries, school nurses etc. There is at

present no way of determining the exact size of this dark figure. This constitutes an important question for future research.

The general picture that emerges from an examination of the almost 90,000 violent incidents recorded in the HDR between 1968 and 2002 largely confirms the broad demographic patterns identified using other sources of data on violence. Furthermore, it is difficult to view the trend in serious violence suggested by the hospital data as being the result of changes in health-sector priorities or other sources of error relating to the production of these statistics. It is difficult, for example, to see why women aged 25 to 34 should be given lower priority than men in either the same or other age-groups. Nor can such explanations account for the number of hospital admissions among female schoolchildren having increased somewhat since the 1970s by comparison with those among their male counterparts. What the HDR instead indicates is that trends in violence vary according to the type of violence involved and thereby also for different groups of victims. This pattern is also visible to some extent in the Scandinavian victim surveys. Exposure to violence at work has increased over recent decades, not least among middle-aged women (Balvig 2000; Heiskanen et al. 2004; Häll 2004:58ff). Exposure to threatening behaviour or violence in public places (street violence) has by contrast followed a decreasing trend since 1990 (Häll 2004:61; Heiskanen et al. 2004). Finally, Scandinavian self-report studies among youth (14-15 years) show that exposure to violence resulting in visits to a nurse, doctor or dentist has remained stable since these surveys began in 1995 (Kivivouri 2002; Ring 2003:34f).

By differentiating violent injuries resulting in different consequences and varying hospitalisation times, it has been possible to follow trends in incidents for which the probability of subsequent hospitalisation varies. Weapon-related injuries constitute perhaps the most interesting category in this regard. Injuries caused by both knife and gunshot wounds follow a stable trend. The exception to this rule is found in the clear level-shift in knife-wounds that occurred in connection with changes in the statistical routines in 1997. The stability of the level of weapon-related injuries thus corresponds more closely to the trend in lethal violence than it does to that found in statistics relating to reported attempted-homicides and assaults, which have increased substantially since the mid-1970s (cf. Harris et al. 2002 and O'Brien 2003).

One conclusion that may therefore be drawn on the basis of the data presented thus far is that despite the many potential sources of error, the number of violent injuries resulting in hospitalisation successfully reflects trends in serious violence in Sweden, at least in a broad sense. The plausibility of this conclusion will now be analysed in part by a calculation of the number of violent injuries which takes shortening hospitalisation times into consideration, and in part by means of a direct comparison with the indicator that lies closest to the contents of the HDR, namely the number of victim-survey respondents who report exposure to violence resulting in some form of healthcare contact.

An attempt at validating the trend in violence

When a new indicator is brought into use in connection with a phenomenon that is hard to measure, it is of course difficult to determine its validity. Throughout this article the results have therefore been compared with other relevant indicators of the distribution of and trends in serious violence. The considerable reduction in hospitalisation times provides a clear indication that changes have taken place in the way the healthcare sector deals with violent injuries. Irrespective of the type of injury, there has been a reduction in the number of long periods of hospitalisation and an increase in the number of short in-patient stays. From being very unusual, cases where the patient is admitted and discharged on the same day have become relatively common. This trend might be viewed as indicating that more is now required for hospitalisation, and thus that size of the dark figure has increased.

There are however factors that tell against the existence of such a direct link between reduced hospitalisation times and a drop in admission frequencies. The fact is that at least until the beginning of the 1990s, there is nothing to suggest an increase in the dark figure of violent injuries due to a drop in admissions to in-patient care; the reverse is rather the case. Between 1974 and 1994 there was a continuous increase in the *total* number of hospital admissions whilst at the same time the aggregate time spent in hospital has fallen continuously since at least 1987 (Estrada 2005).

Regardless of this objection, it may nonetheless be of interest to take the potential impact of reduced hospitalisation times on the trends noted earlier in the article into consideration. The possible fall in admissions among patients with violent injuries ought primarily to have affected violent incidents resulting in short periods of hospitalisation (i.e. 0-1 days of in-

patient treatment) since it is among these that there is a potential for treatment without hospitalisation. The reduction in hospitalisation times for injuries requiring relatively long periods of hospitalisation (two days or more) ought to constitute less of a problem in this context since these injuries are likely to have required hospitalisation – albeit possibly for a shorter period than previously. One thing we can be relatively certain of is that the most serious injuries, which usually require several days of in-patient care, are very likely to be included in the HDR. On the basis of these assumptions, it becomes possible to make an adjustment to compensate for a reduction over time in the number of injuries resulting in hospitalisation.

The method employed for this calculation is very simple. To begin with, all violent incidents resulting in a hospitalisation time of less than a full day between 1974 and 1989 have been excluded from the time series at the same time as all incidents from 1990 to 2002 have been included irrespective of the hospitalisation time involved.[4] What this calculation does is compensate for the possibility that events that had previously resulted in short hospitalisation times did not result in any kind of admission during the 1990s. The trend in this adjusted time series of violent incidents resulting in hospitalisation was then restricted to those aged between sixteen and 74, and was compared with the trend in the number of victim-survey respondents (aged sixteen to 74) reporting exposure to violence resulting in some form of medical care (Figure 6).

[4] Analyses based on alternative calculations have also been conducted, but these have no effect on the central trends in the time series. See Estrada 2005 for a more detailed presentation.

Figure 6. Proportion of 16-74 year-old victim-survey respondents reporting exposure during the previous year to violence requiring medical attention (variation between 0.5% and 1.3% for years 1977 to 2002) and adjusted number of violent incidents resulting in hospitalisation (of at least one day between 1974 and 1989, and irrespective of hospitalisation time between 1990 and 2002) among 16-74 year-olds (variation between 1,196 and 1,752 incidents). Y-axis values have intentionally been excluded from the presentation.

There is a considerable degree of correspondence between these two indicators of violence resulting in medical treatment. Both series indicate a high level of violent victimisation at the end of the 1970s, a lower level during the 1980s, an increase during the early 1990s culminating in levels similar to those of the 1970s and a clear peak around 1994-95, followed by a stabilisation in the trend over recent years. Thus neither of the series indicates that violence resulting in medical attention has increased continuously since the end of the 1970s, or that there has been an increase over the final few years of the period. This finding is of interest to discussions of the value that should be attributed to different indicators of trends in violence.

Conclusion

It was noted in the introduction that different data sources provide different pictures of trends in violence. The time series relating to those admitted to hospital as a result of violent injuries constitutes an additional source to be taken into consideration, which must of course be viewed as something positive. Given the relative stability of the level of violent injuries resulting in hospitalisation, the increase in *assaults reported to the police* remains the only clear indicator suggesting that violent crime is on the increase in Scandinavia. It is clear that health-care data join the group of indicators that provide no support for the contention that societal levels of violence have undergone a substantial increase over recent decades (see also Brink et al. 1997, and Wittebrood & Junger 2002, who describe corresponding tendencies in Denmark and Holland). This is important for the issue of where the most interesting issues for future research lie in relation to trends in violence in Scandinavia and other comparable countries:

- Despite the fact that the findings presented in this study run counter to the argument that the stability in levels of lethal violence is a result of hospitals being able to deal with larger numbers of more serious incidents (Harris et al. 2002) it would be of some value to study this hypothesis further. How common is it for the victims of lethal violence to have died before the health service has been afforded the opportunity to attempt to save their lives? How many such victims died previously subsequent to the arrival of an ambulance at the scene? Swedish figures for the short period 1987-94 indicates for example no increase in the survival rate (Boström et al. 1999, 2000; Wladis et al. 2000). An analysis of the substantial increase in the number of reported violent offences deemed to constitute attempted homicides would also be of value in this context.

- There should be a continuing detailed study of the link between trends in violence and other societal trends. Alcohol policy and alcohol consumption have undergone major changes in Scandinavia over recent decades (Room 2002). Social and economic developments over this same period have led to increased levels of inequality both in Scandinavia and other comparable western countries (Gottschalk & Smeeding 2000;

Palme et al. 2002). Since both alcohol consumption and inequality have shown themselves to be correlated with the extent of and trends in violence, there is good reason to expect these factors to have a visible impact on such trends (see e.g. Lenke 1990; Currie 1997). At the same time it is becoming increasingly clear that it is time to stop taking a general increase in levels of violence for granted. If the correct picture of trends in violence is characterised by stability over recent decades, then this raises a number of interesting theoretical questions. It is reasonable, for example, to ask to what extent alcohol consumption retains the same explanatory value that it has previously had in Scandinavia? Does the significance of increases in total levels of alcohol consumption vary depending on the nature of trends in consumption patterns, and if so how has the nature of this relationship changed? As regards the significance of inequality for trends in violence, there are research findings that suggest that apparently stable levels of victimisation may be hiding a polarisation in these levels across different social groups (Nilsson & Estrada 2003; Thacher 2004). A related issue that is well worth studying relates to the effects of increasing socioeconomic segregation at the level of the neighbourhood, where most of the work carried out to date has been based on American data (Sampson et al. 2002; cf. Trickett et al. 1995, however).

- There is clearly much to suggest that serious objections may be raised against the descriptions of levels of and trends in violence that have been disseminated by the media and in the public debate. The debate on violence as a social problem appears therefore at least in part to follow a dynamic that is not directly linked to the trends followed by the problem itself. A further, interesting research question is therefore that of attempting to understand both the mechanisms underlying this situation and its consequences for policy in general and for crime policy in particular. A good deal of interesting research has already been conducted in this area, pointing to the significance of the commercialisation of the media, political needs to find a focus for action following the loss of legitimacy associated with the questioning of welfare policy, the diminishing importance ascribed to expert knowledge within the crime policy debate and the entrance of the women's movement into the political arena with its focus on violence as a serious problem (Hall et al. 1978; Christie 1993; Beckett 1997; Åkerström 1998; von Hofer 2000; Garland 2001; Tham 2001; Andersson 2002; Estrada 2004; Balvig 2004). What needs to be investigated in more detail is in part

how these different factors interact, but perhaps more importantly the nature of the consequences produced by this description of reality.

References

ÅKERSTRÖM, M. (1998), "The Moral Crusade on Violence in Sweden - Moral Panic, or Material For Small-Talk Indignation", in V. Ruggerio, N. South, I. Taylor, eds., *European Criminology: a Handbook*, 323-338. London: Routledge.

ÅKERSTRÖM, M. (2002), "Slaps, Punches, Pinches—But not Violence: Boundary-Work in Nursing Homes for the Elderly", *Symbolic Interaction*, 25:515-536

ANDERSSON, R. (2002), *Kriminalpolitikens väsen*, (The Essence of Criminal Policy). Doctoral dissertation. Stockholm: Department of Criminology, Stockholm University.

BALVIG F. (2000), *Det Voldsomme Samfund. Om vold som problem og faengsel som lösning. vol. 1 & 2.* (The Violent Society. On violence as problem and prison as solution), Köpenhamn: Jurist- og Okonomforbundets Forlag.

BALVIG F. (2004), "When Law and Order returned to Denmark", *Journal of Scandinavian Studies in Criminology and Crime Prevention*, 5:167-87.

BECKETT, K. (1997), *Making Crime Pay. Law and Order in Contemporary American Politics*. Oxford: Oxford University press.

BOSTRÖM, L. & NILSSON, B. (1999), "A Review of Serious Injury and Death from Gunshot Wounds in Sweden: 1987 to 1994", *European Journal of Surgery*, 165: 930-936.

BOSTRÖM, L. HEINIUS, G. & NILSSON, B. (2000), "Trends in the Incidence and Severity of Stab Wounds in Sweden 1987-1994", *European Journal of Surgery*, 166:765-770.

BRINK, O., CHARLES, A.V., SABROE, S., JENSEN, J. AND SORENSEN, W. (1997), "Mindre Vold og Hyppigere Politianmeldelse", (Less Violence and More Reports to the Police), *Nordisk Tidsskrift for Kriminalvidenskab*, 84: 103-114.

CHRISTIE, N. (1993), *Crime Control as Industry. Towards GULAGS, Western Style*. London: Routledge.

COLEMAN, C. & MOYNIHAN, J. (1996), *Understanding Crime Data. Haunted by the dark figure*. Buckingham: Open University Press.

CURRIE, E. (1997), "Market, Crime and Community. Toward a mid-range theory of post-industrial violence", *Theoretical criminology*, 1:147-72.

DOERNER, W. (1988), "The Impact of Medical Resources upon Criminally Induced Lethality: A further examination", *Criminology*, 26:171-79.

DOOB, AN. & SPROTT, JB. (1998), "Is the "quality" of youth violence becoming more serious?" *Canadian Journal of Criminology*. 1998: 185-194.

ESTRADA, F. (2001), "Juvenile Violence as a Social Problem. Trends, media attention and societal response", *British Journal of Criminology*, 41, 639-55.

ESTRADA F. (2004), "The Transformation of the Politics of Crime in High Crime Societies" *European Journal of Criminology*, 1: 419-444.

ESTRADA, F. (2005), *Våldsutvecklingen i Sverige –en presentation och analys av sjukvårdsdata* (Trends in Violence according to Hospital Data). Working paper, Institute for Future Studies, Stockholm.

ESTRADA, F. & NILSSON, A. (2004), "Exposure to Threatening and Violent Behaviour among Single Mothers – the significance of Lifestyle, Neighbourhood and Welfare situation", *British Journal of Criminology*, 44:168-187.

GARLAND, D. (2001), *The Culture of Control. Crime and Social Order in Contemporary Society*, Oxford: Oxford University Press.

GOTTSCHALK, P. & SMEEDING, T.M. (2000), "Empirical Evidence on Income Inequality in Industrialized Countries" in A.B. Atkinson, & F. Bourguignon, eds, *Handbook of Income Distribution*. North Holland: Elsevier Science.

HALL, S., CRITCHER C., JEFFERSON T., CLARKE J. & ROBERTS B. (1978), *Policing the Crisis. Mugging, the State, and Law and Order.* London: MacMillan.

HARRIS, A., THOMAS, SH., FISHER, GA. & HIRSCH, DJ. (2002), "Murder & Medicine: The Lethality of Criminal Assault 1960 – 1999", *Homicide Studies* 6:128-166.

HEISKANEN, M., SIRÉN, R. & AROMAA, K. (2004), *Victimisation and Fear in Finland 2003*. Report 59. Helsinki: National Research Institute of Legal Policy,

VON HOFER, H. (2000), "Criminal Violence and Youth in Sweden: a Long-term Perspective." *Journal of Scandinavian Studies in Criminology and Crime Prevention*, 1:56-72.

VON HOFER, H. (2003), "Crime and Punishment in Sweden. Historical Criminal Justice Statistics 1750-2000", *Journal of Scandinavian Studies in Criminology and Crime Prevention*, 4:162-179.

VON HOFER, H. (2004), "Crime and Reactions to Crime in Scandinavia", *Journal of Scandinavian Studies in Criminology and Crime Prevention*, 5:148-66.

HÄLL, L. (2004), *Offer för vålds- och egendomsbrott 1978-2002*. (Victims of Violence and Property Crime), Report 104. Stockholm: Statistics Sweden.

KIVIVOURI, J. (2002), *Trends and Patterns of Self-reported Juvenile Delinquency in Finland*. Report 88. Helsinki: National Research Institute of Legal Policy.

LENKE, L. (1990), *Alcohol and Criminal Violence - Time series analyses in a comparative perspective*. Stockholm: Almqvist & Wiksell international.

NILSSON, A. & ESTRADA, F. (2003), "Victimisation, Inequality and Welfare during an Economic Recession. A Study of Self Reported Victimisation in Sweden 1988-1999", *British Journal of Criminology*. 43, 655-672.

O'BRIEN, R.M. (2003), "UCR Violent Crime Rates 1958-2000: recorded and offender-generated trends", *Social Science Research*, 32:499-518.

PALME, J., BERGMARK, Å., BÄCKMAN, O., ESTRADA, F., FRITZELL, J., LUNDBERG, O. & SZEBEHELY, M. (2002), "Welfare Trends in Sweden. Balancing the Books for the 1990s", *Journal of European Social Policy*, 12:329-346.

RING, J. (2003), *Stöld, Våld och Droger bland Ungdomar i Årskurs Nio*. (Theft, Drugs and Violence among Swedish Pupils), BRÅ-report 2003:5. Stockholm: Swedish National Council for Crime Prevention.

ROOM, R. (2002), *The effects of Nordic alcohol policies. What happens to drinking and harm when alcohol controls change?* NAD-report 42. Helsinki.

RYING, M. (2000), *Dödligt våld i Sverige 1990-1996.* (Lethal Violence in Sweden), Stockholm: Department of Criminology, Stockholm University.

SAMPSON, R.J., MORENOFF, J.D. & GANNON-ROWLEY, T. (2002), "Assessing 'Neighbourhood Effects': Social Processes and New Directions in Research", *Annual Review of Sociology*, 28:443-78.

SIVARAJASINGAM, V. & SHEPHERD, J. (2001), "Trends in Community Violence in England and Wales 1995-1998: an Accident and Emergency Department Perspective" *Emergency Medicine Journal*, 18: 105-109

SIVARAJASINGAM, V., SHEPHERD, J., MATTHEWS, K. & JONES S. (2003), "Violence-Related Injury Data in England and Wales – An Alternative Data Source on Violence", *British Journal of Criminology*, 43: 223-227.

STENE, R. (2003), "Levekårsundersökelsene 1983-2001: Vold og trusler i 20 år", (Studies of Living Conditions: Violence and Threats), *Samfunnsspeilet*, 2003/1, 2-7.
SUTHERLAND, I., SIVARAJASINGAM, V. & SHEPHERD, J. (2002), "Recording of Community Violence by Medical and Police Services", *Injury Prevention*, 8: 246-247.
THACHER, D. (2004), "The Rich get Richer and the Poor get Robbed: Inequality in US Criminal Victimisation 1974-2000", *Journal of Quantitative Criminology*, 20:89-116.
THAM, H. (2001), "Law and Order as a Leftist Project? The case of Sweden", *Punishment and Society*, 3, 409-426.
TRICKETT, A., ELLINGWORTH, D., HOPE, T. & PEASE, K. (1995), "Crime Victimisation in the Eighties", *British Journal of Criminology*, 35, 343-59.
WESTFELT, L. (2001), *Brott och straff i Sverige och Europa.* (Crime and Punishment in Sweden and Europe - a Study in Comparative Criminology), Doctoral dissertation, Stockholm: Department of Criminology, Stockholm University.
WESTFELT, L. & ESTRADA, F. (2005), "International Crime Trends: Sources of Comparative Crime Data and Post-war Trends in Western Europe", in J. Sheptycki & A. Wardak eds., *Transnational and Comparative Criminology*, London: Glasshouse press.
WITTEBROOD, K. & JUNGER, M. (2002), "Trends in Violent Crime: A Comparison between Police Statistics and Victimization Surveys" *Social Indicators Research*, 59:153-173.
WLADIS, A., BOSTRÖM, L. & NILSSON, B. (1999), "Unarmed Violence-Related Injuries requiring Hospitalization in Sweden from 1987 to 1994" *The Journal of Trauma, injury, infection and critical care*, 47: 733-737.