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Child Abuse and the External Cause of Death in Estonia

Marika Väli[1,2], Jana Tuusov[2], Katrin Lang[3] and Kersti Pärna[3]
[1]*Institute of Pathological Anatomy and Forensic Medicine, University of Tartu*
[2]*Estonian Forensic Science Institute*
[3]*Department of Public Health, University of Tartu*
Estonia

1. Introduction

Violence against children cuts across boundaries of geography, race, class, religion and culture. Injury and violence are serious threats to the health and well-being of children worldwide. Children are at high risk from injuries that can lead to death or disability.

A small proportion of violence against children leads to death, but most often the violence does not even leave visible marks. Violence can have severe implications for children's development and in the most severe cases, it can lead to death or injury. However, it can also affect children's health, their ability to learn or even their willingness to go to school at all.

The World Health Organization (WHO) estimates that 40 million children below the age of 15 suffer from abuse and neglect, and require health and social care. In 1998, a UNICEF report quantified the large East-West gap in European child mortality from external causes (injuries and violence). In the past decade, much has changed in central and Eastern Europe, economically, politically and socially. Some positive changes are seen in child injury rates in this region, and hopefully the East-West gap in European child mortality will diminish.

Violence against children is defined as any form of violence, whether physical, mental and sexual, abandonment or negligence, ill-treatment or exploitation that puts their lives in danger or negatively impacts their lives, physical or psychological health dignity, or development.

In this chapter we present recent trends and current situation of child injury mortality in Estonia. We also describe the forensic medical system, examination of the child and the expert report, and give an overview of cases physical and sexual child abuse in Estonia.

In Estonia forensic medical doctors are a medical experts in physical and sexual abuse assisting Law Enforcement, but they are also involved in investigating all child deaths due to external factors.

In all cases including child abuse, an examination by a forensic medical doctor is done only when requested by a police officer, prosecutor or court. In cases where the child is less than 16 years of age, a parent, police officer, teacher, social worker or careworker must be present during the examination. The examination of a child is carried out at the forensic department or at the hospital if the child is admitted for inpatient treatment.

2. The examination of the child and the expert report

In suspected child abuse cases an examination is performed. The aim of the examination is to find out the primary injury, but also to carry out physical examination of the child and record.

During the examination the forensic medical doctor describes the signs and symptoms that could point primarily to the presence of injuries or the complication of injuries. Often the expertise is not timely as the child requires medical attention. In these cases the doctors must document and describe the injuries and sometimes the full examination is performed at the hospital.

As in other countries, the medical doctor may lack knowledge to detect and record injuries, so the forensic examination is needed. From incorrectly completed medical documents the forensic doctor can not decide what kind of injuries the victim has, nor the timeline or the cause of injuries.

The task of the forensic medical doctor is to find the injuries, timing and causes of injuries and answer all questions that may rise during the proceedings. In all cases involving child abuse, an examination by a forensic medical doctor is done only when requested by a police officer, prosecutor or court. In case the child is less than 16 years of age, a parent, police officer, teacher, social worker or careworker must be present during the examination. The examination of a child is carried out at the forensic department or at a hospital if the child is there.

The forensic medical experts report details the existence or the absence of injury to health; the nature of the injury (diagnosis); the way the injury was incurred; assessment to the link between the person's previous state of health and injury to health (if applicable); the injury's threat to life; the duration of the injury; other conclusions related to the assignment. A forensic doctor can use also the opinion of other medical specialists and this will be also mentioned in the examination. In physical abuse cases involving children often a paediatrician is involved in the examination.

In recent years, special rooms have been created for questioning and examining children at the police stations throughout Estonia. Police officers with special training, prosecutors and other specialists use these rooms when dealing with children.

3. Child abuse

Child abuse is a worldwide problem affecting children from birth to 18 years of age. Each year, hundreds of thousands of children suffer abuse or neglect. Many studies have shown a consistent pattern regarding the abuse and neglect inflicted on children of both genders. Approximately 75% of sexual abuse is inflicted upon girls. Girls also are more likely to suffer from emotional abuse and neglect. Boys, on the other hand, are more likely to experience physical trauma (other than sexual abuse). When focusing solely on cause of death, studies indicate fathers are more likely to kill their child via physical abuse, while mothers kill by neglect (for example, starvation).

In most cases, the abuser is someone known to the child – a parent, family member, teacher, or regular careworker. The issue of abused children is an important public health problem since intra-family violence, including child abuse, is a so-called inside-family problem that is usually not discussed in public. The risk of child abuse is higher in families where there are often conflicts between family members, low parental involvement in the family and cold or hostile relationships between children and their parents. Those parents who had been

abused during their own childhood were more likely than others to abuse their own children. We found that family sociopathy (alcohol problems) and some family members disability or handicap problems might predict child maltreatment; low family income and poor parental warmth are associated with risk for child neglect. Therefore the number of cases concerning child abuse is relatively low in comparison with other countries.

In Estonia the issue of abused children has been under discussion since 1990. Child abuse in Estonia is probably far more prevalent than generally thought. As elsewhere, national statistics are not available, as the nature of the problem makes it hidden in the society and difficult to detect and record. The pupils from different types of schools who have participated in such studies confess that they have encountered emotional, physical, and sexual abuse as well as negligence. The most common types of abuse according to these inquiries were verbal sexual abuse, negligence of education, emotional abuse, mental sexual abuse, and negligence of health. Physical abuse, physical sexual abuse and physical negligence were less common. Most abused children suffer greater emotional than physical damage. An abused child may become depressed. He or she may withdraw, think of suicide or become violent. An older child may use drugs or alcohol, try to run away or abuse others. However, when comparing the findings of studies performed in pupils from ordinary Estonian schools with those for children with special needs, the incidence of negligence and sexual abuse are far more common in the latter ones. It can be also said that the problem of abused children has gained more attention in the recent years. For example, this is reflected in the discussions about whether to hit children is acceptable or not. The attitude towards hitting a child has changed in recent years. Still, these discussions have not reached the point as to where to draw the line between an accident and child abuse. This to a large extent is a matter of definition. When a two-year-old child drowns in the pond – is it an accident or negligence? In Estonia such cases are usually considered accidents.

3.1 Physical abuse

Physical abuse is physical aggression directed at a child by an adult, but this is very often neglected and without adequate attention. The reason for this is that the specialists of different fields do not cooperate. It is of paramount importance that the specialists of different fields think in the same way in the event of child abuse, and also understand the ways of acquiring injuries in the same way.

The physical signs of child abuse is sometimes called battered child syndrome. Physical abuse tends to occur at moments of great stress. Physical child abuse or non-accidental child trauma refers to fractures and other signs of injury that occur when a child is hit in anger.

According to the data by the Estonian Forensic Institute about 50 children less than 14 years of age annually need physical examination. Most of the cases are related to violence at school or at home, but children are also injured in traffic accidents. During recent years the number of detailed examinations of physically abused children has decreased by 50%. The number of children injured in traffic accidents has also decreased (with only a handful of cases each year). From 2001 to 2009 most of the children examined were between 7 and 14 years old, boys incurred injuries three times more often than girls, and only 10 children under one year old did so.

According to the literature data, the injuries acquired in association with child abuse comprise 7–27% of the total number of injuries to children (Overpeck et al., 1999), and children are most frequently assaulted at the age of less than five years (Laursen & Nielsen,

2008). Among the prevailing injuries are bruises, abrasions and other mild injuries; head, face and extremities are the most frequently affected regions.

Who causes the injuries? Fathers, mothers, adoptive parents, other members of the family.

Why are children abused? Often the reason is discord in the family, single mothers, underaged pregnancies, low educational level of the parents and poor living conditions (Lang et al., 2010). Many people who commit physical abuse were abused themselves as children. As a result, they often do not realize that abuse is not appropriate discipline. Often people who commit physical abuse also have poor impulse control. This prevents them from thinking about what happens as a result of their actions.

The causes of hospitalisation have been studied in the case of traumas to children in Estonia, and it appears that the main cause of hospitalisation for children of this age are contusions, bone fractures and wounds associated with a fall. Apart from the falls the others cases of suspected abuse include burns, the occurrence of different objects in throat, and unclear cases.

According to the questionnaire study carried out in Estonian schools during 2001–2009, 45% of children suffer from school violence but most of them do not inform their parents or the police about it. One fifth (20%) of children get hurt at school, one fourth (25%) of children are injured by their schoolmates and 1/10 (10%) of children suffer from domestic violence. One of the causes of physical abuse in small children is definitely the shaking of babies, i.e. Shaken Baby Syndrome (SBS). In Estonia Shaken Baby Syndrome was first diagnosed in 1999.

Shaken Baby Syndrome is most common in children below one year of age, and it is known to occur as a result of child abuse - it is caused by vigorous shaking and/or swinging of the infant. In most cases, an angry parent or caregiver shakes the baby to punish or quiet the child. Such shaking usually takes place when the infant is crying inconsolably and the frustrated caregiver loses control. Many times the caregiver did not intend to harm the baby. When an infant or toddler is shaken, the brain bounces back and forth against the skull. This can cause bruising of the brain (cerebral contusion), swelling, pressure, and bleeding in the brain. The large veins along the outside of the brain may tear, leading to further bleeding, swelling, and increased pressure. This can easily cause permanent brain damage or death.

Excessive shaking causes the rupture of cortical and bridging veins in the brain, possibly resulting in subdural haematoma, or less frequently subarachnoid haematoma and brain oedema. Subdural haematoma is the most common intracranial pathology observed in cases of SBS, and it is seen in approximately 80% of children with this syndrome. In the United States 750–3750 cases of SBS are diagnosed each year, whereas in Estonia only 2–3 cases per year. The incidence rate of SBS is 40.5 cases per 100 000 children below one year of age in Estonia. The study performed by Talvik and co-authors revealed that the majority of the families of these children had economical difficulties (75% of the families received only social benefits, but no salary at the time of injury) (Talvik et al., 2002). These facts suggest that a poor socio-economic situation is one important factor contributing to violence against children. This is confirmed by the data from other research that the people who abuse children have frequently low educational status and more frequently drug and alcohol abusers.

A unique form of physical child abuse is Munchausen syndrome by proxy. In this situation, a parent will purposely either invent symptoms and falsify records (for example, fever) resulting in unnecessary tests, hospitalizations, and even surgical procedures. This psychiatric illness of the parent(s) requires a high index of suspicion, and its consideration is

part of the investigation of any child with recurrent complaints that are not supported by physical or laboratory findings.

3.2 Sexual abuse

Sexual abuse of children is forcing or persuading a child to participate in sexual acts without the child's understanding of the situation. It does not necessarily mean sexual intercourse or physical contact. It also includes incest, paedophilia, exhibitionism and molestation, but also sexual intercourse – urogenital, anogenital or vaginal intercourse with a child. It is difficult to determine how often child sexual abuse occurs, because it is more secret than physical abuse. Children are often scared to tell anyone about the abuse. Many cases of abuse are not reported.

Children become the victims of sexual violence usually at home and from people, who they actually know, most often stepfathers and fathers. Child sexual abuse occurs in all social and economic classes of people. It has the same type of risk factors as physical child abuse, including: alcohol and drug abuse and family troubles. Abusers often have a history of physical or sexual abuse themselves (Johnson, 2007).

In sexual abuse cases, the most important factor is a timely and correct gynaecological examination, but also a correctly taken analysis (sperm). The importance of interviewing the child cannot be underestimated, what they say should be recorded in their own words. When it is possible, the nature of sexual contact should be ascertained. All other parts of the examination are the same as in the case of physical abuse including a complete general examination, recording growth and sexual maturity.

The colposcopic investigation of the anogenital region in girls and anal region of boys is very important, as injuries to the mucosa are not easy to see and with the attached camera, it provides documentation of the examination's findings. The possibility to use a colposcope is available in all four forensic departments in Estonia. Both specialists (gynaecologist, forensic doctor) attend the examination if this is possible, but this is not mandatory. In Estonia forensic doctors are capable of carrying out gynaecological examinations without the presence of a gynaecologist.

If the child is less than 16 years the consent of the parent of carer is needed. If the parents want to have the examination but the child is against this, then the child's wish is taken into account. The child has the right to refuse or accept the parent's presence during the examination.

It is advised that the physical and gynaecological examination is performed by a forensic doctor, but if it is not possible, the doctor on duty has to do it following the same principals.

In cases of sexual abuse, cooperation between the police, social worker, paediatrician and the forensic doctor is very important.

Similarly to the data reported in published papers, the victims of sexual abuse in Estonia are usually younger than 12 years of age, most frequently between three and seven years of age, and two to three times more likely to be handicapped children (Kvam, 2000). During the past two years (2008–2009) Estonian forensic medical doctors performed in total 27 examinations on sexually abused children aged 0-14 years, and the majority of them were girls (girls vs. boys ratio 22 : 5). In Estonia the cases of vaginal and anogenital intercourse are the most frequent, and the cases of incest are also not uncommon. In the cases of sexual abuse it is often hard to evaluate the examination's findings, because injuries usually heal

within a short time period and abnormal findings of the anogenital region may be caused by other factors (blunt force trauma, infection). The problem concerning Estonian forensic doctors is the small number of reported cases giving them very little experience of the problem.

4. External causes of death

In every single industrialized country, injury has now become the leading killer of children.Taken together, traffic accidents, intentional injuries, drownings, falls, fires, poisonings and other accidents kill more than 20 000 of 1–14-year-old children every year in the OECD countries.

Deaths from injury in Estonia form about one third of all deaths to children aged up to 14, this is considerably more than in neighbouring countries. The most pronounced difference between Estonia and other countries in child deaths resulting from injuries are in infant deaths. External causes of death form about one third of all deaths in children 0–14 years old in Estonia. The reduction in childhood mortality shows some progress has been achieved over the recent years.

Year	Injury deaths (V01–Y89)		All deaths,	Total mortality rate per
	N	%	N	1000
2001	56	28.6	196	0.82
2002	40	28.4	141	0.61
2003	44	27.5	160	0.71
2004	31	23.1	134	0.62
2005	40	30.1	133	0.64
2006	31	27.7	112	0.55
2007	29	23.2	125	0.63
2008	27	22.3	121	0.61
2009	17	12.5	87	0.43

Table 1. Total mortality rate per 1000 for all deaths (including injury related deaths) among children, 2001–2009 (Statistics Estonia, 2011)

The annual total mortality rate in Estonia was 0.62 in 2001–2009. During the last few years a decrease has been observed both in the general mortality and injury-related mortality of children (Table 1; Figure 1). In 2007–2009 injury mortality rate decreased from 14.9 to 4.9 per 100 000 among 10–14-year-old children children in Estonia (Figure 1).

From the beginning of 2006 infant mortality has decreased, but less significant progress has been observed for childhood and adolescent deaths. During 2001–2009, 391 children aged 0–14 were autopsied by forensic doctors at the Forensic Science Institute and 310 (79.2%) of causes of death were attributed to the external causes.

The primary external causes of child death in Estonia are various kinds of mechanical suffocation (strangulation, aspiration of foreign bodies or gastric content, drowning, compression). In Estonia asphyxia formed 40.3% of unintentional deaths, followed by mechanical injuries (transport and falls) and poisonings. Drowning and aspiration were the most frequent cause of asphyxia. Strangulation was registered as the cause of death in six cases, with an additional 18 other cases in which the intent was impossible to identify. This group included for example obstruction of the airways with a foreign body, being struck by a blunt object and others.

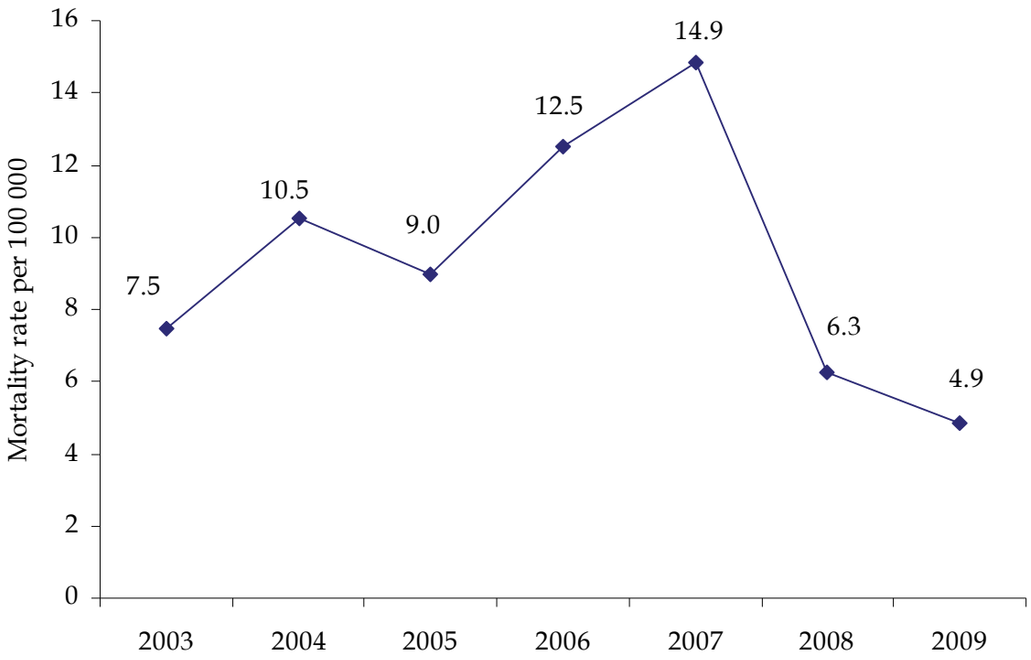

Fig. 1. Injury mortality rates per 100 000 among 10–14-year-old children, 2003–2009 (Statistics Estonia, 2011)

The major problem in Estonia is a high mortality rate from unintentional injuries (accidents) that formed 64.2% of all deaths of children aged 10–14 in 2001–2009 (Table 2).

Intent of death	**Number**	**Column %**
Disease	81	20.7
External causes (injuries)	310	79.3
Unintentional injuries	251	64.2
Asphyxia	125	32.0
Drowning	56	14.3
Aspiration	45	11.5
Strangulation	6	1.5
Other	18	4.6
Transport accidents	80	20.5
Poisoning	24	6.1
Intentional injuries	29	7.4
Homicides, suicides	16	4.1
Intent unknown	29	7.4
Total	**391**	**100.0**

Table 2. Deaths from diseases and injuries among 10–14-year-old children, 2001–2009 (Statistics Estonia, 2011)

Traffic accidents are the leading health threat to children in many countries (Törõ et al., 2011; Durkin et al., 1999). Although the number of traffic accidents has decreased considerably in Estonia in recent years, including also the number of accidents involving children, transport accidents still prevail among mechanical injuries, constituting 25.8% of external causes of death. Most of the victims were from the oldest age group (between 15 and 19 years of age), and 78% were passengers in motor vehicles, 19% pedestrians (most of the cases represent accidents in the home environment where the car reversed over a child) and only one child died as the result of a bike accident. Similar results were also reported in an article comparing the injuries to children who died from traffic accidents in three capital cities (Budapest, Vilnius, and Tallinn) (Törõ et al., 2011).

Poisonings constitute about 7.7 % of all cases of unintentional deaths, and they are mainly caused by carbon monoxide (CO) and medicinal products. Poisonings with medicinal products are usually observed in children one to four years of age who happen to get access to the drugs at home. These include three cases of poisoning with aethazine tablets, and poisoning with dimedrole and amitriptyline. In addition opiate poisoning occurred in a 14-year-old boy and one case of poisoning with unknown gas (presumably butane) was also registered. The rest of the cases represent poisoning with CO in association with fires (seven boys and ten girls).

When looking at the causes of unintentional death by age group, it can be concluded that the decrease in children's mortality has mainly occurred on account of the age group of children below one year of age (Figure 2). In 2005–2009 unintentional infant mortality rate decreased steadily from 85.1 to 31.6 per 100 000. Mortality rates in other age groups have not changed significantly. Analysing the cause of death and manners of death, the main causes of death in children below one year of age include head traumas and suffocation, although the manner of death remains unclear in many cases.

Unclear causes are also apparent in children aged one to four years, but the prevailing causes of death are accidents. The reason for this is a limited availability of accompanying data and therefore forensic doctors have not enough medical data to decide about the form of violence used.

Accidents prevail also in the age groups five to nine years and 10–14 years, the latter group also includes the occasional case of suicide. Similar to other countries a big problem in the case of deaths among children below one year of age is the high rate of deaths from an unknown cause.

Thus, 29 cases of death with an unknown cause were registered between 2001–2009, including nine cases of putrefaction, eight cases of suffocation, one case of poisoning, one fatality in a fire, and 10 cases of mechanical injury, including three unclear cases where the child died during birth.

The task of a forensic doctor is to try to find out whether the injuries detected at the autopsy represent intentional injuries, or whether the child could develop these as the result of an accident. Similar to other countries such accidents happen mostly at home. According to Sengoelge (Sengoelge et al., 2010) home injuries were the leading cause of injury death in children under five years of age in 16 European countries.

Brain traumas are prevailing among the cases of deaths of unknown manner (in nine cases out of ten and one case represented a combined head and chest trauma). In 2001–2009 brain traumas constituted 17.1% (63 cases) of all causes of death in children, first of all in children between one and five years of age.

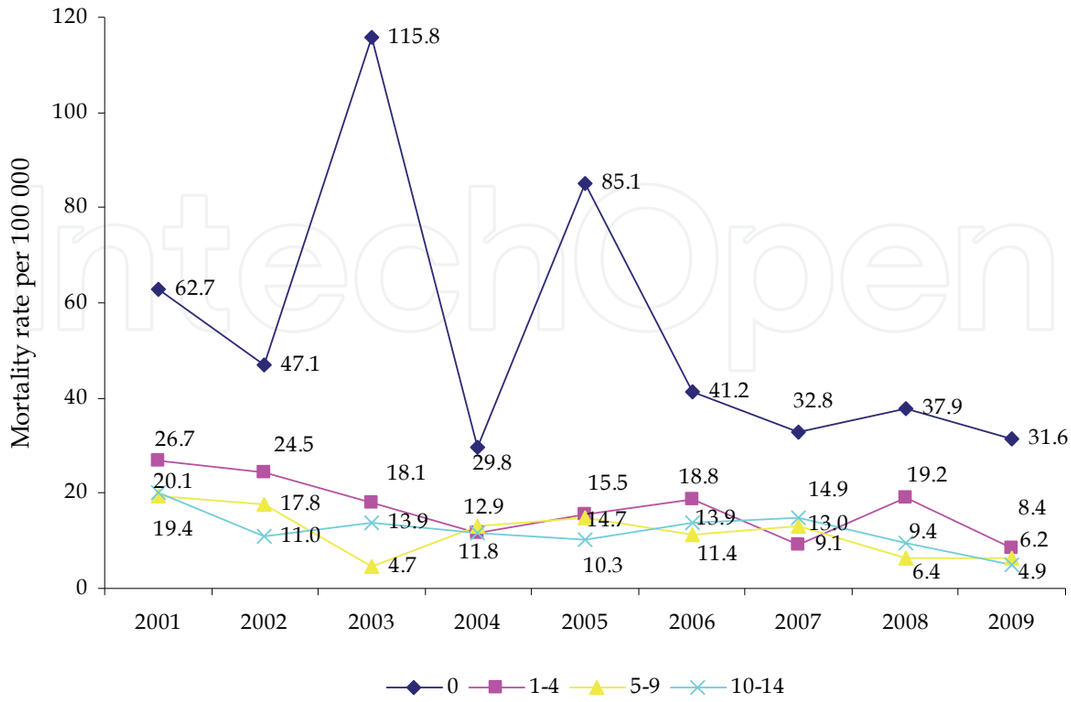

Fig. 2. Unintentional mortality rates per 100 000 by age group, 2001–2009 (Statistics Estonia, 2011)

Forensic doctors are usually able to find out the cause of death in the case of a head trauma, but this is not enough to establish the exact mechanism of injury. For example: A two-and-a-half month old infant was found in a pram, the forensic doctor has found an epidural and subdural haematoma. Question: could the child have fallen by itself?

Second example: a five-month-old infant: linear fractures of both temporal bones, comminuted fracture of the right occipital bone, epidural, subdural and subarachnoid haematoma. Question: mechanism of injury (beating)?

Third example: two-month-old infant: subarachnoidal haematoma in the right frontal lobe, cerebral contusion, major haematoma of the aponeurosis and haematomas of the face.

Question: mechanism of injury (caused by forceful blows with a wide-surfaced object, e.g. hands)?

Injuries from traffic accidents and those caused by blunt objects are commonly the cause of a brain trauma. A forensic doctor finds as the cause of death either asphyxia or head trauma, but this is not enough to establish the exact cause of the injury and determine the manner of death, because of insufficient preliminary data.

The number of youth suicides has decreased in recent years but Estonia still is among the countries with the highest risk of suicide in the world. Suicides were registered in 16 cases in the study years, and the majority of cases were boys (12 cases). Most of the children committing suicide were aged between 10–14 years, but some children were younger (Figure 3). In 2001–2009 the highest suicide mortality rate was 7.5 per 100 000 among 10–14-year-old girls in the first study year.

Fig. 3. Suicide mortality rates per 100 000 among 10–14-year-old boys and girls, 2001–2009 (Statistics Estonia, 2011)

The most common way of committing suicide was hanging, in addition to this one shooting injury and one case of jumping from height were registered. 13 cases of homicide were registered in the study years, and most of these were children below one year of age (eight cases). In 2001–2009, the highest homicide infant mortality rate was 15.4 per 100 000 in 2003 (Figure 4).

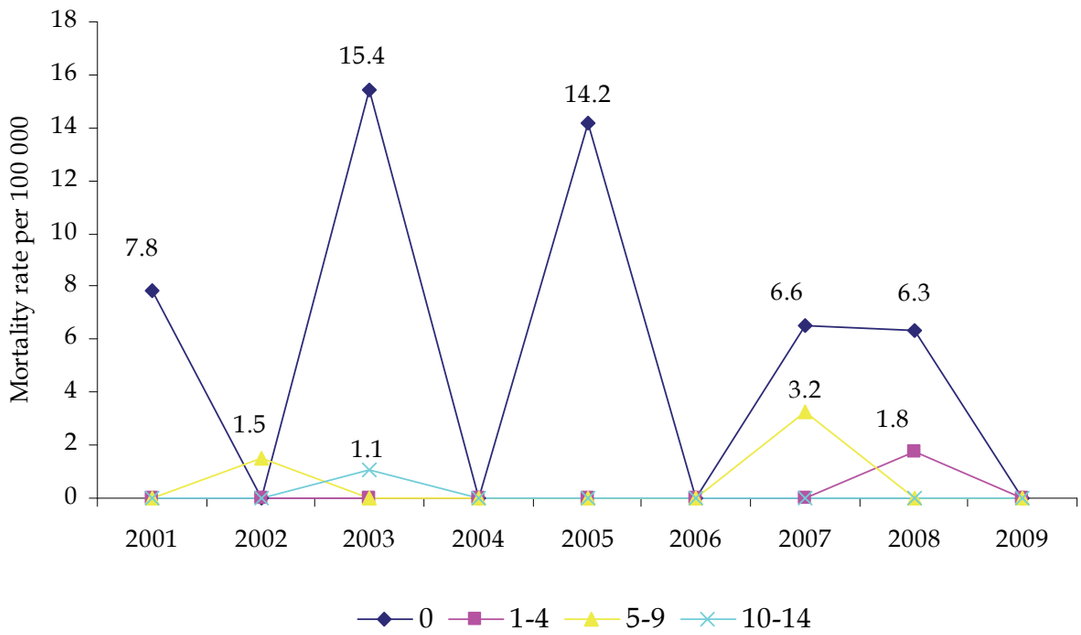

Fig. 4. Homicide mortality rates per 100 000 by age group, 2001–2009 (Statistics Estonia, 2011)

Head injury and choking were the main ways of carrying out the homicide. Two cases include knife injuries, where also the other members of the family were killed (father and one other relative in one case). One shooting injury occurred also in the study years.

5. Conclusion

Reduction of death through injury should be included in the current public health agenda and given a high priority in many countries, including Estonia. It is important to identify the potentially preventable cases and detect risk factors (single parents, young mothers, low educational level, bad living conditions etc), as well as to analyze the incidence and circumstances of different types of violence.

Deaths related to child abuse are preventable and it is therefore important to estimate the amount of such deaths, but also to study the circumstances leading to these deaths. Deaths related to child abuse occurred more often in families that had problems with alcohol abuse, unemployment etc. and/or mothers who had a low level of education.

More information is needed on the circumstances of the violent deaths among children. This would enable not only to correctly classify the manner of death in suspicious cases, but also to eventually reduce the numbers of violent deaths among children.

For adequate assessment of the level of child abuse, it is important to know, who and how evaluates the injuries inflicted on a child, as well as who are the members of the investigation team. Close cooperation between various specialists is essential for the correct diagnosis.

Rates of child mortality from injuries have fallen across Europe. In the former Soviet countries, this is likely to reflect improvements in living conditions since the transition. Child deaths from injuries are avoidable and measures to reduce them would have a significant impact upon the overall burden of child mortality in Europe.

It is important to identify the potentially preventable cases and detect risk factors (single parents, young mothers, low educational level, bad living conditions etc), as well as to analyze the incidence and circumstances of different types of violence. According to published figures more than 50% of cases can be prevented.

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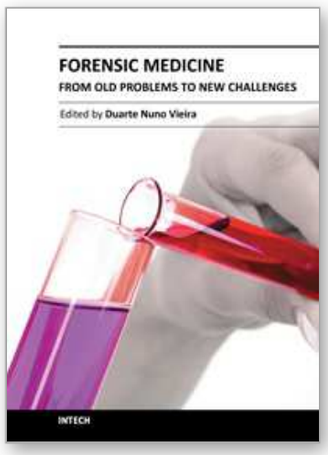

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Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

IntechOpen