Peer reviewed article

Are times getting tougher? A six-year survey of urban violence-related injuries in a Swiss university hospital

Aristomenis K. Exadaktylos, Stephanie Häuselmann, Heinz Zimmermann

Department of Emergency Medicine, Inselspital, University Hospital of Bern, Switzerland

Summary

Questions under study: Injuries due to interpersonal violence are a worldwide public health problem. In Switzerland, interpersonal violence seems to be an increasing problem in emergency departments (EDs) and is a topic of keen public debate. The primary objective of the current study is to describe our experience of interpersonal violence-related ED visits over a six-year period.

Methods: Retrospective analysis of medical records using the ED electronic patient database (Qualicare, Qualidoc Bern). Demographics, diagnosis, length of stay, ED and hospital charges were compared for each year.

Results: From 1.1.2001 to 31.12.2006 we treated a total of 1190 patients injured in interpersonal violence. 1064 (89%) were males and 126 (11%) females. The mean age was 27 years (SD 10). 752 patients (63%) were Swiss citizens and 438 (37%) non-Swiss. 853 patients (71%) were employed and only 73 (6%) were unemployed in 2006. There was an increase from 155 patients in 2001 to 275 in 2006. Compared to 2001 there was an increase in cases over weekends. 796 patients (78%) were discharged within 24 hours of injury and 110 (12%) were kept for more than 24 hours. Injuries to the head and extremities were the most frequent. The leading cause of injury was blunt instruments (96%). The median cost of initial treatment per patient admitted increased from CHF 1100 (IQR 5, 4900) in 2002 to CHF 5000 (IQR 3100, 7300) in 2006.

Discussion: There has been no significant change in patients' age nor a shift in the nationality of patients over the past 6 years There has been a notable increase in patients needing hospitalisation, principally due to a rise in serious head injuries, a factor contributing to a impressive increase in costs per patient. The data presented here are intended as a basis for further research in the field of violence and prevention throughout Switzerland.

Key words: violence; urban; injuries; Switzerland; prevention

Introduction

Urban violence (UV) is a worldwide problem which brings a large number of patients to emergency departments around the world and also in Swiss hospitals [1]. Although in Switzerland nearly every health care provider in an acute care setting treats victims of UV on a regular basis, and although this phenomenon recently aroused mainstream interest in the Swiss tabloid press, medical and sociomedical studies for Switzerland are still few and far between [1].

UV can be defined as a conscious physical act aimed at causing injury to others, including bodily and psychological trauma. The majority of studies support social and psychological factors as the driving force of UV. UV has generally been regarded as an aspect of human aggression [2]. Others have seen it as the expression of masculine behaviour in working-class culture [3]. In agreement with anthropological evidence, most authors agree that males are more physically aggressive than females [4]. Explanations of UV fit it into one of two frameworks: a subculture of violence (gang-related violence) and spontaneous violent eruptions with a "wrong time wrong place" pattern [5]. The latter may be the current problem in Switzerland. The aim of this study was to investigate the development of this phenomenon and the rates and types of injury due to violent behaviour (excluding domestic violence) among patients presenting to an urban emergency department over a six-year period.

No conflicts of interest for any author and no outside funding for the study.

Material and methods

The study was conducted in an inner-city trauma and emergency unit with approximately 29,000 annual emergency department visits from January 1, 2001 to December 31, 2006. The emergency unit at the Inselspital, University Hospital of Berne is the only Level 1 accident and emergency unit in this area providing service for all social classes and insurance groups.

Collecting data

The data were collected retrospectively using our emergency room software Qualicare™ (Qualidoc, Trimbach-Switzerland). The software is able to connect clinical data with classified key words, thus making it possible to search immediately for e.g. patient groups with a particular diagnosis.

All patients in the above-mentioned period were automatically scanned for the standardised key words: "Schlägerei" (Engl. brawl), "Schlag" (Engl. hit), "Tritt" (Engl. kick), "Gewalt" (Engl. violence), Stich (Engl. stab), Schuss (Engl. shot), which are used routinely by our triage for reported cases of violence-related injury. Sex, age, nationality, location and cause of violence, injury pattern, time, day and time of injury, hospitalisation rate and costs were noted. The results rely on information generally recorded for every ER patient and on patient, paramedic or police testimony (if patients are escorted to the ER).

Results

Between 1.1.2001 and 31.12.2006 we treated a total of 1190 patients injured in interpersonal urban violence. This is less than 1% of all the patients treated in the 6-year period. The number of injured patients increased from 155 in 2001 to 275 in 2006 (Fig. 1). 1064 patients (89%) were males and 126 (11%) females. The mean age was 27 years (SD 10).

Nationality and ED visits: The nationality of a patient was recorded on the basis of passport or identity card. 752 patients (63%) were Swiss and 438 (37%) non-Swiss citizens. There was a

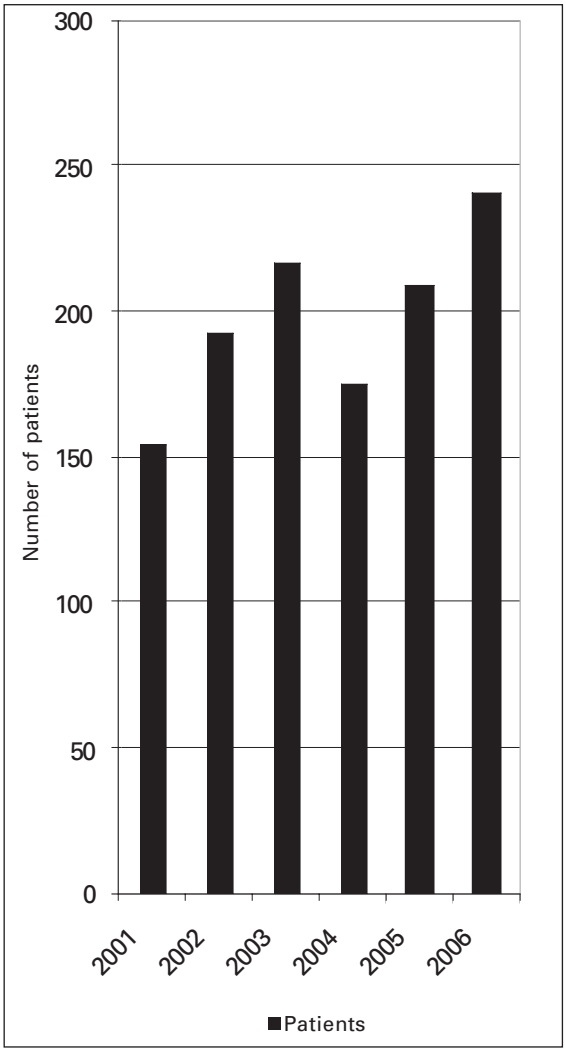

Figure 1
Number of patients seen per year.

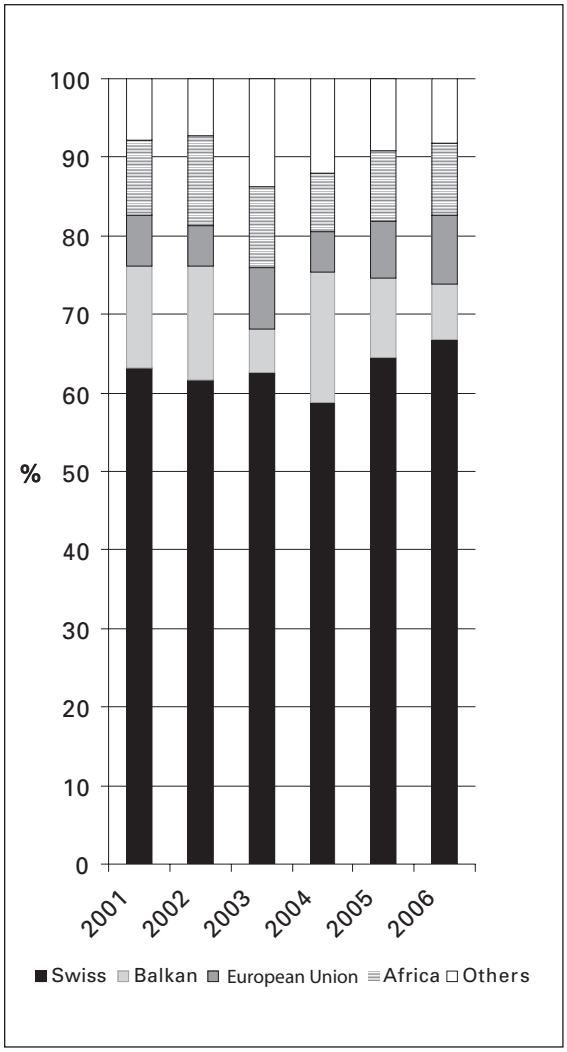

Figure 2
Nationality of patients [%] seen per year.

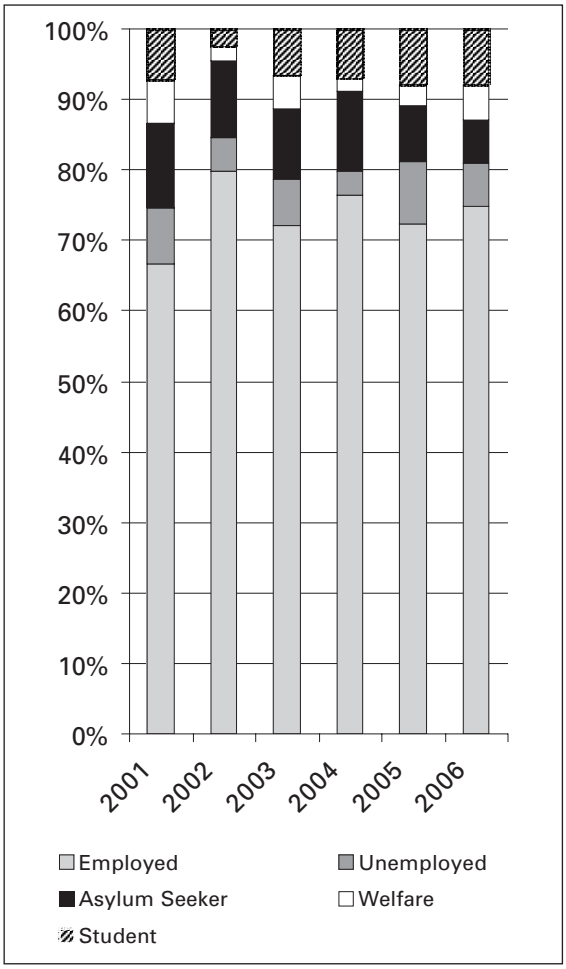

Figure 3

Social status of patients [%] seen per year.

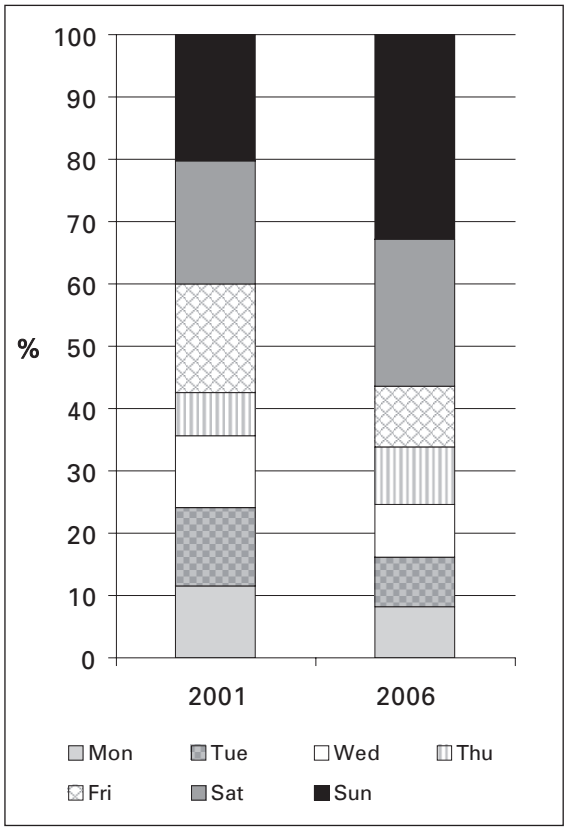

Figure 4

ED visits [%] between Mondays and Sundays in 2001 and 2006.

slight increase in the percentage of Swiss patients visiting the ED, from 63% in 2001 to 67% in 2006. The percentage of non-Swiss patients decreased in the same period from 37% to 33%. A decrease in the percentage of visits was noted for the group of citizens from the Balkans (excluding current member states of the European Union) (13% in 2001 vs. 7% in 2006). A slight increase was noted in the percentage of EU citizens (6% in 2001 vs. 9% in 2006). The percentage of African patients in the ED did not change (9% from 2001 to 2006) (Fig. 2).

Age and ED visits: Over the last six years the mean age of the patients has not changed: 27 years (SD 10) in 2001 and 26 (SD 10) in 2006. Among Swiss citizens the mean age decreased slightly from 27 years (SD 10) in 2001 to 26 (SD 10) in 2006. Among non-Swiss there has been an increase in age from 27 years (SD 9) in 2001 to 29 years (SD 10) in 2006.

Social status and ED visits: All patients were assigned to a social status according to the hospital nomenclature. 853 patients (71%) were employed and only 73 (6%) were unemployed. No change was noted over the six years. 109 patients (9%) were asylum seekers. The percentage of asylum seeking emergency room attendees dropped by nearly 40% to a low of 6% in 2006 compared to 11% in 2001 (Fig. 3).

Weekly distribution and ED visits: Compared to 2001 there was an impressive increase in interpersonal violence at the ED during weekends (Fridays 22:00 to Sundays 6:00) and early morning hours (0:00–4:00) (Fig. 4).

Hospitalisation after ED visit: The type of hospitalisation was recorded on the basis of hospital nomenclature: 1) immediate discharge, 2) hospitalisation for up to 24 hours, 3) >24 hours in hospital. Over the six-year period 796 patients (78%) were discharged within the first 24 hours after injury. 110 (12%) were kept for more than 24 hours. In 2001 only 5% of all patients injured in interpersonal violence were admitted to hospital for >24 hours compared to 14% in 2006. Accordingly, the number of patients staying for less than 24 hours (outpatients) decreased from 94% in 2001 to 76% in 2006 (Fig. 5).

Location of injuries: Head and face were injured in 61% of all cases. In 2001 only 11% of the injuries were cranio-facial fractures, compared to 17% in 2006. An in-depth analysis of the injuries revealed an increase in major and complex craniofacial trauma. Cerebral concussion injuries increased from 8% in 2001 to 13% in 2006 (Fig. 6). Cerebral haemorrhage, on the other hand, remained stable at 1% of all cases in 2001 and 1% in 2006 respectively. Injuries to the extremities increased from 24% in 2001 to 28% in 2006. The abdomen was injured in 3% of patients and the chest in 8%, with no relevant change over the 6-year period. The remaining patients sustained soft tissue injuries (bruises) and superficial lacerations.

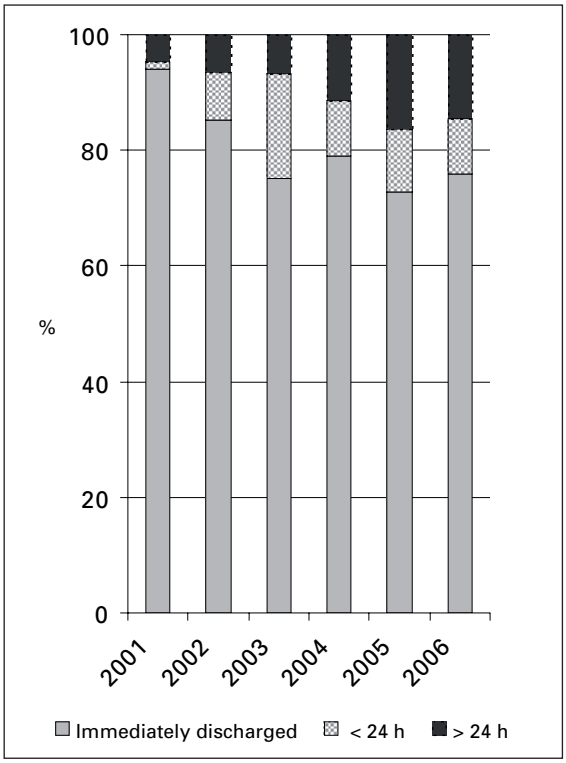

Figure 5

Treated patients [%] according to duration of hospitalisation.

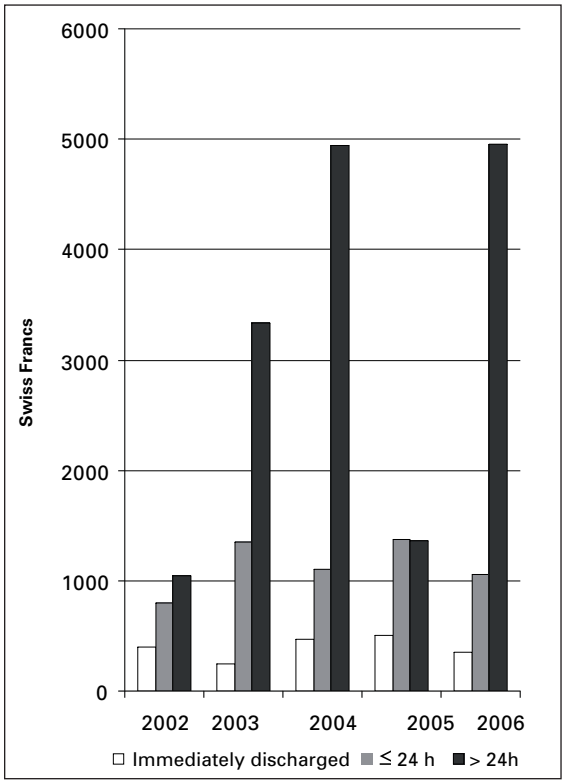

Figure 7

Median costs per patient between 2002 and 2006.

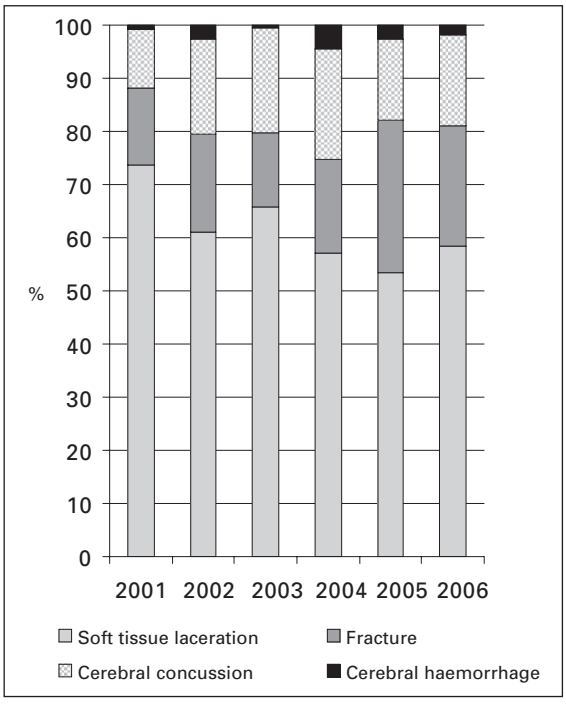

Figure 6

Type of head injury [%].

Cause of injuries: The leading cause of injury was blunt instruments (96%). We noticed an increase in sharp instruments as weapons from 4% in 2001 to 7% in 2006.

Costs and ED visits: The median charge per patient discharged on an outpatient basis was CHF 400 compared to CHF 1100 for a stay of up to 24 hours and CHF 3700 for patients admitted to hospital. The median costs for an admitted patient more than doubled from a median of CHF 1100 per patient in 2002 to a median of CHF 5000 per patient for initial treatment (Fig. 7).

Follow-up costs for secondary hospitalisations, rehabilitation etc. were not included.

Discussion

Our data are the first to document the evolution of violence-related injuries in an urban emergency department in Switzerland over a six-year period. A weakness of our study is that we were obliged to rely heavily on the testimony of the patients themselves, the paramedics or the police, which in some cases makes it difficult to distinguish between victims and attackers. Hence no such classification has been used.

Our data do however show that patient numbers associated with violence have increased by nearly 60% over the six years covered, although

the number of patients visiting our ED for causes unrelated to urban violence remained unchanged and that men are predominantly involved. In contrast to our expectation that patients involved in violence are teenagers without a solid social background, we noted that the majority had a profession, an income and were in their mid-twenties. The rise in costs since 2002 may not be due to the growing number of craniofacial traumas alone but to the introduction of more expensive diagnostic tests over the years (CT, MRI, etc.). A future study will provide an in-depth analysis of long-term costs to society.

Concerning the discussion surrounding patients' nationality, our data show that Swiss citizens represent more than half of all patients seen. The appreciable decrease in the percentage of asylum seekers among our patients could be explained by the decline of refugee numbers in Switzerland from 92,540 in 2001 to 68,131in 2006.

But if we compare the population of the City of Bern with the average patient population visiting our ED we notice that non-Swiss are overrepresented among the patients visiting the ED, at 37% of patients compared with 21% non-Swiss resident in the city of Bern. This could be due to the special function of a non-private inner city emergency department open to all social classes and migrant groups.

We would anticipate that non-Swiss are on average younger than Swiss, and thus if those visiting the ED are younger it is to be expected that a greater percentage of non-Swiss will be seen in the ED than in the wider population.

A major concern is the shift in violent behaviour towards weekends, possibly explicable by increased alcohol consumption.

The role of alcohol and drugs in violent behaviour should be investigated in a future study, because for legal reasons routine blood or breath testing for alcohol and drugs is not part of our standard hospital protocols. Another concern is the increasing severity of injuries, due to more brutal attacks to the head, a factor which contributes to longer hospitalisations and increased costs per patient. Fortunately all injured patients presenting to our ED survived, whereas other hospitals in Switzerland have recently reported fatal outcomes for assaults and similar experiences. From the viewpoint of emergency healthcare providers a goal should be anticipation and prevention of increased urban violence. A survey during a weekend night shift in our ED showed that the entire staff felt ill-educated with respect to the identification, assessment, and referral resources available for early intervention and prevention. Hence increased efforts to provide basic knowledge, money and skills are needed [7–10]. Such efforts should move beyond responding to acute cases of violence only and consider the hospital emergency department as an active player in a communitywide effort to end violence. It would do this through universal screening, assessment, treatment and other interventions, documentation, and patient and professional education. The emergency department is a common site for the care of these victims, and because victims often become assailants, the emergency care provider needs to know the epidemiology, treatment, and methods for prevention of youth violence, in order to curtail the cycle. Screening and treatment programmes are validated, numerous, flexible, adaptable and available through psychologists and social workers [11]. Results from outside Switzerland are encouraging and show good results if methods are selected properly and adapted to local needs [12, 13]. Increasing violence in society is a "cancer like" disorder and effects not only the patients directly involved but society as a whole. Violence may lead to polarisation and often disintegration, thus worsening the situation. We think our results (1% of our ED population is affected by violence) represent only the "tip of the iceberg", but we are convinced that investing in violence prevention programmes is an investment in the future of our country. We agree that more research is needed to bring out the full picture.

In conclusion, at our institution there was an increase in UV between 2001 and 2006. Education of the public and early prevention of violence is important. Increased and skilled communication between the diverse elements of society in the elimination of barriers of social status, race, religion and ethnic background is needed, and probably holds out the greatest promise of breaking the cycle of violence. Although UV appears to be less rife in the region of Bern than in other cities around the world, and although our study population was limited, we believe our data can be viewed as an early warning sign. We would like to encourage other departments and hospitals in Switzerland to document their experience in this field, with the object of establishing a nationwide violence trauma data bank.

We would like to thank Kathrin Aeschlimann and Stephan Fuhrimann for their assistance in collecting data from hospital records.

Correspondence:
Dr. med. A. K. Exadaktylos
Oberarzt Notfallmedizin
Universitätsspital Bern
Notfallzentrum
CH-3010 Bern
Switzerland
E-Mail: aristomenis@exadaktylos.ch

References

1 Exadaktylos AK. Violence in Bern. Swiss Med Wkly. 2001; 131(35-36):527.
2 Tonry M, Moore MH. Predictors, causes, and correlates of male youth violence. Youth Violence. pp. 421–76 Chicago: Univ. Chicago Press
3 Farrington DP. 1996. The explanation and prevention of youthful offending. In Delinquency and Crime: Current Theories, ed. JD Hawkins, pp. 113–31. Cambridge, UK: Cambridge Univ. Press
4 Messerschmidt J. 1995. From patriarchy to gender: feminist theory, criminology, and the challenge of diversity. In International Feminist Perspective in Criminology: Engendering a Discipline, pp. 167–88. Philadelphia: Open Univ. Press.
5 Spergel IA, Curry GD. 1998. The national youth gang survey: a research and development process. See Miller et al. 2001; pp. 254–65.
6 Anderson E. 1997. Violence and the inner-city street code. In Violence and Childhood in the Inner City, ed. J McCord, pp. 1–30. Cambridge, UK: Cambridge Univ. Press.
7 Vigil J. Urban violence and street gangs. Annu. Rev. Anthropol. 2003;32:225–42.
8 Boergerhoff LA, Gerberich SG, Anderson A. Out-of-hospital violence injury surveillance: quality of data collection. Ann Emerg Med. 1999;6:745–50.
9 Steen K, Hunskaar S. Violence in an urban community from the perspective of an accident and emergency department: a two-year prospective study. Med Sci Monit. 2004;10(2):-CR75–9.
10 Stone DH, Doraiswamy NV. The Canadian Hospitals Injury Reporting and Prevention Program (CHIRPP) in the UK: a pilot study., Inj Prev 1996;1:47–51.
11 Denninghoff KR, Knox L, Cunningham R, Partain S. Emergency medicine: competencies for youth violence prevention and control. Acad Emerg Med. 2002;9(9):947–56.
12 Zun LS, Downey L, Rosen J. The effectiveness of an ED-based violence prevention program. Am J Emerg Med. 2006;24(1): 8–13.
13 Limbos MA, Chan LS, Warf C, Schneir A, Iverson E, Shekelle P, et al. Effectiveness of interventions to prevent youth violence: a systematic review. Am J Prev Med. 2007;33(1):65–74.

Addendum

The first six months of 2007 show not an increase in cases but an increase in severity of craniofacial injuries, and alcohol seems to be an issue!

Because of the strong interest in data concerning youth violence, we feel that the following data from the first six months of 2007 will contribute to the discussion.

We compare these findings with our previous data.

1. General demographics

Between 1.1.2007 and 22.7.2007, we identified the files of 122 patients (116 male, 95%, 6 female) with the emergency unit software Qualicare™.

The average age of the study population (n = 122) was 28 years (range 16–61). 59% of the patients were Swiss and 41% other nationalities. Compared to the six-year period, the contribution of male participants rose slightly (89% 2001–06, 95% 2007); other demographic data such as average age or nationality remained unchanged.

2. Head injuries

According to the mass media, times are getting tougher year by year. Unfortunately this appears to be true: compared to 2006, there has been an increase from 61% to 81% (n = 99) in head and facial injuries in the first six months of 2007. Violence is growing in intensity, 22% (n = 27) of all injuries being craniofacial fractures compared to 11% in the previous years.

3. Alcohol

Alcohol appears to be a strong component in interpersonal violence and a topic of debate in Switzerland [1]. Due to legal restrictions, we had no access to objective assessment of blood-alcohol concentration in the study population. Hence our observations are based on the case history and the subjective impression of the physician, which was noted in the patients' files (e.g. "Seems intoxicated with alcohol," "strong alcohol odour" "admits having consumed 10 glasses of beer", etc.) We assume that alcohol levels may be very high if they are to be noteworthy for the physician.

We identified 44 alcoholised patients (36%). Alcohol was mentioned in 40% (n = 29) of case histories of Swiss and in 30% (n = 15) of non-Swiss.

We suspect that the real influence of alcohol and illicit drugs may be even higher. In that context, more accurate data on the impact of alcohol and drugs on interpersonal violence is needed, not only to improve treatment but also to improve prevention.

Victor Jeger, Aristomenis Exadaktylos

1 Zufferey A, Michaud PA, Jeannin A, Berchtold A, Chossis I, van Melle G, Carles Suris J. Cumulative risk factors for adolescent alcohol misuse and its perceived consequences among 16 to 20 year old adolescents in Switzerland. Prev Med. 2007 May 13.