Via Spatiosa
Festschrift to Ragnar Andersson on his 67th birthday

Syed Moniruzzaman, Finn Nilsson & Eva Svensson (eds.)

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This book is a tribute to Professor Ragnar Andersson, commemorating his 67th birthday, for his valuable contributions to science. It is a result of enthusiastic cooperation between a number of scientists and experts who contributed with their writings on the topic of ‘injury and risk’.

Although the focus of this book is on injury and risk, it also contains social and environmental aspects that will be of interest also to those outside the discipline. The essays included in the book, whilst only representing a fraction of the available knowledge on injury and risk related topics, signify the importance of this field of science to society and ecology, as well as placing risk and injury in a historical and heritable context. We thereby hope that this book will provide readers with a broader insight on the discipline of risk.

Syed Moniruzzaman, Finn Nilson & Eva Svensson
Karlstad University,
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## Contents

Accidents and Injuries from a Historical Perspective  
*Finn Nilson, Johanna Gustavsson & Carl Bonander*  
4

Child injury mortality in low-income countries  
Trends in transition  
*Syed Moniruzzaman*  
9

Intentional and Unintentional Injuries in Children  
*Staffan Janson*  
16

*Diana Stark Ekman, Robert Ekman & Jan Schyllander*  
31

Risk Management and Consumer Safety Policy  
*Gunnar Larsson*  
48

The bomb attack in Oslo and the shootings at Utøya, Norway, 2011  
Experiences of communication and media management  
*Liselotte Englund*  
55

Parallel tracks enhance workplace health promotion and capacity building for sustainable workplaces  
*Margaretha Strandmark*  
68

Heritage at Risk? The devastating effects of mechanised forestry on local heritage  
*Eva Svensson*  
81
Creating sustainable, contributing research is very rarely a one-man job but more often either a collaboration between individuals or a development of existing ideas. Professor Andersson has, in our opinion, never chosen the egocentric, one-man job approach but rather always opted for an inclusive, open approach, where everyone’s experiences and proficiencies are important ingredients for a successful process. Also, Professor Andersson has, again in our opinion, been especially profound at viewing the issue of public safety from a multi-disciplinary perspective, building on previous research from medicine, engineering, economics and psychology, to name a few.

Professor Andersson’s career has mainly been focused within the injury prevention area and many times has he referred to research now almost hundred years old that supports new, and sometimes revolutionary, ideas. Because of this, we thought it would be suitable that a historical view of injury research should be included in the festschrift. By doing so, we also want to highlight that injury prevention in one sense is an old discipline that has been decisive for the development of mankind. However, injury prevention as a science is comparatively new, and Professor Andersson has been an important actor in promoting its importance and developing a deeper understanding of the field.

ACCIDENTS AND INJURIES FROM A HISTORICAL PERSPECTIVE

Whilst accidents and injuries have occurred since the beginning of time, the importance and explanation of these has changed throughout history. Already in the ancient Roman and Greek scripts, the term accident was used to explain non-essential characteristics in people. Shakespeare, Chaucer and Reyher, meanwhile, used “accident” to depict a situation that occurred by chance or unexpected, alternatively to describe bad luck.

On a scale of importance, it was not until the industrial revolution that accidents and injuries were considered a serious problem. However, this of course doesn’t mean that injuries didn’t occur before this. In fact, it could be argued that injuries, accidents and the prevention of these were most important in the beginning of mankind. One of the first injury prevention ideas was most likely
the use of shoes in order to prevent cuts on feet (Haddon, 1980). Cuts on feet could quickly develop into infected wounds, hindering the hunter-gatherer and, ultimately, lead to starvation.

However, although injuries were important to prevent throughout history, other health issues overshadowed the problems of injuries. According to the “London vital statistics” of 1662, a majority of deaths at that time occurred due to malaria, fever, tuberculosis and plague. Relatively few were due to accidents and injuries (Loimer & Guarnieri, 1996). With the industrial revolution came a change in society where industrialisation increased both the risk of injury and the economic risk interlinked with injuries. This created a necessity for injury prevention and became a driving force for research within the field.

It has been argued that in similarity to injuries being attributed to divine forces, the injured themselves were often seen as the cause of accidents and injuries. Whilst this most certainly is true when the literature is reviewed, it would seem unlikely that this was the complete truth. Had the general attitude towards injuries been of blame, a number of injury prevention products or strategies would never have been introduced. For example, shoes, clothing and armour are all products that mankind has used for thousands of years with the primary purpose of protection against accidents or the cold. There is, therefore, obviously a naturally, inherent will for mankind to avoid injuries. However, with technical and social development the need for organized injury prevention increased.

During the end of the 19th century, accidents and injuries were, at least in academia, often seen as being caused by “the human factor” (Heinrich, 1931). Despite this viewpoint, injuries had started to be noteworthy. The exact cause as to why injury prevention became important is difficult to assess though is most likely a combination of factors. For example, when injuries occurred in factories, the stop in production lead to considerable costs. The price and size of the problem increased in line with increasing wages and the loss of skilled labour. Also, the growth of a workers movement with the establishment of trade unions, lead to a number of protection acts in order to hinder accidents.

The increased need for knowledge concerning injuries meant that the first attempts to categorise and systematically code medical injury diagnoses were taken. Specifically, this occurred in the mid 19th century by William Farr, followed by Jacques Bertillon. The system that was devised categorised injuries based on an assumption that with increased knowledge surrounding injurious deaths, future injuries could be prevented. In the classification system, three causal factors were captured; “human agency”, “mode in which death is produced” and “circumstances in which fatal accidents occur” (McKenzie, Fingerhut, Walker, Harrison, & Harrison, 2012). This system later developed into the International Classification of Diseases (ICD).
With the help of injury classification, the understanding of why an injury occurs is considerably greater today. Pioneers such as De Haven and Stapp, could show through their research that injuries were closely linked to the energy dispersion abilities in the environment around us, as well as the human body’s ability to tolerate forces (De Haven, 1942; Stapp, 1957). A theoretical framework could thereby be created that could be used not only to understand injuries, but also to create preventative strategies. Gordon and Haddon further developed these theories, showing the similarity between injury epidemiology and the epidemiology of infectious diseases, in that injuries also contain an agent (in injury terms, energy), a host (in human safety terms, the individual) and the surrounding environment (Gordon, 1949; Haddon, 1980; Haddon, Suchman, & Klein, 1964). Due to this research, an improved definition of injury could be developed and injury is now generally defined as “the transfer of energy to human beings at rates and in amounts above or below the tolerance of human tissue” (Robertson, 2007). With this definition, not only are violent forms of energy included, but also the absence of energy for example in drowning.

The injury and energy-reducing perspective developed by for example Haddon, Gordon, Stapp and De Haven revolutionised the knowledge and scientific level of safety research. Haddon, for example, introduced the aspects of passive and active safety to represent interventions that were built in (passive) or those that required decision-making (active). This, together with Haddon’s matrix and his 10 injury prevention strategies, has no doubt lead to thousands, if not millions, of saved lives across the world. In its most basic form, the work of the first leading scientists in the injury prevention field lead to two main principles. Either the energy in the accident is reduced or modified, or the resilience of the individual is increased.

These basic principles of energy modification have been the backbone of traffic safety during the past 30-50 years and have been used to develop the airbag, impact zones in cars, helmets, etc. However, unfortunately, these very basic principles have been largely ignored within other aspects of public safety. Professor Andersson has been one of the few that has observed this, working to adopt the principles in other safety aspects such as elderly safety, suicide prevention and fire safety. Particularly within elderly safety and the aspect of fall-related injuries has the injury prevention perspective been absent and the work now being done by our research group (Centre for Public Safety at Karlstad’s University) is in many ways, pioneering. The use of shock absorbing flooring in elderly homes was originally an idea sprung from a discussion between Andersson and Nilson. Although we were not alone in this line of thought, the first global trials, started by our research group, were as a result of studying the problem of fall-related injuries from a multi-disciplinary perspective and adopting ideas from
adjacent areas. The principle is now being tested across Scandinavia and seems to work better than expected, saving and lengthening the lives of elderly people (Gustavsson, Nilson, & Andersson, 2012).

**IS THE TERM ACCIDENT MAKING A COMEBACK?**

During the 20th century, injury and injury prevention became the proposed viewpoint, rather than accident and accident prevention. Accidents were seen as encompassing large and fuzzy events, events that could lead to injuries, but likewise could not (Robertson, 2007). An advantage with the injury definition was that no concern had to be taken to the intent, i.e. it doesn’t matter whether the resulting injury was caused unintentionally or due to violence or suicide, the injury is the same. This meant that focus was on preventing the human suffering from a medical and energy perspective. Whilst it would have been possible to also include aspects concerning accidents, the neo-Haddonist movement, active during the 1980’s and 1990’s, argued, “injuries are no accident”, indicating that by using the accident terminology, a viewpoint of unpreventability surrounded the whole area (Andersson, 2012).

The connotation of the word accident has often been at the core of the discussion for those opposed to the use of the word accident. However, contrary to popular belief, accidents have very rarely been explained as an “act of god”. Whilst the term “act of god” has been used since the Roman times, this has not been to explain specific injuries or accidents. Rather, the term was coined to describe situations or incidents that have occurred and where no individual can be held responsible (Loimer & Guarnieri, 1996). Also, the phrases “an act of God” or similar phrases such as “In sha’Allah” in Arabic, are at least in part purely expressions of language that are not necessarily meant literally. By focusing on these types of aspects, important factors associated with accident research and accident prevention, have been discarded by many.

Professor Andersson was heavily involved in the discussion concerning the use of the term accident or not. Not least due to his involvement in the 1996 “World Conference on Accident and Injury Prevention” in Stockholm where the subject dominated the discussions. For Professor Andersson, knowledge about accidents has always been as important as knowledge about injuries. Whilst an understanding of injury determinants are important in preventative work, an understanding of accident determinants can be as important in order to understand the complete picture. Factors associated with post-traumatic stress for example are as important to include in the analysis of accidents as fractures or traumatic brain injuries, although in todays injury surveillance, post-traumatic stress is not included. Also, from a learning perspective, it is as important to study accidents without injuries as studying those with. Whilst the British Medical Journal still
has a ban on using the word “accident” in their journal, the rest of the scientific community seems to be less clear-cut on the matter. This is especially true in developed countries where the risk of a majority of injury types has decreased rapidly during the last century. In order to continue reducing the negative repercussions of accidents, a wider perspective is needed. Therefore, as suggested by Professor Andersson, it does seem as if the pendulum is returning from a “ban” of using the word accident within this field towards a more inclusive perspective (Andersson, 2012).

Although it was provocative in the injury research community, Professor Andersson named his doctoral thesis “The role of accidentology in occupational injury research” (Andersson, 1991). Now, almost 25 years later, this more encompassing view may be possible to introduce. We would argue that this is typical of the broad mind-set and multi-disciplinary perspective that signifies Professor Andersson’s injury prevention career.

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Child injury mortality in low-income countries

Trends in transition

Syed Moniruzzaman

In the beginning of 21st century, when I first met Professor Ragnar Andersson at Karolinska Institutet (KI) in Stockholm, I appeared with a plan to work with child injury in low-income country (LIC) perspective to which he answered very positively. He encouraged me and supported me to work on the topic. In my journey with him I came to know this was very much him, a person who always welcomes new thoughts and ideas and supports them. Since then we have together published a number of articles in international scientific journals on injuries in the epidemiologic transition perspective. However, child injury in LICs has always been in our agenda.

EPIDEMIOLOGIC TRANSITION
During the past decades, most low-income countries (LICs) have seen important changes in their population health profiles. The mortality levels have declined from very high to low levels in many of these countries, along with decreasing fertility levels. A similar demographic progress has also been seen in high-income countries (HICs), and now the progress thought to be well advanced (Caselli & Graziella, 1994). In HICs, the trends of child mortality started to decline in the 18th and 19th centuries, with the progress of living conditions and healthy practices. The decline of child mortality has contributed to an increase in life expectancy. This process has influenced the population demography where the proportion of elderly people has been seen to increase. The demographic progress on population dynamics has made inevitable shifts in the causes of death, from communicable diseases to degenerative and man-made diseases. However, the demographic progress and the epidemiologic shift that started late in LICs needs to be discussed and is therefore the focus of this paper.

To describe the changing patterns of diseases over a historical progress of society, Omran presented his theory of epidemiological transition in the early 1970s (Omran, 1971). According to Omran’s theory, as society progresses with its economic, environmental and social conditions, the disease patterns shift; the
domination of childbirth and maternal deaths and infectious diseases is gradually displaced by the domination of non-communicable diseases and injuries. This shift has occurred in three clear-cut stages, i.e. the age of pestilence and famine; the age of receding pandemics; and the age of degenerative and man-made diseases. The first stage is characterized by high child mortality, largely infectious and prenatal causes. The second stage is characterized by a decline in infectious diseases and a rise of non-communicable diseases. The third stage is characterized by a domination of cardiovascular diseases, cancers and injuries alongside low levels of child mortality. The determinants of diseases have shifted from socially to medically orientated during the progress of epidemiological transition in HICs.

MORTALITY TRENDS IN DEVELOPING COUNTRIES
In recent decades, substantial progress has been made in reducing infant and child mortality in LICs (You, Jones, Hill, Wardlaw, & Chopra, 2010). However, the global calls for a two-third reduction in under-5 mortality between 1990 and 2015 (Millennium Development Goal, MDG 4) has been a challenge for many countries, especially in some South Asian and sub-Saharan African countries, meaning that they have not met their targets of MDG 4. The global child mortality has shown a substantial declining trend; from 12.5 million in 1990 to 6.3 million in 2013, corresponding to about a 50% decrease (The Inter-Agency Group for Child Mortality Estimation, 2014). The major improvements in various prevention programs such as providing insecticide-treated bed nets for malaria, vaccination programs for measles and tetanus, prevention of paediatric HIV or control programs for mother-to-child transmission and oral rehydration therapy (ORT) against diarrheal diseases have played significant roles in reducing childhood mortality. Yet, infectious and parasitic diseases such as pneumonia, diarrhoea and malaria are key contributors to high child mortality in LICs. Prenatal disorder is still a key childhood killer. Since most efforts have been given to prevent high-prevalent infectious and birth-related disorders, little attention has been shown to the increasing health burden of injuries. Not long ago, injuries were under the shed of infectious diseases and hardly seen as a public health problem. Only very recently, injuries started to draw the attention of public health professionals and policy-makers in LICs.

The late 20th century’s LICs have witnessed huge socioeconomic changes; rapid urbanization and motorization processes have taken place or are still underway. With the changing living environments, coupled with declining mortality due infectious diseases, which have influenced the epidemiologic shift in the current disease patterns, diverging trends in cause-specific child mortality are apparent. Once the mortality decline was started, largely due to reductions of
infectious diseases, it tended to continue more rapidly in LICs than was witnessed during the epidemiologic transition stages in the HICs.

DEViating trends of childhood mortality in Bangladesh and Nigeria
For this paper, distributions of child deaths data due to three major causes for Bangladesh and Nigeria are presented. Percentage of total deaths due to diarrheal diseases, acute lower respiratory infections (ALRI) and injuries among children aged <5 years were obtained from WHO mortality database (WHO, 2013). Between 2000 and 2012, the proportions of total under-5 mortality due to diarrheal diseases and ALRI have declined by 49% and 26% in Bangladesh, respectively (figure 1). Similarly, proportions of total under-5 mortality due to diarrheal diseases and ALRI have declined by 52% and 14% in Nigeria, respectively, during the same period of time. However, proportions of total child mortality rates due to injury causes have shown deviating trends in the both countries, where the share of child mortality due to injury causes has increased by 25% in Bangladesh and 18% in Nigeria.

At the global level, injuries face regional disparity (Alonge & Hyder, 2014). In the age group 1-4 years, 5% of Western African populations contribute to 29% of the global unintentional injury deaths. Similarly, South Asia and Western sub-Saharan Africa together contribute to more than 50% of global unintentional injury deaths among 1-19 years age group. The burden of child injury is upmost in the LICs in Asia and Africa, and the burden is predicted to increase in the future (Deen, Vos, Huttly, & Tulloch, 1999). Drowning, RTI and fires are the leading causes of death from all causes in LICs (WHO, 2002).
DISCUSSION AND CONCLUSIONS
In LICs, traditional sets of diseases such as infectious, parasitic and prenatal conditions are still the major contributors to child death and disability. Child malnutrition is still a great concern to the health of children, and a principal underlying cause of infectious diseases. Poverty in these countries is not yet eradicated, meaning that the low-income region will have to fight against poverty related health problems in the following decades. However, the existing evidence suggests that injury among children is a growing phenomenon, and is expected to become a major health problem among children in LICs. The increasing trends in child injury are not only proportional in that the increases underlie the rapid declining of infectious diseases; they are also expected to increase in absolute numbers. The rapid economic and social changes in LICs may explain the current trends of child mortality. LICs have seen a rapid expansion of urbanization, motorization and industrialization in a very short period of time. This development phase was much longer for industrialized countries. The pace of development in LICs has made it difficult to establish better healthcare system, traffic and communication infrastructures, and to initiate safety policy and regulations.

The high rates of population growth and economic activities are mostly centered to urban settings that make the urbanization process quick and unplanned. Most metropolises are unable to deliver adequate health services. Social services, employment and better housing are limited. Overcrowding, coupled with vulnerable infrastructures and services, makes the environment vulnerable to traffic injuries, interpersonal violence, drug abuse and fire injuries (Berger & Mohan, 1996). Urban slum fires are a common cause of childhood mortality in big cities (Daisy et al., 2001). Children, especially street children, are vulnerable to traffic injuries, violence and abuse. Children are to a large degree working in vulnerable settings such as welding shops and leather and garment industries, common places for severe injuries. The implementation of child policies against child labour is therefore still a great challenge in LICs.
Before the 1980s, motor-traffic communications were rare in rural areas in LICs. The extended road infrastructure and introduction of motor traffic in rural settings makes the environment vulnerable to any kind of traffic accidents. The motor driving laws and traffic controls are considerably more relaxed in rural areas than in urban settings. Novice and reckless motorcycle riders are common on rural roads. The locally made three-wheelers with low-safety control (e.g. Nasimon in Bangladesh) and high-speed cars or microbuses are popular forms of transports, making the whole environment vulnerable to unprotected road users, particularly children. Moreover, most schools are located beside roads that children need to travel along or cross to reach their schools. Traffic warning signs and school indication signs are rare.
The relationship between poverty and unsafe playgrounds, lack of housing and parental supervision, inadequate emergency services, and rehabilitation, is obvious. The poorer population is the most vulnerable to any kind of injuries and, yet, majority of the people in LICs lives close to the poverty line (<1.25 US$). The inability or lack of awareness of the family to provide treatment can result in a small injury leading to severe consequences or even permanent disability, as national health insurance is lacking in most LICs.

“If I have to take my injured kid to a city hospital, it will take three to four days out of my work. Who will earn and provide food to the rest of my family members during the period of my absence?” said 40 years old Rakib, who is a rickshaw puller and lives in a village in Bangladesh, who did not want to take his kid to hospital.

Open cooking places, unprotected and unsafe-placed pesticide, electrification and unsafe playgrounds cause a large number of childhood injuries in LICs. Child drowning is one of the key causes of death in rural Bangladesh, especially among the 1-4 years age group (Rahman, Giashuddin, Svanström, & Rahman, 2006). Small children in rural areas often use rivers and ponds surrounding households as their playground and bathing place. Without supervision these children are at high risk of drowning.
National data on child injury is lacking in most LICs. Most data on injury comes from vital surveys or regional surveys, as well as small studies. However, these data provide valuable information on child injury mortality. Morbidity data on injuries are so dispersed and still are lacking professionals and policy makers’ attention. While the target of MDG goal 4 is somewhat progressing, with declining infectious and prenatal diseases, a new epidemiologic pattern of child mortality has been projected. With the change of socioeconomic status, urbanization, and motorization, an increasing trend of injury mortality among children is observed in LICs. This epidemiologic shift in child mortality requires further attention, in order to understand the aetiology and mechanism of the transition of childhood disease and disability.

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Intentional and Unintentional Injuries in Children

Staffan Janson

CHILD INJURIES IN A GLOBAL AND EUROPEAN PERSPECTIVE
Child injuries are a growing global problem, even though they are decreasing in high income countries. Globally it is a significant area of concern from one year of age and contributes progressively to overall rates of death until children reach adulthood. Hundreds of children die each year from injuries and violence, and millions of others suffer the consequences of non-fatal injuries. While injuries stand for a few percent of infant deaths it constitutes almost fifty percent of the mortality in the ages 15-19 years (WHO 2008). The main injury areas are road traffic injuries, drowning, burns, fall, poisoning and violence. For each of these areas there are proven ways to reduce both the likelihood and severity of injury. In several high income countries, specifically those in northern Europe, evidence based preventive actions since half a century has remarkably reduced child injuries. On a global level, however, the awareness of the problem and its preventability, as well as political commitment to act to prevent child injury, remain unacceptably low.

Even if the fatal child accidents in our part of the world have decreased substantially, around 3 000 children are still dying each year in the European Union (27 countries). This means that one child in Europe dies every hour every day. Injury is the leading cause of childhood deaths in the EU, accounting for 28% of all deaths of children between 1 – 14 years of age. Already from infancy boys are at a higher risk of incurring a fatal injury than girls. At the age of 13 boys are almost twice as much at risk for incurring fatal injury than girls.

There are considerable differences in the injury fatality rates of children between EU member states. For example, injury fatalities in children accounts for 19% of the total number of deaths in the United Kingdom, 23% in Sweden and staggering 45% in Lithuania and 44% in Estonia. This means that there probably still are great disparities both in socio-economic resources and in the implementation of good practices within the EU.

Also in Europe five external causes of injury – road traffic, drowning, violence and neglect, falls (from height) and fires – account for 62% of all fatal deaths up to 14 years. These five main causes are known to be preventable by appropriate
measures, improved parental skills and supervision and a wider application of child restraint systems, pool fencing, smoke alarms and window guards (EuroSafe 2013).

The Netherlands leads Europe with the lowest rate of deaths from injury among children and adolescents in the most recent year available (most often 2010) with 4.99 deaths per 100,000 children 0 – 19, followed by Sweden (5.02), the UK (6.01) and Germany (6.16). The worst performing country is Lithuania (23.9) followed by Bulgaria (17.37) and Romania (17.20). Finland is the country that has adopted most of the EuroSafe’s recommended safety measures, and Greece is the country that has implemented the least. Less than half of the EU countries have bicycle helmet law for children, less than half a law requiring resistant packaging of medications and one fourth only requires barrier fencing of private pools. No country has a law requiring children to use a rear facing child passenger restraint to age 4, although this is normal practice in Sweden, where child passenger deaths in this age group have been reduced to almost zero (Kmietowicz 2012).

UNINTENTIONAL INJURIES AND SOCIO-ECONOMIC STATUS
Injury risks during childhood and adolescence vary depending on socio-economic factors, a pattern that holds true around the world. Studies reveal that children in low socio-economic status (SES) families or children living in poorer neighbourhoods in low to middle-income countries are more often the victims of unintentional injuries than children from high SES families or children living in more affluent areas (Östberg, 1992; Carey et al., 1993; Gissler et al., 1998; Cubbin et al., 2002; Hjern et al., 2002; Blakely et al., 2003). Earlier studies of SES factors, usually relating to non-mortal injuries in children living in high-income countries have, however, showed complex patterns. Some studies report an increase in injury rates with decreasing SES (Faelker et al., 2000; Gilbride et al., 2006) while others show higher risks for non-fatal injuries among children from high SES families (Ni et al., 2002). Other research has found associations between children and adolescents with lower SES and traffic related injuries (Poulos et al., 2007) and injuries related to interpersonal violence (Pickett et al., 2005; Simpson et al., 2005). Sports and recreational injuries among children and adolescents have been associated with higher SES (Ni et al., 2002; Potter et al., 2005; Simpson et al., 2005). Diverging results can partly be explained by methodological approaches, depending on the types of injuries, ages and countries of the studied populations and socio-economic indicators studied (Potter et al., 2005; Shavers, 2007). Socio-economic differences among children who experience unintentional injuries also vary within countries. In Canada, for example, research on injury morbidity in 0-19 year old children found a consistent relationship between poverty and injury...
(Faelker et al., 2000). Another study set in Australia found that children aged 0-14 years old who belonged to the most disadvantaged group were more likely to be hospitalised than children in the least disadvantaged group (Poulos et al., 2007). A study from England found that children below 16 years of age from the most deprived areas had three to five times higher risks to be hospitalized due to various road traffic injuries, compared to children from the least deprived areas (Edwards et al., 2008).

Compared to international studies, however, Swedish studies of socio-economic distributions of children’s unintentional injuries generally show relatively small differences in injury outcomes. A Swedish study in the early 1990s analysing social differences related to injury hospitalisations of 0-15 year olds found negligible differences for fall injuries. However, the same study demonstrated that children from the lowest SES strata experienced 40 percent higher risks for traffic related injuries compared to children from the highest strata (Engström et al., 2002). Children living in areas characterized by “moderate” and “high” deprivation were found to have pedestrian injury rates significantly higher than their counterparts in areas with low deprivation. However, this same study found significantly lower rates for bicycle related injuries and vehicle occupant related injuries for children in more deprived areas (Reimers et al., 2005).

THE HIDDEN INTENTIONAL INJURIES
Hidden within the scope of injuries are the intentional injuries, which often pass by unrecognized. There are many reasons to hide intentional injuries or present them as unintentional. Such reasons can be that (at least severe) child maltreatment is a criminal offence in most countries and self-inflicted injuries are often associated with shame. A substantial part of unintentional injuries are never classified as intentional, as they happen in situations where children are severely neglected by their families, teachers or are exploited in work situations. Health workers in many countries are not aware of that injuries can be caused by intention or disregard children’s statement.

There are consequently many obstacles for accurate diagnosing and classification of intentional injuries, complicated by the mixed interrelation between intentional and unintentional injuries in children and adolescents. Among the difficult questions to answer are the following:

- How common are intentional injuries (violent and self-inflicted injuries) in different geographical, socio-economical and ethnical settings?
- Are unintentional injuries more common in children with intentional injuries?
• What are the main risk factors for the combination of unintentional and intentional injuries among children?
• Is it more common with unintentional injuries in children, who are subjected to child abuse, neglect, bullying or other types of humiliation?
• Shall injuries caused by weak supervision i.e. neglect, be looked upon as a form abuse?
• Can unintentional injuries be distinguished from intentional with a sufficient degree of certainty?

Our Swedish research group on child abuse and child injuries have tried to demonstrate and tackle some of these problems in a number of studies and this chapter is partly based on some of this work concerning intentional injuries in drowning (Schyllander et al 2013), their relation to socio-economic position (Nyberg et al 2012) and the most probable frequent occurrence of unintentional injuries in maltreated children (Tindberg et al 2014).

The last of the six questions above concerning the distinction between intentional and unintentional injuries has been extensively discussed in the scientific literature (Kemp et al 2008) and is not the topic of this chapter. However it is well known from the international literature that victims of serious and substantiated physical abuse and neglect have changed ambulatory care providers with greater frequency than non-abused children, meaning that their families often moves around in different areas. The consequence is interrupted continuity of care and greater difficulties to observe and react on suspected child abuse (Eron et al 2005). There are also unfortunately great difficulties to screen children for intentional injuries with a high degree of accuracy at emergency departments (Woodman et al 2009), but the inclusion of a simple reminder flow-chart may increase the awareness, consideration and documentation of intentional injury (Benger & Pearce 2002).

INTENTIONAL INJURIES AND SOCIO-ECONOMIC POSITION
A number of studies of intentional injuries in children have found links between socio-economic conditions like low income levels and single parenthood, and self-destructive actions and violence-related injuries among adolescents ages 14-15 (Gould et al., 1996; Fergusson et al., 2000; Tomori et al., 2001). A Canadian study found that self-reported violence-related injuries in 11-16 year old children were consistently associated with poverty. In this study, children in the lowest SES category experienced almost five times higher rates for injuries caused by interpersonal violence, compared to adolescents from the highest SES category (Simpson et al., 2005).
Earlier Swedish studies have found higher injury-related hospitalisation risks in adolescents from low SES families, compared to those from high SES families. Findings from the early 1990s showed that children aged 10-19 years who lived with single parents had sixty percent higher risks for both self-destructiveness and for violent crimes compared to children who came from families where they lived with a mother and the mother’s partner. Boys and girls from families that received social welfare benefits had three times higher risks for injuries from self-destructive behaviour and interpersonal violence (Engström et al., 2004). Another Swedish study investigated the risk for intentional injury hospitalization among children and young adults with single parents and found that males and females aged 13-26 years who came from families with single parents had elevated risks for suicide and for injuries due to intentional violence (Ringbäck-Weitoff et al., 2003). Overall one could say that socio-economic background factors are the same for both intentional and unintentional injuries in children and adolescents.

ETHNICITY
Ethnicity, as viewed by immigrant status, may be a risk factor for children’s injuries in Sweden. Until the mid-1980s, the majority of immigrants to Sweden came from other countries in Europe, primarily in order for a family member to work. A shift in immigration policy has had the result that most immigrants to Sweden, apart from those who come to the country to join family members, are either refugees or asylum seekers. Studies have indicated that adolescents from ethnic minorities may experience elevated risks for self-harming behaviour (Bayard-Burfield et al., 1999) and intentional injury mortality (Pressley et al., 2007).

INTENTIONAL AND UNINTENTIONAL CHILD INJURIES IN SWEDEN 1990-2004
We performed a retrospective case-control study (Nyberg et al. 2012) using national data from the in-patient register, maintained by the Swedish Board of Health and Welfare. The patient register was linked to socio-economic data from Statistics Sweden. Sweden’s National Patient Register (NPR) registers offer good opportunities to study the effects of morbidity and mortality, compared against the social and financial factors represented in large populations. Both registers offer almost complete population coverage, which allows individual record linkage between the data sets. The NPR contains information about 99% of all patients cared for in hospitals during a specific year, with injuries classified according to the WHO ICD 10 classification system. Quality assurance has shown that causes of injuries are registered in 97% of all injury cases reported by the NPR (National Board of Health and Welfare, 1998).
The study also linked data about children included in the study population to data about their mothers and their mothers’ partners, using Sweden’s Multi-Generation Register. Children who could not be linked to a parent (768 children) were excluded from the study population. Information about each child’s household’s socio-economic measurements were obtained by the linkages between the children in the study population and the Total Population Register (RTP) and the Education Register from the years 1990, 1995, 2000 and 2004.

The NPR data was screened to obtain hospitalisation records for all boys and girls between the age of 0 – 19 who had been hospitalised for more than 24 hours due to traffic injuries, fall injuries, other unintentional injuries, or due to self-inflicted injuries or and interpersonal violence during the years 1990, 1995, 2000 and 2004 (N = 71 132).

The total number of children in the final study population was 51 225, whereof 30 027 (58.6%) were males and 21 198 (41.4 %) females. The study then set up a protocol using individual-matched control group including four controls per case, which represented 204 900 not hospitalised children, who were matched on year of birth and sex selected from the national Population Registry.

**Trends in injury rates**

Overall, injury rates decreased during the period 1990 - 2004. During the period 1990 – 2004, fall injuries caused nearly two thirds of the in-patient care occasions for the study population followed by traffic injuries (25 – 32%), self-inflicted injuries (7%) and interpersonal violence (2%). The rates for adolescent girls who were in care for self-destructive behaviour increased over the study period while the rates for traffic injuries decreased among both boys and girls in all age groups.

**Single parents**

Over the study period, children living with single parents were at higher risk for hospitalizations due to injuries compared to children who lived with a mother who had a partner living in the same house. The strength of the relationship between family composition and injuries varied according to types of injury, and sex and age of the hospitalised patients. Adolescents living with single parents accounted for the largest increases in risk for self-inflicted injuries and violence related injuries over the study periods. Adolescent females living with single parents experienced risks for hospitalisations due to self-inflicted violence that were two to four times higher than the risks occurring to girls living in homes with mothers and partners. Adolescent boys living in homes with single parents were at greater risks for both self-destructive acts and violence related injuries, compared to counterparts living in homes with mothers and partners. These correlations varied in strength (OR 1.2 – 3.0) over the study periods. Both sexes of
preschool age (0-6 years) and in the oldest age groups, 18-19 years, children living with single parents were at higher risk for traffic injuries compared to children from families where both a mother and her partner were present.

Families on welfare
Adolescents in families on welfare had significantly higher risk for hospitalization due to intentional injuries compared to their peers. During the period 1990 – 2004, adolescent girls in families on welfare had two to three times’ greater risk to be hospitalized due to self-destructive acts than girls from families not receiving welfare. Boys in families on welfare had double the risks for in-patient care following self-inflicted injury and violence related injury compared to other boys of the same age. The relationships between household income sources (household income, and-or social welfare) and injury-related hospitalisations were insignificant when all socio-economic factors were included in multivariate analyses.

Socio-economic factors
The major finding of this study was that socio-economic factors were consistently associated with children’s hospitalisations due to injuries throughout the study periods, despite decreasing injury rates as a whole in Sweden. Children and adolescents in families relying on social welfare benefits, and those living with single parents and mothers with less education were consistently at higher risks of injuries leading to hospitalization, compared to peers from other households. While traffic injuries decreased in all age groups over the study periods, we found consistently elevated risks for hospitalisations due to traffic injuries for pre-school children living in families with single parents. For older children aged 7-17, traffic injury related hospitalisation risks were 10-30 % higher for children living in families with single parents and for children living in families receiving social welfare benefits (Engström et al., 2002).

Our study reported negligible differences in risks for fall injuries between socioeconomic groups among preschool children and no association for children aged 7-17. The results supported those of an Australian study, which did not show a consistent relationship with SES and of previous Swedish studies that also found negligible or small associations between SES and fall injuries (Engström et al., 2002; Weitoft et al., 2003).

While traffic injuries decreased in all age groups since the year of 1990, we found a constant twofold risk for traffic injuries among pre-school children to single parents. In older children, aged 7-17, traffic injury risk were 10-30% higher in children to single parents and to families on welfare. Socioeconomic status has been identified as a risk factor for traffic-related injuries in other studies. For instance, a study in Canada found that traffic injuries were 51% higher among chil-
dren in the lowest income category compared to those in rich families (Faelker et al., 2000) and a previous Swedish study found rates for traffic injuries in 10-19 years old to be 20-50% higher in neighbourhoods with lower family incomes, compared to others (Engström et al., 2002).

**Intentional and self-inflicted injuries**

Socio-economic status had the greatest effect on the risk of intentional and self-inflicted injuries. Our findings are in line with earlier findings from Sweden and abroad (Engström et al., 2002; Ringbäck et al., 2003; Engström et al., 2004; Pickett et al., 2005; Simpson et al., 2005; Ringbäck et al., 2008).

Self-inflicted injuries were three times more likely to occur among adolescent females compared to males. These injuries increased among adolescent females (while hospitalisation rates for adolescent males have been relatively constant) over the study periods. Public health concerns about this self-destructive behaviour by adolescent females have been brought to attention nationally and internationally (Cleaver, 2007; Reimers et al., 2008). Our study revealed more about the specific SES factors associated with this injury: adolescent females living in families receiving social benefits and/or headed up by single parents consistently demonstrated more than two-fold increased risks for hospitalisations due to self-inflicted injuries compared to other girls of the same age. These findings are consistent with other studies which have shown that children growing up in families with receiving long-term social welfare benefits have less satisfactory outcomes regarding indicators for mortality, suicide attempt and alcohol misuse (Weitoft 2008). Other studies have shown that children living with single parents demonstrate increased risks for suicide attempt (Wadsworth et al., 1983; Roberts et al., 1995; Engström et al., 2002; Weitoft, 2003; Engström 2004). Our findings that males and females living in homes where both parents were born outside Sweden were not at higher risk for self-inflicted injuries compared to adolescents who have one or both parents born in Sweden, is in line with earlier national studies (Engström and LaFlamme, 2002; Engström et al., 2002; Engström et al., 2004; Jablonska et al., 2009).

**Interpersonal violence**

We found considerable differences in risk for interpersonal violence among males ages 13-17. Males living in families receiving social welfare benefits and living with single parents had more than twice the risk to be hospitalized due to interpersonal violence, compared to other males. This finding corresponds with earlier Swedish research which has shown that adolescents living in families headed by single parents have an increased risk for violence related injuries compared to adolescents from families where parents are partnered, after taking socio-economic...
factors into account (Weitoft et al., 2003; Engström et al., 2004). Canadian studies have shown a positive correlation between low SES and injuries due to interpersonal violence among adolescents (Pickett et al., 2005; Simpson et al., 2005).

The population-based Swedish safety work seems to have had only minor effect on reducing the impact of SES-related risks as they mainly affect injury-related hospitalisations to younger Swedes. This is particularly noticeable when it comes to intentional injuries. Even though, overall, decreases were seen in the number of adolescents who have been victims of violent crimes during the last decade, there is still a significantly higher risks for hospitalisations due to injuries from interpersonal violence, particularly for adolescent boys who live in families headed by single parents and-or who live in families receiving social welfare benefits, compared to other adolescents. The same socio-economic differences are true for self-inflicted injuries among females of younger ages.

There is no reason to think that child injury prevention efforts are not being provided in areas with many high-risk families, as these services are standardized and regulated at national levels. In addition, most services available from local health care clinics, well-child services, day-cares and schools are regulated at the national level, and are provided, for the most part, either free of charge or at substantially reduced prices. Either these preventive efforts are not reached or understood by low income families or other risk factors are more important.

UNINTENTIONAL AND INTENTIONAL DROWNING
In another study (Shyllander et al 2013) we explored circumstances surrounding each drowning death occurring to children and adolescents ages 0–17 in Sweden during the years 1998–2007. Records from the National Board of Forensic Medicine (NBFM) and other sources were analysed. We collected information on children’s personal characteristics (sex, age, ethnic background, weight, height, physical condition, and pre-existing health conditions) and the circumstances of deaths (time and place of occurrence, type of drowning, resuscitation efforts and medical care given, for example). We also collected information on prevention factors: the physical environment, adult supervision, whether or not the child could swim, and if the child was using a personal flotation device at the time of death. Our analysis showed that 109 children had drowned in Sweden during the study period – of this group, 96 had died from unintentional causes. Children from immigrant backgrounds, particularly with families coming from the Middle East and Iran, were inordinately represented in the group of victims who had died from unintentional drowning deaths. Other risk factors included: coming from a single parent-headed family, alcohol use by older victims and a lack of ability to swim. However, there were another 10 children drowning, where four cases were due to suicide, four result of murder and another two with unsettled intent. All
the children committing suicide were between 15 – 18 years, while the murdered children were younger. There is obviously a reason to extensively investigate drowning in children for violent crime, when there is no easily explained reason for the incident (Janson et al 2010).

ABUSE AND UNINTENTIONAL INJURIES
As mentioned initially a major public health issue, hidden within the frame of injuries, is physical abuse of children (Gilbert et al 2009, Pinheiro 2006). With more than 30 years of banning of child physical abuse (CPA) in Sweden, the prevalence of corporal punishment is relatively low. Still, CPA is affirmed by 12 – 16 % of school children in anonymous population based surveys. It is also known that there is a substantial overlap for CPA and other forms of child maltreatment and victimization (Svensson, Bornehag & Janson 2011, Annerbäck et al 2012).

Recognizing and understanding the cause of injury by health care personnel is crucial for the preventive work aiming at limiting different types of injuries in- and outside home. As mentioned above, many socio-economic factors including parental drug and alcohol problems, but also child attributes like hyperactivity and bullying are the same for unintentional and intentional injuries in children (Morongiello et al 2006, Spinks et al 2008, Engström et al 2008).

Abuse and injuries in Swedish school-children
Repeated Swedish national studies on child abuse have shown an association between corporal punishment and self-reported injury events (Janson et al 2011). This topic has been further analysed from the last study in 2011 including questionnaires to 3207 children in grade 9 from 92 schools all over Sweden (Tindberg et al 2014). In total, 569 (18%) school children reported some kind of physical abuse (CPA) at home during childhood. Severe CPA, such as having been beaten severely by hand or device, been kicked, been burned or scalded, was reported by 5%. Three percent reported having been beaten by an intoxicated parent. Witnessing partner violence (WPV) was reported by 7%, or one in four (n=142) of school children having reported CPA. Being bullied by other children or having bullied themselves, at school or elsewhere, was reported by 30% of the children (Table 1). Having the experience of being both a bully and a victim was reported by 13%.

In the 2011 school-children study we found strong associations between self-reported physical abuse (CPA), witnessing partner violence (WPV) and other forms of maltreatment to multiple injurious events in the last year with odds rates varying between 1.6-4.6 after adjusting for demographic factors, and repeated need of injury-related healthcare with adjusted odds rates of 1.4-4.9. Having reported WPV, being locked up at home, feelings of being neglected, experience
of bullying, poor family economy and chronic conditions all had an enhancing effect on the association between corporal punishment and injuries that might have required healthcare.

One in four Swedish 15-year-olds reported one or more injuries or poisonings during the last year, whereof a third reported multiple injurious events. The 2011 study did unfortunately not have information on different types of injuries. It is however known, that the injury pattern for adolescents, as compared to preschool and younger school children, change according to a more experimental and sometimes risk-taking behaviour that might include motor vehicles, drugs and interpersonal violence (Currie 2008, Heron 2008, Engström et al 2005), while other young persons are injured during sport activities (Currie 2008). Poisonings, that most often are unintentional in younger children, turn to be predominantly self-inflicted among teenagers (Ramisetty-Mikler, Mains & Rene 2005). A third of our surveyed school children reported that they, at some time while growing up, had needed healthcare due to an injury or poisoning, whereof a third had needed this more than once.

We found that 18% of the 15-year-olds reported CPA at home. One in four had been severely abused and 28% had witnessed inter-partner violence, consistent with the known overlap of victimizations (Annerbäck 2012, Hamby et al 2010, dong et al 2004). In addition, 30% of the school children had experiences of being either a bully or a victim. These markers of abuse and maltreatment, at home and/or at school, were significantly associated with reports of both injurious events the last year and need of injury-related healthcare at some point during childhood. Being victimized by peers in the school environment is known to have long-term effects on mental health, but is also believed to work as a short-term injury trigger. Disturbed concentration and attention is suggested to result in peripheral narrowing and slower vision reaction time during stress and consequently higher risk of injury (Engström et al 2005).

Alarming findings were the strong associations between psychological maltreatment and injuries that might need healthcare. A strong association was seen for ever having been locked up at home, i.e. psychological abuse, where a substantial overlap was seen with 68% of children having been locked up also reporting corporal punishment. A similar pattern was seen for witnessing parental violence alone or combined with CPA, tending to have a stronger correlation to both injuries the last year and injury-related healthcare contacts during childhood than CPA alone when compared to non-abused. Our findings correlate with previous results showing that CPA in combination with WPV is more likely to result in injuries or injuries requiring healthcare compared to non-WPV cases (Hamby et al 2010).
Having been called stupid by a parent, a marker of psychological verbally aggressive behaviour was also associated with both multiple injurious events and repeated injury-related healthcare contacts. Pupils reporting feelings of parental neglect were overrepresented among those reporting injurious events but not among those with repeated injury-related healthcare. One theory is that these children might not have been helped to healthcare to the same extent as children feeling that their parents care about them. This is supported by other’s findings that emotional and physical neglect are associated with both abuse and household dysfunction (Dong et al 2004).

Like others, we found that injurious events were correlated to male gender, poor family economy (Laflamme et al 2010, Engström et al 2002, Gilbert et al 2012), living with a single parent (Weitoft 2003), bullying (Engström 2005) and chronic conditions and ADHD (Morongiello 2006, Spinks 2008). An enhancing effect of CPA for injuries that might have needed healthcare was seen both for poor family economy, bullying, chronic conditions, ADHD, WPV and markers for psychological abuse, psychological aggression and neglect. This pattern is in line with previous reports on the interrelatedness between maltreatment of children and social circumstances during childhood and adolescence (Annerbäck et al 2012, Hamby et al 2010, Dong et al 2004). Our contribution to the understanding of the complexity of unintentional and inflicted injuries in children is that all the studied adverse explanatory factors had an enhancing effect on CPA for the risk of multiple injurious events and/or repeated need of injury-related healthcare.

SUMMARY AND FINAL COMMENTS
Both international and Swedish studies indicate that intentional injuries in children are more common than usually understood. Intentional injuries are often missed due to low professional awareness and even when suspected there are often great difficulties to assess intentional injuries with a high degree of accuracy.

Poverty (absolute and relative), single parenthood, alcohol and drug abuse as well as other social problems increase the risk of injuries and these risk factors are overall the same for intentional and unintentional injuries. The major finding in one of our own studies was that socio-economic factors were consistently associated with children’s hospitalisation due to injuries throughout the whole study period 1990-2004, despite decreasing injury rates as a whole.

Children of single parents in Sweden (as well as abroad) have higher risk for both self-destructive and violent injuries. They also have elevated risk for suicide in adolescence. Self-destructive behaviour is particularly common among adolescent girls while boys are more involved in physical violence. Children of parents
born outside Sweden were not at a higher risk for violent or self-destructive
behaviour compared to children of Swedish born parents.

Preventive efforts in Sweden are principally the same to all families in Sweden,
independent of their socio-economic circumstances. Either these preventive
efforts for different reasons do not reach families in economic or social troubles
or other risk factors are more important and need to be cared for by more general
societal interventions like reduction of relative poverty.

The United Nations Convention on the Rights of the Child (WHO 2008),
declare that children and adolescents need special consideration to safeguard
their right to health and to a safe environment, free from injury and violence.
WHO further states that no violence against children is justifiable and all forms
of violence are preventable (Pinheiro 2006). The present findings of strong asso-
ciations between different forms of maltreatment and increased injury prevalence
in adolescence calls for continued efforts to limit this risk of injury.

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ABSTRACT
This study analyses temporal trends associated with the incidence of bicycle-related injuries resulting in hospitalisations of 24 hours or more in Sweden, for the years 1987 through 2011. Age-and-injury category specific hospitalisation rates for the study years for the different study populations were analysed using the Joinpoint regression program. This method assesses annual percent changes of these hospital rates. While the strongest decrease in annual percent changes related to hospitalisation rates occurred during the first part of the study period for head injuries to children under 15, annual percent changes related to other hospitalisation rates for head injuries show decreases, as well. Many of these decreases were occurring well before implementation of helmet laws for children in 2005. However, the annual percent changes related to hospitalisations due to injuries to body areas other than head and concussion have either shown no significant decrease, or have increased, for the largest age groups, adults ages 25 and older. The study identifies prevention of serious injuries to body areas other than head as an important aspect of bicycle safety work in Sweden.

INTRODUCTION
Road traffic injuries are a leading cause globally of injury mortality and morbidity. Shared use of roads by four-wheeled vehicles, busses, trucks and other heavy vehicles, moving at fast speeds, creates risk for more vulnerable users, including pedestrians and bicyclists. In higher income countries, motorcyclists, bicyclists and pedestrians have higher fatality rates than other road user groups due to the limited protection that bicycles and other non-motorised vehicles provide against heavier vehicles (WHO, 2004). The injury risks facing bicyclists in road traffic in high-income countries varies by region: in the Netherlands, where bicycling is a common form of transportation year-round, about 20% of all road traffic fatali-
ties occur to bicyclists. In Japan, bicyclists comprise about 10\% of all road traffic fatalities, while in the US, about 5\% of all such fatalities occur in bicyclists. The regional variations that are seen in these fatality rates indicate that social factors, including bicyclist behaviour, and governance of safety regulations, and physical factors, such as road design, play roles in shaping these differences (WHO, 2004).

Bicycles are a popular means of transportation in Sweden. The national trade organization of Swedish bicycle manufacturers and importers estimates that approximately 550 000 new bicycles have been sold annually over the past few years (Svenska Cykelfabrikant och Grossistföreningen, 2013). Swedish national policies for public health and road use promote bicycling in the general population, and policies focus on safer road designs for these bicyclists (Statens offentliga utredningar, 2012). These policies are associated with a stable group of bicyclists around Sweden. A national survey showed that bicycling has increased by 36\% from five years previous. The survey found that nearly a third of the population rides bicycles at least once a week, with an average trip of about three kilometres. During warmer months, an estimated 20\% of the population uses bicycles four or more times a week, to ride to work or school. In the winter, 20\% of the population still bicycles at least once a week, with about ten percent of the population bicycling at least four days a week to work or school, around the year (Sifo, 2012).

Sweden’s national framework of policies, regulations, and environmental modifications to the traffic environment, commonly called Vision Zero, began with legislative support in 1997 (Belin et al., 2012). The goal of Vision Zero is to reduce traffic-related deaths and serious injuries to zero. Over the following decades, Vision Zero has led to extensive changes in road design that promote bicycle safety, including better crossing zones for bicyclists and pedestrians, traffic calming devices in high use areas, and separated bicycle lanes in many localities.

Bicycle helmet use has been a focus of bicycle safety efforts in Sweden, and elsewhere, because of the association of bicycle riding to head and brain injuries, including fractures and concussion. A study by Cripton et al. (2014) set in North America found that about two-thirds of all bicycle-related fatalities, and three-fourths of all bicycle-related admissions, were due to head injuries. One of the main components of bicycle safety for children under the Vision Zero framework is the mandatory requirement for bicycle helmet use for all bicyclists under the age of 15. This law was implemented on the national level in 2005.

As a result of ongoing safety efforts on local and national levels, overall bicycle-related fatalities are quite low in Sweden decreasing from 0.49 per 100 000 in 1997, to 0.21 per 100 000 in 2011 (National Board of Health and Welfare, 2013a). The focus now should be on preventing serious injuries resulting in hospitalisations to bicyclists. How well do bicycle safety measures work in preventing
these serious injuries? In order to evaluate the impact of bicycle safety measures in reducing serious injuries over time, it is important to first understand when changes in hospitalisation patterns occurred. Analyses of temporal patterns can help identify periods when significant changes in hospitalisation rate trend directions have occurred. Use of percentage changes over time in utilisation of health care services provides an intuitive, and easily understood, approach to this type of analysis.

The aim of this study, then, is to analyse and describe patterns associated with annual percentage changes (APCs) of hospitalisation rates per 10 000 population for patients who were hospitalised for 24 hours or more, due to bicycle-related injuries in Sweden, over the study period 1987-2011.

METHODS AND MATERIAL

Study definitions
This study uses rates per 10 000 population for bicycle-related injuries resulting in hospitalisations of 24 hours or more as the base for analyses. Rates were derived by first analysing cases, which were defined as hospitalisations due to injuries that occurred while riding a bicycle. These cases were identified by the International Classification for Diseases (ICD), which is used to label hospitalisations throughout Sweden. In this system, information is coded identifying both external causes of injuries (bicycles, for example) and outcomes of injuries (head injuries, for example). Sweden switched from the ninth revision of ICD (ICD-9, 1987) to the tenth revision (ICD-10, 1999). Cases for this study over the earlier periods were defined using ICD 9 codes E819G and E826 (bicycle related injuries), and 900, 910, 920-921, 925, 850-854, 870-873, 800-804, 830, 848A-B (head injuries) and 850 (concussion). Later cases for this study were identifying using ICD 10 codes V10.0-19.9 (bicycle injuries), head injuries, (S00.0-S09.9) and concussion (S06.0).

As head and brain injuries, including fracture and concussion, have been associated with long term disabilities, the study compares these injuries, labelled ‘head injuries’ against injuries to all other body areas, labelled ‘all other’. The study uses four age groups, as some policies were directed primarily at children under 15 over the study period. Age groups used in this study’s analyses included 0-14; 15-24; 25-64; and 65+.

This study assesses changes in trend direction for age- and injury-category specific rates per 10 000 population. While standardized rates are useful in comparing populations against each other, and for smoothing out differences in age categories in a single population over time, analyses of actual age and injury-category rates are also useful, as these analyses provide specific, and realistic information.
about a population, before, and over the course of implementation of a national campaign to reduce road traffic deaths and injuries. As the researchers involved in this study were very familiar with the policies and educational methods used to promote bicycle helmet use in the study population over the study period, it was determined that use of Joinpoint analyses using crude rates, assessing changes in injury risks in real life populations, would be most accurate.

Data sources
This study is population-based, using data from registries maintained by national authorities in Sweden. Records of hospitalisations due to bicycle-related injuries were compiled by request from Sweden’s Patient Register (National Board of Health and Welfare, 2013b). This register contains information on injuries occurring within Sweden, whether or not the injured person resided in the country at the time of injury. These data sources are considered highly reliable. The Patient Register is reliable, with the proportion of missing hospitalisation cases (non-registered injuries) estimated to be 1%. When an injury or poisoning diagnosis is reported a more detailed diagnosis is mandatory. The total number of records missing such information in 2006 was 3.1% (National Board of Health and Welfare, 2013b). Age- and injury-category specific rates were calculated using population data from Statistics Sweden as denominators (Statistics Sweden, 2014).

Methods
Age-and-injury category specific hospitalisation rates for the study years for the different study populations were analysed using the Joinpoint Regression program (2014). This program, originally developed for use in cancer research, has been increasingly featured in studies for other health issues, including the relationship of mortality rates to income level (Kondo et al., 2014); the incidence of infectious diseases (Torre et al., 2011); and occupational illness and injury trends (Friedman and Forst, 2007). The program is useful for assessing changes in directions of trends, in comparison to other regression line models which fit a single line to data. Joinpoint trend analyses can allow for multiple elbows, or connected lines, showing statistically significant changes in trend direction, depending on the number of data points (Kim et al., 2001). In this study, the grid search method was used to determine the best fit for models of each study group, with the program limited to no more than 4 Joinpoints. The model used log transformation to detect APCs and related confidence intervals in age group and injury category-specific hospitalisation rates per 10 000 population in Sweden 1987-2011. Significance for this study was set at .05.
RESULTS

**Total hospitalisations**

The total number of hospitalisations included in this study was 98,540 (See Table 1.) The total hospitalisation rate per 10,000 population for all age groups and injury types has remained fairly steady over time, ranging between 3.5 and 4.5. (See Table 2.) Age group and injury category-specific hospitalisation rates per 10,000 population are shown in Figures 1a and 1b. Hospitalisation rates per 10,000 population have decreased for patients with head injuries in all age groups, with children under 15 showing the largest decrease over time. Age groups 0-14 and 65+ experienced moderate decreases in hospitalisation rates per 10,000 for bicycle-related injuries to other body areas, while rates for age groups 15-24 and 25-64 showed less change over the study period.

![Figure 1a: Injury-category specific hospitalisation rates per 10,000 population, bicycle related head injuries by age group, Sweden, 1987-2011.](image-url)
Figure 1b: Injury-category specific hospitalisation rates per 10 000 population, bicycle related injuries to body parts other than head, by age group, Sweden, 1987-2011.
### Table 1: Total hospitalisations for bicycle-related injuries in Sweden, 1987-2011;

### Table 2: Unadjusted bicycle-related hospitalisation rates per 10,000 population, all ages and injury categories, Sweden, 1987-2011.

<table>
<thead>
<tr>
<th>Year</th>
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<th>Other body parts</th>
<th>Year</th>
<th>Rates</th>
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<td>15-24</td>
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<td>1002</td>
<td>365</td>
<td>715</td>
<td>249</td>
</tr>
<tr>
<td>1990</td>
<td>915</td>
<td>360</td>
<td>781</td>
<td>264</td>
</tr>
<tr>
<td>1991</td>
<td>821</td>
<td>357</td>
<td>715</td>
<td>244</td>
</tr>
<tr>
<td>1992</td>
<td>801</td>
<td>372</td>
<td>827</td>
<td>268</td>
</tr>
<tr>
<td>1993</td>
<td>754</td>
<td>326</td>
<td>870</td>
<td>277</td>
</tr>
<tr>
<td>1994</td>
<td>756</td>
<td>393</td>
<td>979</td>
<td>215</td>
</tr>
<tr>
<td>1995</td>
<td>740</td>
<td>402</td>
<td>917</td>
<td>214</td>
</tr>
<tr>
<td>1996</td>
<td>733</td>
<td>348</td>
<td>853</td>
<td>216</td>
</tr>
<tr>
<td>1997</td>
<td>541</td>
<td>325</td>
<td>772</td>
<td>216</td>
</tr>
<tr>
<td>1998</td>
<td>528</td>
<td>284</td>
<td>667</td>
<td>193</td>
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<tr>
<td>1999</td>
<td>614</td>
<td>297</td>
<td>819</td>
<td>216</td>
</tr>
<tr>
<td>2000</td>
<td>555</td>
<td>257</td>
<td>779</td>
<td>188</td>
</tr>
<tr>
<td>2001</td>
<td>489</td>
<td>246</td>
<td>693</td>
<td>217</td>
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<td>2002</td>
<td>568</td>
<td>245</td>
<td>674</td>
<td>213</td>
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<tr>
<td>2003</td>
<td>555</td>
<td>224</td>
<td>715</td>
<td>163</td>
</tr>
<tr>
<td>2004</td>
<td>489</td>
<td>255</td>
<td>692</td>
<td>180</td>
</tr>
<tr>
<td>2005</td>
<td>504</td>
<td>240</td>
<td>711</td>
<td>205</td>
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<tr>
<td>2006</td>
<td>444</td>
<td>208</td>
<td>592</td>
<td>191</td>
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<tr>
<td>2007</td>
<td>444</td>
<td>191</td>
<td>538</td>
<td>169</td>
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<tr>
<td>2008</td>
<td>450</td>
<td>186</td>
<td>568</td>
<td>156</td>
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<tr>
<td>2009</td>
<td>396</td>
<td>182</td>
<td>508</td>
<td>150</td>
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<tr>
<td>2010</td>
<td>320</td>
<td>133</td>
<td>463</td>
<td>155</td>
</tr>
<tr>
<td>2011</td>
<td>374</td>
<td>152</td>
<td>493</td>
<td>172</td>
</tr>
</tbody>
</table>

Table 3: Summary of annual percent changes of age- and injury-category specific hospitalisation rates per 10 000 due to bicycle injuries, Sweden, 1987-2011.

<table>
<thead>
<tr>
<th>Age and injury category group</th>
<th>Period</th>
<th>Estimated average APC</th>
<th>Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14 Head</td>
<td>1987-1997</td>
<td>-6.4*</td>
<td>-8.2</td>
</tr>
<tr>
<td></td>
<td>1997-2011</td>
<td>-3.0*</td>
<td>-4.1</td>
</tr>
<tr>
<td>0-14 Other Body Part</td>
<td>1987-2011</td>
<td>0.0</td>
<td>-0.6</td>
</tr>
<tr>
<td>15-24 Head</td>
<td>1987-1995</td>
<td>3.8*</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>1995-2011</td>
<td>-6.5*</td>
<td>-7.4</td>
</tr>
<tr>
<td>15-24 Other Body Part</td>
<td>1987-2011</td>
<td>-0.8*</td>
<td>-1.4</td>
</tr>
<tr>
<td>25-64 Head</td>
<td>1987-1994</td>
<td>4.6*</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>1994-2011</td>
<td>-4.1*</td>
<td>-4.8</td>
</tr>
<tr>
<td>25-64 Other Body Part</td>
<td>1987-1994</td>
<td>4.5*</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>1997-2011</td>
<td>2.1*</td>
<td>1.4</td>
</tr>
<tr>
<td>65+ Head</td>
<td>1987-1989</td>
<td>18.4</td>
<td>-9.1</td>
</tr>
<tr>
<td></td>
<td>1989-2011</td>
<td>-2.9*</td>
<td>-3.5</td>
</tr>
<tr>
<td>65+ Other Body Part</td>
<td>1987-1993</td>
<td>3.2</td>
<td>-0.4</td>
</tr>
<tr>
<td></td>
<td>1993-1998</td>
<td>-7.2*</td>
<td>-13.2</td>
</tr>
<tr>
<td></td>
<td>1998-2011</td>
<td>1.0</td>
<td>-0.1</td>
</tr>
</tbody>
</table>

*the Annual Percent Change (APC) is significantly different from zero at alpha=.05
(Source data: National Board of Health and Welfare, 2013)

CHILDREN AGES 0-14

Head injuries
The APC for head-related hospitalisation rates per 10 000 population for this age group showed significant decreases from 1987 to 1997. For the later part of the study period, 1997-2011, these decreases continued to be significant, albeit at a more reduced rate of change.

Injuries to other body areas
No significant changes in APCs for hospitalisation rates per 10 000 population are seen for this age- and injury-category group over the study period.

TEENAGERS AND YOUNG ADULTS AGES 15-24

Head injuries
A significant increase in APC is seen in hospitalisation rates per 10 000 for this age- and injury-category group for the period 1987-1995. From 1995 onwards, the APC shows significant decreases.
Injuries to other body areas

A small, but significant decrease in APC is seen for hospitalisation rates per 10 000 for this age- and injury-category group over the entire study period.

Table 4: Age-specific rates per 10 000 population, hospitalisations due to injuries occurring on motorcycle or in automobile, age group 15-24, Sweden, 2001-2011.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total hosp motorcycle and auto</th>
<th>Population</th>
<th>Age group specific rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>2170</td>
<td>1034694</td>
<td>21.0</td>
</tr>
<tr>
<td>2002</td>
<td>2196</td>
<td>1049230</td>
<td>20.9</td>
</tr>
<tr>
<td>2003</td>
<td>2437</td>
<td>1073317</td>
<td>22.7</td>
</tr>
<tr>
<td>2004</td>
<td>2482</td>
<td>1097009</td>
<td>22.6</td>
</tr>
<tr>
<td>2005</td>
<td>2512</td>
<td>1125648</td>
<td>22.3</td>
</tr>
<tr>
<td>2006</td>
<td>2305</td>
<td>1161299</td>
<td>19.8</td>
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<tr>
<td>2007</td>
<td>2390</td>
<td>1194554</td>
<td>20.0</td>
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<td>2008</td>
<td>2155</td>
<td>1221743</td>
<td>17.6</td>
</tr>
<tr>
<td>2009</td>
<td>2051</td>
<td>1243986</td>
<td>16.5</td>
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<tr>
<td>2010</td>
<td>1634</td>
<td>1250621</td>
<td>13.1</td>
</tr>
<tr>
<td>2011</td>
<td>1594</td>
<td>1243238</td>
<td>12.8</td>
</tr>
</tbody>
</table>

Data source: National Board of Health and Welfare, 2014

ADULTS AGES 25-64

Head injuries

APCs for hospitalisation rates per 10 000 for this age- and injury-category group increases significantly from 1987 to 1994 then decreased significantly, by about the same magnitude, over the remaining years of the study period.

Injuries to other body areas

Significant changes in APCs for hospitalisation rates per 10 000 for this age- and injury-category group occurred twice in the study period, with increases seen from 1987 to 1984, then a decrease from 1984-1997, and another increase, from 1997 through 2011.

OLDER ADULTS AGES 65 AND OLDER

Head injuries

A significant decrease in APCs for hospitalisation rates per 10 000 for this age- and injury-category group occurred from 1989 through the end of the study period.
Other body areas
Changes in APCs for hospitalisation rates per 10 000 for this age- and injury-category group occurred three times over the study period. However, only the change in APC for the period 1993-1998 was considered significant. There has been no significant change in APC from 1998 through the end of the study period.

Summary of changes in APCs of hospitalisation rates per 10 000 for bicycle-related head injuries
The APCs for hospitalisation rates for bicycle-related head injuries for all age groups has decreased over the study period. For the youngest age group, decreases have occurred throughout the study period- only the rate in which the decreases occur has changed, with a diminishment in magnitude of decrease occurring in 1997. Decreases for age groups 15-24 and 25-64 occurred between 1994 and 1995, and continued to decrease from this period on. For the age- and injury-category group 65+, the decreases in hospitalisations have remained stable since 1988. Important periods for changes in APCs for three of the age- and injury-category groups occur between 1994 and 1997.

Summary of changes in APCs of hospitalisation rates per 10 000 for bicycle-related injuries to other body areas
The APC for hospitalisation rates per 10 000 population for bicycle-related injuries to body areas other than head have shown no significant changes in direction for the youngest age group in this injury category. APCs for similar rates show modest, but significant decreases for the next oldest group, 15-24. APCs for hospitalisations per 10 000 population for bicycle-related injuries to body areas other than head have increased significantly for the age group 25-64 from 1997 through 2011, and for the age group 65+, nonsignificant increases are seen from 1998 onwards. Thus, for the largest percentage of the Swedish population, in the working years from 25 through 64, there have either been no significant changes, or increases in, APCs of hospitalisation rates per 10 000 for bicycle-related injuries to other body areas from 1998 onwards.

DISCUSSION

Limitations
This study has limitations. First, exposure information is missing. No reliable data is currently available that provides information on bicycle use patterns by different age groups at the national level. In addition, the study focuses on analysing changes in APCs of age-and injury-category specific hospitalisation rates, rather than age-standardized rates. This means that while the data describes actual hospitalisation rates during a period when Sweden was changing its traffic environments, the data in this study cannot be easily compared to other
populations. Secondly, Sweden switched from ICD 8 to ICD 9 over the first year of the study, and then, in 1997, began using ICD 10. These changes may have resulted in coding errors. Thirdly, use of hospitalisations of 24 hours or more as the measure of injury severity means that bicycle-related injuries that were treated in Acute Departments or outpatient clinics, or which resulted in hospital releases within 23 hours, are not included in this study. It was likely that some of the cases that were treated and released in some hospitals, were similar in injury severity, to cases where patients were admitted in other hospitals. In addition, patient data does not capture any information related to helmet use. Finally, the methodology used in Joinpoint regression analyses is aimed at identifying statistically significant changes in direction for annual percent changes. Thus, most of the findings reported using this method will be statistically significant. Caution should be used in interpreting and ranking the relative importance of changes in this and other studies using this method. Note as well that the selection of study years will impact Joinpoint analyses.

Age-and-injury category specific rates for hospitalisations
More than 98 000 bicycle-related hospitalisations occurred over the study period. Overall, hospitalisation rates per 10 000 population for most age- and injury category groups have remained fairly steady over the study period. In contrast to studies from other countries, where hospitalisations for head injuries far out-number hospitalisations for injuries to other body areas, the proportion of hospitalisations for injuries to other body areas compared to head injuries is quite high in Sweden.

What the analyses can tell us about decreases in APCs of hospitalisation rates due to bicycle-related head injuries
Steady decreases in APCs related to hospitalisation rates per 10 000 population for bicycle-related head injuries are seen for all age groups in this study. One factor that could have possibly contributed to overall decreases in age- and injury-category specific rates for bicycle-related hospitalisations for all age groups for head injuries is changes in how Swedish health care diagnosed and treated head injuries. Some suspected cases of concussion and other head injuries may now be more likely to be treated with outpatient care, due to limited beds, as the total number of hospital beds has decreased by about 50% over the study period (Sveriges kommuner och landsting, 2004). An argument could be made that the decreases in hospitalisation rates for head injuries in bicyclists could also be associated with better diagnostic tools, including increased use of computerized tomography (CT) scans to rule out concussion. However, analyses of differences in hospitalisations for patients diagnosed with concussion and other head
injuries over the study period indicates that the total number of hospitalizations due to head injuries, excluding concussion, has increased for every age group. These increases in non-concussion head injuries are particularly noticeable for children under 15 and older people, ages 65 and older. Yet, the total number of hospitalisations for concussions has decreased somewhat for all age groups, and is especially noted for children under 15. There are substantial differences in these hospitalisation decreases, when viewed by age group and all external cause of injuries, with the largest reduction seen in children who experienced head injuries while riding bicycles. This indicates that specific protective factors are associated with better outcomes for this group.

This study further notes that the Nordic Radiation Safety Authorities (2013), which provide oversight for Sweden, Norway, Denmark, Finland and Iceland, have stated that between 20-75% of all diagnostic procedures in these countries are not necessary, as they have not provided evidence of injury. This indicates that CT scans have had less impact on reducing the diagnoses of concussion, as increases in use are not associated with reductions in ‘false diagnoses’. The evidence related to diagnoses and treatment of head injuries indicates that the gains seen in this study for decreased in APCs related to head and concussion injuries are therefore real, to some extent, and not solely based on changes in medical care.

The largest relative decrease in APCs for head injuries for children was seen during the earliest years of this study period 1987-1997, where helmet use was not routinely enforced for this age group. Working age adults, 25-64, and older adults, 65+, also show significant decreases in APCs associate with hospitalisations rates per 10 000 population for bicycle-related head injuries, from 1994 on, and from 1989 on, respectively. This is also a period well before Vision Zero began to implement changes in the traffic environment. It coincides, however, with a period when helmet use was increasingly promoted in Sweden. In 1986, consumer guides were available that described the shock-absorbing and impact-distributing properties of bicycle helmets, and a year later, the first product guidelines for bicycle helmet were issued by the Swedish Board for Consumer Policies. A national conference on bicycle helmet use was held, with resultant media attention, in 1995, with several hundred people attending. A follow conference in 1997 attracted attendees from other Nordic countries. In order to promote bicycle safety, a Swedish Bicycle Helmet Initiative Group was established in 1991 within WHO’s Global Program on Accident and Injury Prevention. The program was coordinated by Karolinska Institutet in Stockholm. A WHO Secretariat on bicycle safety was also established for a time (Svanström et al., 2002). A series of observational studies on helmet use, shown in Figure 3, shows that use increased steadily over time for all age groups (Nolén et al., 2005). In 2011, an observation-
al study of 57,220 bicyclists in locations throughout Sweden showed that helmet use in children ages 10 and under who were bicycling in residential areas was about 69%. The study found that helmet use decreased with age—about 45.5% of the bicyclists in the early teens (13-15 years) wore helmets, while only 24% of adults bicycling to and from work were observed wearing helmets (Larsson J & VTI, 2012).

One of the most unexpected findings from this study is the decrease in APCs for head injuries for age group 15-24, beginning in 1995. This age group, which is traditionally associated with higher traffic injury risks compared to older adult groups, is not required to wear helmets while biking. Was the decrease in APCS related to hospitalisation rates for bicycle-related injuries due to exposure, that is, were people in this age group switching over to other transportation? If that was the case, then hospitalisations for non-bicycle-related traffic injuries should have increased, if there was something inherently ‘risky’ about this age group in terms of their ability to manage general traffic safety behaviours. To assess if changes in vehicle use could impact head injuries due to bicycle-related events in this age group, hospitalisations for the three most common traffic-related injuries were
reviewed. (See Table 4.) Decreases in age-specific injury rates were seen for all three transportation modes. Does this mean that risk-taking behaviour in traffic environments is slowly changing in this age group?

The contributions of the earlier part of this study period, in terms of achieving significant decreases in APCs for hospitalisation rates per 10 000 population for bicycle-related head injuries, is important for researchers to investigate, particularly as attention shifts to the impact of Vision Zero on road traffic safety. Given the findings of this study, it appears that this campaign was implemented in a society where injury rates for bicycle-related head injuries were already decreasing. While this finding in no way diminishes the tremendous impact of Vision Zero, it does cause a bit of concern as to the generalizability of similar campaigns in other settings.

Other body areas
The APCs for hospitalisation rates per 10 000 population for all but one age group in this injury category have either remained the same, or increased over the study period. Total (aggregate) numbers of hospitalisations due to bicycle-related injuries to body areas other than head or concussion outnumbered hospitalisations due to bicycle-related injuries to head for all age categories by the last few years of the study period. Thus, prevention of serious injuries to body parts other than head could result in important, and significant, changes in overall bicycle-related injury rates.

Unfortunately, information regarding injury circumstances is not routinely collected by the Patient Register. It is difficult to identify risk factors associated with these hospitalisations. To better understand bicycle-related injuries to body areas other than head, information from National Board of Health and Welfare’s Injury Data Base (IDB) (2013c) can be consulted. This data base, which is a component of a larger European Injury Data Base, provides more detailed injury records. Hospital-based emergency rooms covering about 7% of Sweden’s population provide information to this data base. Results from IDB are extrapolated out to the general population. IDB records allow for free-text recording of the underlying circumstances related to injuries treated in hospital emergency rooms and acute care clinics.

The IDB data for outpatient treatment of bicycle injuries from 2009-2010 showed that males and females showed similar injury patterns. Upper and lower extremities comprised more than half of all body parts injured. The most common types of injuries included contusions (30%) and fractures (about 24%). Concussions accounted for about 5% of all bicycle-related injuries treated in hospital emergency rooms and acute care clinics. Of special interest was the finding that more than 80% of all these injuries involved single-bicycle events.
The five leading causes contributing to bicycle-related injuries were slippery road surfaces (18%), problems navigating between sidewalks and other surfaces (13%), entanglement of hands, feet or other objects in bicycle wheels (9%), mounting or dismounting from bicycles (8%), and cycling on gravel and sand (7.5%). Alcohol was involved as a factor in 6% of all recorded events.

If the factors that are associated with outpatient-treated bicycle-related injuries that are captured by IDB are also factors that are related to more severe injuries, then more emphasis should be placed on maintaining better road and trail surfaces for bicyclists. Slippery surfaces and navigating problems lead the list of contributing causes to milder types of bicycle-related injuries to body areas other than head. Single-bicycle injury events can also be due in part to operator error, that is, bicyclists who over-estimate their ability to manoeuvre in less-than-optimal circumstances. Fractures can occur both from falls off the bicycle, and falls while mounting and dismounting. For these types of injuries, modifications to bicycles, and to where and how bicyclists mount and dismount, should be studied.

The usefulness of Joinpoint regression methods in injury-prevention studies

The use of Joinpoint regressions in injury prevention studies is fairly new—indeed, the methodology itself was first published in 2000. Changes in Joinpoint directions are not necessarily directly related to actual increases or decreases in aggregate numbers or rates, that is, the numbers do not refer directly to victims of injuries per se. Rather, Joinpoint changes show when changes in direction and-or magnitude of trend occur.

The ability of the analytical methods to pinpoint periods where changes occurred, can be helpful for ongoing evaluation of road safety campaigns, and identification of other high risk traffic groups, including motorcyclists and pedestrians. Information about these ‘change periods’ from this study can serve as a baseline for ongoing process and outcome evaluations for the effectiveness of road safety work in Sweden. As more information is gathered on the relationship between the effects over time of various traffic safety measures against changes in APCs, more effective injury prevention campaigns can be developed.

SUMMARY

This study adds to what is known about bicycle-related injury patterns in Sweden, by identifying specific temporal periods in which significant changes in directions occurred for hospitalisation rate trends for both head injuries, and injuries to other body areas, of bicyclists in Sweden over a 25-year period. While the strongest decrease in APCs related to hospitalisation rates occurred during the
first part of the study period for head injuries to children under 15, APCs related to other hospitalisation rates for head injuries show decreases, as well. However, the APCs related to hospitalisations due to injuries to body areas other than head and concussion have either shown no significant decrease, or have increased, for the largest age groups, adults ages 25 and older.

ACKNOWLEDGEMENTS
We wish to thank Anders Jonsson, Swedish Civil Contingencies Agency, for support in statistical analyses; and, Pernilla Fagerström and Tomas Wänskä, National Board of Health and Welfare, for delivery of requested databases.

REFERENCES


A BRIEF HISTORICAL REVIEW
Consumer safety when it comes to not being harmed physically by different products is important and has always been a component of Swedish consumer politics. Supported by among other things, the Product Safety Act and the Marketing Act, the Swedish Consumer Agency is one of the supervisory authorities tasked with monitoring that unsafe consumer products are not being offered for sale. The development of different new products means at best better, healthier and more enjoyable products, but at the same time risks also emerge. In the area of product safety - covering both goods and services - the Swedish Consumer Agency sees significant deficiencies, and consequently a major need for research that covers injury registration, risk analysis, strategies for loss prevention measures and related methods and theories.

More than 30 years ago, in the 1980s, the Swedish Consumer Agency and other stakeholders highlighted the need for greater collaboration between government agencies, universities and other research institutions, with the goal to prevent home and recreational accidents. In similarity to the research of injury risks within work and traffic, and the prevention measures that this research has generated, targeted and conscious efforts can be made to reduce the number of accidental injuries for consumers in home and leisure environments.

1980 – 1995
In the 1980s, the Swedish Consumer Agency published a report entitled, “Improve Safety”1 where the accident scenario for consumers was studied through extensive interviews in hospital clinics conducted in collaboration with the Red Cross. Those interviewed at accident and emergency departments were people injured by consumer products. Injury registration was introduced at some hospitals at this time, but there was no information that could be related to the whole country.

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1 “Öka Säkerheten” Swedish Consumer Agency report KOV 86/87:11
Comparisons with the much more extensive knowledge base on injuries in the world of work and on the roads along with the decreasing accident frequency in these areas showed great potential in reducing the injuries caused by consumer products if a similar working methodology could be applied and if, for example, knowledge of the injury scenarios could be improved. The “Improve safety” study showed a major need for injury registration and risk analysis on a national basis that is also needed to neutralise home and recreational accidents in the most systematic and expedient manner possible.

The Swedish Consumer Agency was a driving force in developing requirement specifications along with several international standardisation groups as a way of interacting with industry representatives and other stakeholders in issues such as safe toys, prams, various types of personal protective equipment etc. The agency also began to campaign for the increased use of ice hockey, bike, equestrian and ski helmets with positive results. This increased use resulted in fewer deaths and less severe injuries. The wearing of life jackets directly resulted in fewer drownings. An example is when approved life jackets were introduced which halved the number of drowning accidents while the number of boats in the same period increased tenfold. Everything revealed the need for continuous research to study the injuries in order to provide supporting documentation for the requirements to be placed on the equipment and its use.

1995 – 2005

The Consumer Research Board published its report “Research for our everyday lives” in 1996. The Swedish Council for Planning and Co-ordination of Research (Forskningsrådssämnaden - FRN) was commissioned to prepare a coordinated programme to build up long-term research expertise in consumer research. “Safety” is listed as a priority research field. In this connection, the Swedish Consumer Agency was commissioned by the government to develop a research programme for consumer safety issues for the years 1998 – 2000. The programme was developed in consultation with the Public Health Institute (Folkhälsoinstitutet) and the National Board of Health and Welfare (Socialstyrelsen) and was presented in the report “Research on consumer safety”. The proposed split of the content of such a programme is:

- Epidemiology – Injury statistics
- Strategies for injury prevention
- Methods and theory
- Implementation of R&D results

3 “Forskning om konsumentssäkerhet” KOV 1998-10
One of the proposals to facilitate university-related activities getting started was to allocate funds for setting up a Centre for Consumer Safety Research. The corresponding needs for creating a centre had been proposed in the inquiry into the School of Public Health carried out on behalf of the President at Karolinska Institutet. A good example was in Holland.

In 1998 a workshop was held under the auspices of the Swedish Council for Planning and Co-ordination of Research, (Forskningsrådsnämnden - FRN) where the various seminars were gathered in a report entitled “Consumer safety and injury analysis”4. This section outlines some of the forewords to the report:

The reason for the focus on research into product safety is that there is a major lack of knowledge on product-related injuries in the home and in the area of recreation. This lack of knowledge represents a barrier to effective injury prevention in the field of consumer safety. A comparison with other sector areas such as Occupational Health & Safety and Traffic Safety shows major advances in safety initiatives in terms of the systematic acquisition of knowledge. To promote the creation of product safety research in Sweden, the working group has proposed that FRN should invest in building networks, study the current knowledge status and identify research needs in the field of consumer safety and product related injuries. These activities have been jointly funded by the FRN and the Swedish Consumer Agency.

During the conference it was revealed that few researchers are working in the field. At the same time, there is significant interest from researchers and a potential for the development of this research. However, from a long-term future perspective, funding is among the things needed to recruit new researchers to a university and college-related consumer safety research programme. To get the data needed to identify the problems and for prioritising the research areas, injury registration in the home and recreation area is a natural and necessary beginning. Swedish injury registration needs to be expanded to enable it to offer for research nationally representative data with reliable information on, among other things, the products involved. There is currently no long-term funding available for these purposes.

The FRN and the Swedish Consumer Agency see this workshop as an initial step towards the development of the above-mentioned area and would like to thank the researchers involved for their contributions. A special thanks to Docent Ragnar Andersson who has had primary responsibility for the organising of workshops, the building of research networks and the

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4 "Konsumentsäkerhet och skadeanalys" FRN Rapport 99:8
knowledge review. It is the hope of FRN that this report will help to accelerate the development of research in this key area.

Arne Jernelöv, Chief Secretary, FRN
Gunilla Jarlbo, Chair, FRN Committee on Consumer Research
Vera Novakova, Research Secretary, FRN
Bertil Elenius, Department Manager, Swedish Consumer Agency
Lotten Strindberg, Department Director, Swedish Consumer Agency

The editor of the report was the then Docent Ragnar Andersson, who also wrote the introductory section, “Consumer safety as a concept, strategy and area of research” along with Lotten Strindberg at the Swedish Consumer Agency. Ragnar Andersson also wrote the section on “Consumer safety in an international context”, and together with Professor Leif Svanström the final section “Summary of future needs”. The section ends with the following paragraph:

“In conclusion, it is of the utmost importance that safety problems in the home and recreation area, which quantitatively are responsible for more injuries than traffic and the world of work put together, are henceforth attacked, even scientifically, through a broad and long-term programme of research. In this context, it is proposed that the consumer safety concept would be an important and common frame of reference.”

In January 1999, the Government appointed a parliamentary committee, “Consumers Committee 2000”, which was tasked to make proposals for how future consumer policy could provide people with opportunities to feel confident as consumers and have a strong influence over their everyday situation. The Committee noted that “the current research is not consistent in our view, with the needs of society in terms of breadth and scope” and proposed, among other things, that:

- Consumer science as a collective term for consumer research should be established as an academic discipline at universities and colleges
- A National Centre for Consumer Science at a University/college level should be established to raise the status of the field and give it its own identity in the world of research.
- Under the title product safety it was stressed that long-term funding should be ensured for an injury register of home and recreational accidents.
2005 – 2010
“Research for a safer society” was the name of the Swedish Civil Contingencies Agency’s (Räddningsverket) orientation document for safety research. It consists of a long-term strategy and a research programme covering the years 2007 to 2010. The Swedish Consumer Agency stresses in its official comment on the programme that:

...The Swedish Consumer Agency shares the Swedish Civil Contingencies Agency’s view on the need for further research in terms of clarifying questions about risk perception for individuals, groups and society at large, particularly those related to issues concerning everyday risks.

In the report “Safe recreation – a research review” from the Swedish Civil Contingencies Agency (MSB), safety research in recreational activities has been carefully studied and it is clear that more research is needed to identify risk factors associated with recreational activities.

The relocation of the Swedish Consumer Agency to Karlstad in 2007 generated the natural conditions to extend its cooperation with the Swedish Civil Contingencies Agency (MSB) and to also strengthen its cooperation with Karlstad University, and especially with the Department of Public Health Sciences where Ragnar Andersson has been a professor for many years.

2010 –
Because there was already a high level of competence at Karlstad University, the Swedish Consumer Agency was a major catalyst for establishing a national centre for personal safety here. There is a major need of scientific evidence to support preventive efforts at several agencies, county councils and municipalities. Between 2011 and 2013, the Centre for Public Safety (CPS) was formed and established at Karlstad University with Professor Ragnar Andersson as its superintendent. CPS is unique in its cross-sectional nature.

The Swedish Consumer Agency tasked this centre of excellence in 2012 to update and expand a study of how government investment in prevention activities and research on accidents should be allocated between the sectors 1) transportation, 2) home and recreation and 3) work and school. The findings of the study include that:

- there is an important and seemingly unreflective imbalance between the problem scenario and government priorities in the area of accidents between

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5 “Säker fritid – en forskningsöversikt” NCO 2008:8
the sectors, which means that relatively little is being invested in injury prevention in the home and recreational area

- major initiatives are required to improve safety within the home and recreational area and strong reasons to suggest that the consumer sector takes the initiative in such a process of change

The authors with CPS superintendent Ragnar Andersson at the fore ask the question in their concluding analysis: “What can we do to expand the initiatives in the home and recreational area? - Policy-wise, it can be difficult to achieve rapid changes in terms of agency work and the like. A good start could therefore be to try to create a strong, integrated research environment, which could pave the way for improved knowledge and a general increase in highlighting the risks in the home and recreational area. This should be possible through an integrated initiative from academia and the relevant authorities along with the support of the already available funds from any of the major research funders.” Once again, the importance of a close cooperation between the agencies is stressed such as the Swedish Consumer Agency and the world of research in order to develop the work on increasing consumer safety.

THE SWEDISH CONSUMER AGENCY AND RISK MANAGEMENT
In the area of product safety, the Agency has an important role to play as a market regulatory authority supported by, among other things, the Product Safety Act and the Marketing Act. Each market intervention initiative and prevention effort involves a risk evaluation and the agency naturally needs tools for this analysis. At the same time, the development of various new consumer products involves the expansion of new areas of risk and risk products. Therefore, support from various research areas, which include injury registration, risk analysis, strategies for injury prevention, etc. are extremely important to the Swedish Consumer Agency in order to act to increase the safety of consumers.

National prevention work in the traffic sector has yielded results. Each year about 1,200 people died in traffic in the late 1960s. Today that figure is down to 300 despite the number of cars on the road having doubled. There are good examples of effective preventive measures even in the home and recreational area, but they have been on a much more modest scale, as a result of the priorities of the state.
FINAL REMARKS
The things that can be done to eliminate the risk of accidents, accident pre-
vention in the home and during recreational activities are important issues that
we need to learn more about. Improved knowledge on risk management and
injury prevention measures are a necessary foundation for the Agency’s work
on product safety. I see this as one of the future key consumer issues. One area
where the Centre for Public Safety at Karlstad University will form a necessary
and inspiring knowledge hub!

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The bomb attack in Oslo and the shootings at Utøya, Norway, 2011

Experiences of communication and media management

Liselotte Englund

Communities and authorities need to be well prepared for communication and media management in the presence of current, emerging or evolving risks. The conception of risk usually overlaps with definitions on crises and disasters. Risk communication is often used broadly to capture both risk and crisis communication. Crisis communication, often conflated with risk communication, is a separate field, but can include aspects of risk communication (Sheppard et al, 2012).

Historically, risk communication research tends to most frequently involve case studies and lists of best practices. Among earlier case studies are the September 11th terrorist attacks (Carey, 2003, in Noll) and Hurricane Katrina (Sheppard et al, 2012). Risk communication studies have a tradition of focusing on information presentation, persuasion, and strategic messaging. Additionally, failures at controlling or managing risk effectively can lead to a crisis, or a crisis may lead to the necessity for risk communication (Coombs, 2010).

Critical event phases - at disasters, terror attacks or major accidents - are often defined by the following distinctions:

- **Preparedness**: pre-event risk communication outlining practical preparedness measures, including education on likely risk characteristics of various threats
- **Response (Imminent Warnings)**: crisis communication and guidance regarding protective actions to take immediately prior to, in the midst of, or during the hours immediately following an event;
- **Recovery**: messages communicating needs and guidance in the weeks, months, and years following an event. (Sheppard et al, 2012).
Acts of terror often entail major challenges for healthcare services. Not just the medical support, but also the authorities’ crisis communication and media management is under pressure. The following text will summarize experiences by the results of an observatory study on the bomb attack in Oslo and the shootings at Utøya, Norway, 2011. The report focuses on the communication and media management during the response phase of the bombings and shootings. The main focus is on how the medical and health care services managed during the first hours and the followings days after the events.

The preconditions for the work presented (Englund et al, 2012, KAMEDO 97) are that the Swedish National Board of Health and Welfare was requested to provide support to the commission that was established in Norway to evaluate the Norwegian society’s handling of the incidents of the 22 July, the “22 July Commission” (NOU 2012:14). The KAMEDO observer reports study the medical, psychological, organizational and social aspects of disasters. In the report from the 22 July Commission, crisis communication and media management got a more prominent position than in previous KAMEDO reports. One reason is that the Norway attacks seemed to generate more extensive media coverage – and not least social media activities – than what has been the case at earlier observed events.

The following text is part of the previous published report:
http://www.socialstyrelsen.se/publikationer2012/2012-12-23

The KAMEDO report in turn was part of the Norwegian Government report, as the National Board of Health and Welfare was requested to provide support to the commission that was established in Norway to evaluate the Norwegian society’s handling of the incidents of 22 July, the “22 July Commission”:

The text, which is based on parts (authored by Liselotte Englund) from the KAMEDO report, is published with permission from The National Board of Health and Welfare.
THE 22 JULY EVENTS
On a Friday afternoon, July 22, 2011, a homemade bomb planted in a car exploded and ripped through the central area of Norway’s capital, Oslo. Windows were blown out in the government district, killing 8 people, and wounding dozens more.

In total, 77 people were killed on the 22 July 2011, eight as a result of the bomb explosion in the government district and the rest in the shootings at the island Utøya, where the Norwegian Labour Party’s youth organisation was holding its summer camp. At least 90 people are estimated to have been injured in the bomb attack. Those injured were evacuated from the island, either by land ambulance to the local hospitals – for example Ringerike in the municipality Hønefoss - or by helicopter to the University Hospital at Ullevål, Oslo.

The events of the 22 July involved major parts of Norwegian society. It required great efforts from the medical services and there was a major demand for psychosocial support. Furthermore, the events triggered enormous interest in the media to which the parties involved were forced to respond. Risk and crisis communication was important parts of the crisis management.

COMMUNICATING RISK AND TRAUMA
Information, communication and media relations are central activities during crisis situations. Evaluations after serious incidents often indicate certain deficiencies within these areas, at the same time as they emphasize the importance of both good communication and media relations. The readiness to meet the needs of the media for information is part of this communications preparedness, including providing journalists, photographers and others suitable working conditions. A WHO report concerning the tsunami disaster (2005) asserts that the media’s speed is often unrivalled, and that the journalists play an important role in the provision of information during both the acute phase and recovery phase. According to the authors, professional actors in the media and communications area play a crucial role. Particularly emphasized is the local media’s – especially the radio – importance for mediating information to those directly and indirectly affected. The WHO authors also consider that the media’s critical reporting often contributes to shedding light on weaknesses relating to organization and preparedness, and speed up the improvement work.

Previous KAMEDO reports (http://www.socialstyrelsen.se/kamedo ) have highlighted these areas to varying degrees – a few of them describe experiences of the media at the scene and other contain summaries of media reporting after a certain incident. The purpose of the section of the KAMEDO report about the 22 July events in Norway 2011 (Englund et al, 2012) - relating to communi-
cation and media relations - was to reproduce experiences and lessons from the medical care perspective. The evaluation besides studying the health care services also partly describes the police authority (in the capacity of being responsible for communication and media relations at the incident scene) and the municipalities involved (as municipal leaders for the municipal emergency services).

MATERIAL AND METHOD
The terror attacks that Norway suffered on the 22 July 2011 have been described as the worst atrocities the nation has experienced since the Second World War. Many of the experiences can be related to Swedish emergency preparedness, and lessons can be learnt from the Norwegian handling of the incidents (Eklund in Englund et al, 2012).

Work on the report started in October 2011 and the completed report was delivered to the 22 July Commission in mid April 2012.

The data was primarily gathered through qualitative interviews, during fall 2011. The interviews were stenographed during conversations, due to the limited amount of time making recording and transcribing the interviews difficult. Respondents were stationed within the healthcare, medical services, police, municipalities and the media. Main informants were communication officers, but also medical doctors and staff with other relevant functions in leading positions.

Various types of written material have been obtained. For example strategic communication plans and crisis communication plans. Some interview questions were based on the different parts/themes of the communication plans. The aim was to check how the staff followed the plans and how they evaluated their own achievements in terms of following the plan and/or improvising in the moment.

POTENTIAL RISKS
The Norwegian Directorate for Civil Protection and Emergency Planning (DSB) stated in a national vulnerability and emergency preparedness report for 2011, that there has never been any serious terror threat levelled at Norway. The report assesses the terror threat towards Norway as being low. (DSB, 2011). A risk analysis of a major terror attack in Oslo is presented in mentioned report. A fictive case where groups of terrorists carry out parallel attacks against several targets with both explosives and firearms, is mentioned as something that is considered to be a realistic “worst-case scenario”. According to DSB, a relatively unlikely scenario. (DSB 2010 & 2011) In conclusion, DSB points out that the risk analysis is highly uncertain with respect to both the probability and consequences of such an incident (DSB, 2011). Still, it happened (Eklund, in KAMEDO 97, p.26).
Like the Swedish crisis management system, the Norwegian one is ruled by three main principles:

1. responsibility - the normally responsible party is also responsible for it in the event of a crisis
2. proximity - crises shall be handled at the lowest possible geographic level
3. similarity - the crisis organisation shall be as similar as possible to the normal organization. (Ivarsson et al, 2011).

COMMUNICATION PLANS AND MEDIA PREPAREDNESS
Norwegian crisis communication is complex, due to the fact that there are many different parties and responsible authorities that work at different levels and which overlap with each other both geographically and operationally. In some cases there are comprehensive crisis communication plans and, in other cases, communication and media relations warrant just a couple of lines in the emergency preparedness plan. The work with communication and media relations is also characterised by whether an entire communications unit is available (as is the case at Ullevål Hospital – the University hospital of Oslo), whether it is a public relations officer in another town who is responsible (as is the case at Ringerike Hospital – a minor regional hospital closer to Utøya) or whether the municipality’s information unit is operationally responsible (which is the case in the City of Oslo for Oslo’s general emergency ward and in Hole Municipality for Ringerike’s general emergency ward). Sometimes the organisation is less clear where several parties cooperate within the same temporary constellations.

COMMUNICATIONS RESPONSIBILITIES AT HOSPITALS (ULLEVÅL AND RINGERIKE)
Oslo University Hospital Trust, which incorporates Ullevål Hospital, has an emergency communications plan of more than 60 pages that is continually updated. It is stored digitally and is printed out for all staff when required. The plan was revised three days before the attacks of the 22 July 2011 and includes organisational descriptions, check-lists, a description of the communication staff’s emergency room and much more. The plan contains a list of “standard statements that provide breathing-space” as well as a wealth of advice concerning contact with the media. The check lists concern various different aspects of communication, the characteristics of the crisis and communications advice for use before, during and after a crisis. There are also check-lists for other types of crisis incidents. Furthermore, there is internal and external contact information, including an overview of the various parties that foreseeably could be affected by the crisis incidents. The plan also contains a matrix that assigns tasks. This
describes 20 different functions over a wide spectrum of responsibility areas, everything from activation of the press centre, to supplying the staff with food and drink. One of the functions has the task of following media reporting, while another logs all of the information. Two people devote themselves entirely to the production and publication of news, both internally and externally.

In the event of major disasters, Oslo University Hospital and Ullevål Hospital have responsibility for the communications of the regional health trust’s eleven hospitals. This means that all other hospitals involved are to report their status to the University Hospital, which coordinates the communications work.

COMMUNICATIONS RESPONSIBILITIES AT THE INCIDENT SCENE
In the event of extraordinary incidents, the Oslo police (of interest here due to its role as incident scene manager) organises itself in accordance with a specific emergency preparedness model. Within the Police Commissioner’s unit, a number of “P functions” are created, where P5 is the information function that looks after both internal and external communication, as well as press information and media relations. The communication procedures mean that no one may make a statement to the media (either to an individual reporter or via a public press statement) without it first having been discussed by the P5 and the response leader. All P-unit functions are physically located at the Oslo police station and are superior to the entire regular police organisation. The police have a dedicated web platform containing all communication plans and function descriptions. There are also templates for press statements to be used in various types of situations and incidents, in both Norwegian and English.

COMMUNICATION MANAGEMENT AND ORGANISATION
The majority of those who awaited in communication and crisis preparedness in Oslo on the 22 July 2011 were first alerted via media and then later through the authority’s regular alarm system. A text message from a relative or a subscribed newsflash on the mobile phone was for many the first signal that they should ready themselves. This clearly demonstrates that the role of media cannot be underestimated in the alarm phase. There are always differing opinions regarding the form and content of the reports, but the speed from incident to alarm is often unsurpassed. A small number of people heard a bang or ambulance sirens and went to work out of pure instinct, or might have already been working when the emergency alarm arrived.

Oslo Municipality learned a number of lessons from the incident, among them that a special telephone emergency number should be established for media so that they do not block emergency lines that are intended for the citizens.
Personnel at Oslo University Hospital emphasise the conflict between the strict confidentiality of the medical profession and the police’s more open stance. There were moments when the medical carers considered that the police supplied little too much information about the victims.

MEDIA PREPAREDNESS AT INCIDENT SCENES AND HOSPITALS

When disasters occur during “inconvenient working hours”, which they often tend to do, all of the actors involved are put to an even harder test. The regular working day may be over, key persons are on holiday, substitutes are not familiar with procedures and the initial period from alarm to work effort is longer than usual. This was also the case on the 22 July. In Oslo Municipality, two hours passed before the communications staff had been gathered, and Oslo Police had gathered only four people after the first hour. Ullevål Hospital was the quickest to respond. After half an hour, an emergency communications staff of four members had been formed, with more being added later.

One of the challenges with communication faced by many authority actors – especially when the victims are children and youths – relates to the information flow via social media and mobile communication. This must be considered in parallel with the work of disseminating correct and factual information, both directly to citizens (for example, via websites) and through the media. Great source criticism and ethical problems emerged here, as well as a communication problem.

When a local incident quickly becomes a national emergency, it might also be suitable that a national communication organisation comes into effect. One viewpoint that became evident regarding the communications work at Sundvollen Hotel (the assembling place for survivors and relatives, near Utøya) is that on such occasions the Directorate of Health should send someone responsible for communications and media to the scene. Sundvollen Hotel was requisitioned as a support centre at an early stage, and Hole Municipality’s crisis team assembled there in order to receive the arriving teenagers. The medical care staff at Sundvollen were uncertain about who was responsible for communications and what should be explained, and by whom. A function that can address these issues quickly and strategically would have been valuable.

Representatives of Ringerike Hospital stated after the event that it is extremely important to have specially appointed personnel who manage communications and media matters, even at smaller hospitals. In addition, the police could not be contacted in this case, and the hospitals were kept altogether too poorly updated about the course of events. Hospital staff kept themselves informed primarily via the internet, radio and TV, which once again emphasises the need of a media centre to satisfy the internal need for communication. According to a central
source at the hospital, a contingency preparedness can be useful because “the press is only interested in scandals and royalty”. The fact that a small provincial hospital treated 35 seriously injured people did not, however, receive a great deal of attention by the media.

MANAGEMENT DURING CRISIS
Those in charge at Ringerike expressed that the disaster strengthened team spirit, despite the tragic circumstances. For the personnel, the situation proved that a hospital needs a manager at the scene. This is also very important for the communications situation, or as one source said: “A doctor cannot be remotely controlled – you have to live with those that you shall control”.

Allegedly, the communications work was characterised by the expression, “Nobody assumes leadership if the senior doctors do not”. This means that the workers with extensive experience often become natural leaders in difficult situations when the regular work managers are not present. A previous Senior Consultant was called in and given the task of managing the press. The disaster plan functioned without problem with the specific exception of contact with the press, where preparedness was worse. The hospital considered that the situation was managed well regardless, and with great flexibility, especially considering that a hundred or more journalists – reporters and photographers – from different countries were gathered at the scene.

BOTH ACCORDING TO THE PLAN AND FLEXIBLE
An organisational and strategic communications problem that became evident is the somewhat complex Norwegian medical care organisation. At a large hospital such as Ullevål, the majority of things could be performed in accordance with the crisis communications plan. At Ringerike, the emergency plan was followed in detail, but communications and media management seems to have been somewhat more improvised, even though the results were good.

The municipal emergency services and centre at Sundvolden Hotel complied formally with the respective municipalities’ crisis communications plans. This was generally applied in Oslo, but the work at Sundvolden was organised essentially without any communications support and neither the police nor municipality contributed any communications resources. Despite this, and the fact that there was no written guidance regarding the communications work, everything functioned very well. Sometimes common sense, attentiveness, flexibility and some imagination go a long way.
MEDIA EXPOSURE OF SURVIVORS AND PATIENTS

Good media preparedness entails not simply “managing” the media, but also giving their representatives suitable working conditions in the form of premises to work in as well as access to electricity and the flow of information. However, this type of press centre must be chosen carefully. At Ullevål Hospital, a premises located in a building that is separate from the Emergency Department and the care wards, which protected the patients from media exposure. At Ringerike Hospital, the journalists were given a room connected to the care wards, which might have placed them too close to the patients. Several patients at Ringerike were also given exposure through early interviews and images, and the question may be asked whether the care personnel protected their patients to a sufficient extent. When a doctor states that “the youth use media to debrief themselves”, the protection must probably be considered to have been poor.

The personnel at both Ullevål and Ringerike claimed that they attempted to dissuade young patients from speaking to the media on several occasions during the first twenty-four hours, but that many young people took the initiative themselves. Patients of legal age were allowed to decide for themselves, but sometimes the parents also instigated the media contact. The medical carers cannot be accused of insufficient protection or ethics in such a situation. Personnel at Ullevål implemented two interesting and creative measures that were not mentioned in any crisis plans: Red tape on the hospital floor marked a boundary for journalists, and white sheets were hung in windows to provide protection of privacy.

The circumstances were different at the Sundvolden Hotel, and no press centre was established despite the enormous media gathering. The information from crisis management to the media, however, was systematic and functioned well with the municipality director as spokesperson. In contrast, the small number of young people who came out from the hotel and met the media became ‘fair game’ at an altogether too early stage. They were still extremely vulnerable so close to the incident, which the media may have been perceived to exploit in an unethical manner. At the same time, the world seemed to hold its breath in wait for the first eyewitness accounts, and the pressure on the media was intense.

The media reporting was also quickly characterised by the ability of some of the young people to meet evil with love, for example, the young woman who said that “if one man can show so much hate, think about how much love we can show together”. The statement was inscribed on a monument nearby the bridge Utvika (arrival site for the evacuees, approximately 600 meters from the Utøya jetty). The media contributed to spreading this and similar positive, self-reinforc-
ing images, and many volunteers think that this facilitated both the individual and collective crisis management after the incident.

SOCIAL MEDIA
The majority of those interviewed think that their respective organisations must become better at using social media quickly and systematically when crisis incidents occur. Experiences from the 22 July demonstrate both the public’s wide usage of social media in crisis situations and also the speed and impact that they have when an authority is the sender. The media use social media as sources to a large extent, but authorities do this to a lesser degree. Ullevål Hospital has come furthest in this regard, through having used Twitter and to some extent Facebook, to search for blood donors, among other things. After the 22 July incidents, the Oslo Police has established a Twitter account in order to provide continual information about incidents and accidents.

INTERNAL COMMUNICATION
Internal and external communication shall be managed in parallel and synchronisation, which can probably be considered as common sense in the majority of communications operations. Within communications theory it goes without saying, and the same applies to the current use of modern digital channels (Coombs, 2012). Personnel should not need to rely on media in order to obtain information about incidents that concern their work efforts or workplace. This information should come from within the organisation. But, it is often not the case in reality, for several reasons. In a crisis situation it is necessary to prioritise and the external is always discarded first on these occasions. Internal communication is primarily verbal, through quick progress meetings, for example. There are, in addition, many working at hospitals that do not have access to computer-assisted communication. Text messages may work, or internal TV screens, but these methods are seldom particularly developed. If incidents occur outside of regular working hours and with low staff levels at the workplace, internal communication is perhaps even more lowly prioritised. On the 22 July, many of those who worked with rescue efforts, care and communications received their first hand information from the media.

AREAS FOR IMPROVEMENT
From a communications perspective, it is likely that both the Norwegian and Swedish medical care profession can become better at utilising the speed of the media in the crisis management work. The care profession shall not simply “manage the media” in the sense of satisfying their requirements, providing them...
with information or keeping them away from incident scenes, but shall include an active utilisation of and interplay with the media in a good emergency preparedness plan. This may relate to “accepting” the media’s speed and utilising their alarm function, actively using both traditional and social media as information channels and, not least, crisis staff following the media reporting themselves in order to stay updated. It should be taken for granted that a media room is incorporated into every crisis communications staff. As at Oslo University Hospital, a function in the crisis communications staff should be assigned to follow the media reporting intensively and report internally on the important parts within the organisation. This also relates to how the medical care profession is portrayed in the media. Furthermore, the health and medical care profession may notice any incorrect facts and act quickly to have them corrected in the relevant media.

In Norway, Oslo University Hospital used Twitter as a channel for both the press and the citizens. It is likely that in many cases the Swedish medical care profession’s communications plans need to be updated in order to meet the needs of a more modern media situation. One issue to be examined is the potential need to include procedures for Twitter, Facebook and text messaging in the emergency preparedness plans. In addition, it is of great value to produce rules for how to relate to patient interviews on the hospital’s premises (care rooms), as well as for situations when patients take the initiative themselves to make contact with the media. It is also worth examining whether the hospital has a realistic emergency preparedness for an international media presence, and whether procedures exist for the establishment of a press centre that is located some distance away from urban areas.

CONCLUSIONS
Based on the information which has emerged regarding communication and media management linked to healthcare and medical operations, the following conclusions could be drawn: Communications preparedness is an extremely important part of general emergency preparedness. An emergency plan should include descriptions of functions, routines for internal and external communication, media relations at the incident scene and hospitals, as well as preparations for the handling of international media attention. The media’s function as a form of alarm and as a source of information is significant in the event of serious incidents. The citizens themselves also have an important alarm function as text, Twitter and Facebook messages sent via mobile phones are often a fast and effective way of reaching many different kinds of recipients: affected, relatives, friends, the media and even staff at hospitals, the police and other authorities. Media attention should be monitored internally during the acute phase and the period immediately after. Monitoring the media coverage could reduce risks of
myths and disinformation. The emergency plan of every hospital should include a stance with regard to patient interviews. This makes it easier for staff to refer to rules, which can provide both them and patients with a certain respite from the media.

Communicating risk can both be help and harm to the crisis management. Learning from earlier events will be embedding for a better crisis management as well as a better risk perception and management among the citizens.

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Memory stone at Utvika, opposite Utøya at Tyrifjorden, Norway. The inscription: “If one man can show so much hate, think about how much love we can show together”.

Photo: Liselotte Englund
Parallel tracks enhance workplace health promotion and capacity building for sustainable workplaces

Margaretha Strandmark

ABSTRACT
The aim of this chapter is to describe the concepts of workplace health promotion, community capacity building, and empowerment in order to build capacity for sustainable workplaces. According to the Ottawa Charter, health is a resource and a positive concept. Put simply, workplace health promotion produces healthy people in healthy organisations. Community capacity building comprises the generation of skills, commitment, structured systems, and leadership that facilitates effective health promotion. Capacity can be built through psychological, community, and organisational empowerment. A balance between top-down and bottom-up organisational approaches is needed for the creation of health-promoting workplaces, since individuals as well as organisations are involved. Parallel tracks, where a top-down approach is tied in with empowering actions, might offer a solution.

INTRODUCTION
Work is a sizeable part of an employee’s everyday life, and involves a great deal of human interactive processes. These processes may well lead to personal and organisational development, but might also result in stagnancy or regression in the development of individuals and the organisational setting. This chapter will describe the concepts of health promotion, workplace health promotion, community capacity building, and empowerment. Practical benefits ensuing from empowerment and parallel tracks as well as examples of health-promoting workplaces are also illuminated. The aim, founded on the intentions of the Ottawa Charter, was to promote the building of individual and organizational capacity, and hence includes, beside the descriptions, also practical actions to be taken.
HEALTH PROMOTION
At the initial conference of health promotion, held in Ottawa 1986, a charter aimed at achieving health for all, was introduced. This charter states: “Health promotion is the process of enabling people to increase control over, and improve their health”. An individual or a group must be able to identify and realise efforts to satisfy identified needs, and also to change or cope with the environment. Therefore, health is seen as a resource for everyday life, not the objective of life. Health is a positive concept that emphasises social and personal resources as well as physical capacities. Health promotion does not solely involve the responsibilities of the health sector, but reaches beyond healthy lifestyles toward wellbeing. Improvement in health requires fundamental conditions and resources for health, including peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity. Prerequisites for health promotion actions comprise the key words advocate, enable, and mediate. These actions strive towards making political, economic, social, cultural, environmental, behavioral, and biological factors advantageous, through health advocacy. The aim is to reduce the differences in current health status, and to increase equal opportunities and resources, thereby enabling all people to reach their fullest health potential. Adequate health promotion needs coordination by governments along with health, social, and economic sectors, and also nongovernmental and voluntary organizations, local authorities, industry, as well as the media. Professionals and social groups have a certain responsibility to mediate between different interests in society in the pursuit of health. Health promotion actions involve the formulation of a healthy public policy, creating supportive environments, strengthening community actions, developing personal skills, and the reorientation of health services (WHO, 1986).

During the 1990s, the development of health promotion in Europe displayed a positive disposition to increased awareness of the need to develop health promotion in accordance with the Ottawa Charter. Member states displayed more action and a larger interest in developing settings-based programs, and the number of health promotion activities outside the health sector was enhanced. However, negative tendencies were also obvious, resulting in minor space being granted to health promotion in healthcare reform processes. The budget specifically allocated to health promotion was insufficient. Institutional arrangements for developing a health promotion policy and its implementation were indeed inadequate. Sub-national centres and agencies for health promotion were furthermore too curbed to function as strong players in the implementation of effective and sustainable actions in accordance with the Ottawa Charter. Programs were often issue-based and constructed ad hoc. Finally, only few member states offered health promotion training (Ziglio, Hagard & Griffiths, 2000).
An overview of health promotion literature in Europe 1995-2005, estimated that a total of 6935 articles were produced during this period, numbers per year rising from approximately 400 in 1995 to 1400 in 2005. The United Kingdom produced the most. Sweden, the Netherlands, and Germany produced between 500 and 600 publications. The studies revealed that the production of health promotion research was only marginally linked with the relative health need, the burden of disease (DALY). The number of articles produced in Sweden and Finland was in line with the observed health needs, in contrast to the relatively low output in the countries of Eastern Europe. Twenty five per cent of the publications concerned disease prevention, while diet and physical activities dominated in the remaining studies. Other topics included tobacco and cardiovascular disease, accidents and violence, alcohol, and mental health. The researchers found that due to its width, the definition of health promotion was difficult to translate into search strategies. It was also difficult to separate disease prevention from health promotion, and to determine where the borders with other areas went, for instance, with occupational health. They suggested more evidence-based studies in the future, and health promotion research in relation to health needs, and also studies to explore exactly within which areas health promotion will yield benefits (Clarke, Gatineau, Thorogood & Wyn-Roberts, 2007).

Health promotion failed to prove its effectiveness in Canada, particularly in financial terms, and hence their approach has changed from health promotion to population health. Furthermore, the conceptualisation of population health is rather close to health promotion, but is expressed through a classic scientific vision and the language of economists, rather than supporting health promotion by different scientific paradigms, and with a social vision. The rhetoric of health promotion has not always offered a clear analysis of the determinants of health, which has opened the way up for various interpretations and means of usage, particularly in health reforms. The settings approach, as a strategy for health promotion policies and programs, has not formally been adopted, and neither has the concept of healthy workplaces. Emphasizing similarities rather than differences between population health and health promotion (two manifestations of the “new ecological public health”), might prove fruitful. Maintaining the commitment to health-promoting policies, and creating alliances between old and new health promoters, remain challenges for the future (O’Neill, Pedersen & Rootman, 2000).

Building on the Ottawa Charter, the Bangkok Charter for health promotion identified new commitments: making health promotion central to global development; governments having core responsibility; health promotion being a key focus for communities and civil society; and clarifying requirements for good corporate practices. Of consequence, the Bangkok conference found, were
building capacity beyond community and skills development into sustained health promotion capacity in global and local policies, public/community/corporate partnerships and alliances, finance and information systems, and trade considerations. Building institutional capacity through a conducive environment is another crucial challenge for the future. Further development of health promotion is a global matter in the context of sustainability, and requires resilient, and persistent action at local, regional, national, and international levels (de Leeuw, Tang & Beaglehole, 2007).

In summary, the challenges of health promotion comprise global health promotion, evidence-based research, the building of alliances between old and new health promotions, and building institutional capacity.

WORKPLACE HEALTH PROMOTION

“Health is created and lived by people within settings of their everyday life; where they learn, work, play and love” (WHO, 1986). Consequently, a workplace is a setting where workplace health promotion may be initiated and perceived as a resource for the employee and the organisation. According to the Luxembourg Declaration, workplace health promotion includes efforts of employers, employees, and society to improve the health and well-being of people at work. These goals are attained by combining an improved work organisation with an improved work environment, and by promoting active participation and encouraging personal development, not only in theory, but actually also in practical programs. A healthy work environment is a social process, and is a result of actions taken by various stakeholders and outside enterprises. Leadership and management practices, based on a participative culture, are the vehicles of this process. Decision-makers’ strategies and policies, quality of work environment and organisation of work as well as personal health practices determine healthy workplaces. Healthy work environments contribute to the protection of communities’ and populations’ health and also improve social and economic development at a local, regional, national, and European level. Workplace health promotion may attain the label “healthy people in a healthy organisation” if all staff members are involved; the promotion is integrated into all important decision-making in all areas of work and in all areas of the organisation; and if all measures and programs are oriented toward problem-solving models, containing individually as well as environmentally directed measures. In terms of the latter, it should involve a combination of risk reduction strategies and development of protection factors and health potentials (ENWHP, 1997/2007).

Sweden has a long tradition of striving for occupational safety and healthy workplaces (Bjurvald, 2004). In the early stages, workplace health promotion focused basically on illness, risk factors, and the lifestyle habits of individual
employees. Environmental, social, and organisational health determinants were generally overlooked. In recent years, however, workplace health promotion has been oriented toward a more holistic, integrated approach, involving both workers and management, in an effort to transform the workplace into a health-promoting setting.

CAPACITY BUILDING AND WORKPLACE HEALTH PROMOTION AT SETTINGS

One way to attain health-promoting workplaces is to build capacity in the organisation. Community capacity is generated through knowledge, skills, commitment, structures, systems, and leadership that enables effective health promotion. It requires actions at three levels: improving the knowledge and skills of practitioners; extending support and infrastructure for health promotion in the organisation; and developing unity and partnerships for health in the community (Smith, Tang & Nutbeam, 2006). In other words, it involves individual and organisational factors as well as network-building. The term community capacity originates in the desire to strengthen community health promotion through empowering, and bottom-up approaches, as opposed to the pathology approach and top-down agendas (Ræburn, Akerman, Chuensatiansup, Mejia & Oladebo, 2006). Mittelmark et al. (2007) emphasise mapping capacity on a large scale with local variation, while Labonte and Laverack (2001a) hold that multiple methods, for instance workshop methodology, would be a practical and significant aspect of developing community capacity for health promotion.

Community capacity building includes actions at both a national and a community level, and has in later years come to include even policy reviews. It embraces the concepts of capacity and empowerment; bottom-up, community-determined processes and agendas; as well as processes for developing community competence. In this context, cognitive, behavioural and political dimensions are accentuated, but leading authors also highlight social relationships, such as networking, support, social cohesion, social capital and a sense of community. A precondition for successful capacity building is the attainment of a balance between global macro actions, like national policies and actions at individual/local level. Empowered, self-determined community action in a balanced, collaborative environment of supportive government agencies, organisations, and policies, might be the optimal strategy for developing health promotion. Human capacity must never be underestimated (Ræburn et al., 2006).

Individual capacity building, in terms of reinforcing practitioners’ knowledge and skills, concern the ability to act, think, and decide, but also involves the creation of arenas for dialogue and reflection, where sustainability and empowerment can be achieved (Springett, 2001). A dialogue commences when two or
more people communicate with each other, and communication offers potential liberation for oppressed people. People are developed in their ability to speak, work, act and reflect. Founded on love, humility, and faith in human beings, the dialogue becomes a horizontal relationship in which mutual trust grows between partners, as a logical progression (Freire, 1972). Organisational community capacity building may be evolved through the use of a dialogue tool that includes a work-experience measurement scale and applying a salutogenic approach centring on positive experiences of work facilitates health promotion at workplaces. Such a tool, when used as a continuous questionnaire process, holds a potential for assessing workplace health promotions (Nilsson, 2010). Embracing patient-centered interactions and face-to-face collaborations are examples of actively shaping a learning culture. Patient-centred interaction entails breaking down traditional expertise patterns in the form of information and medical investigations and changing communication patterns with the employee into a more coach-like interaction. Setting up empowering meetings at workplaces raises the employees’ awareness and yields new ideas of how to support the patient. Face-to-face collaboration visualises existing prevention links and identifies obstacles and opportunities for applying a comprehensible preventive and supportive approach. This approach builds a sense of possible prevention due to employees’ experiences of coherence, loyalty, and pride of the community (Hjalmarson & Strandmark, 2012).

Labonte and Laverack (2001b) outline nine domains of organisational, community capacity building: participation, leadership, organisational structures, problem assessment, resource mobilization, asking why-questions, linking with others, establishing the role of outside agents, and program management.

These are all fundamental factors in building community capacity. Participation in groups and organisations, joining other promoters such as social networks and support systems, improve self-esteem and social esteem and reduce isolation. There is a close relationship between participation and leadership. Leadership based on participation requires strength. Without leaders, community members are less inclined to mobilise internal and external resources, and may be reluctant to speak with authority to influence decisions concerning health. Participation requires organizational structures. An organization can be experienced as healthy or unhealthy by employees, depending on hierarchy, decision-making practice, clique-development, and management of conflicts. Ineffective organisations are less capable of mobilising internal and external resources, providing social support and network/building, and exert less influence on health-determinants. Capacity building embraces a model where problems are resolved by the community, and entails identification of the problem, suggesting solutions, and taking action to resolve the problem. This process may promote a sense of self-determi
nation and power within the community. Critical assessment of social, political, economic, and other inequalities are crucial stages in the development of strategies for personal and social change. The ability of the community to mobilise and negotiate outside resources can be helpful in capacity building. The degree of economic and ecological interdependency provides a scope for the organization to build capacity. Occasionally, however, the generation of internal as well as external resources is a matter of individual capacity. Partnerships, coalitions, and voluntary alliances between the community and others may assist the community in building capacity. At the individual level, health is associated with a person’s social network, which is considered an element of social capital and can have health-enhancing effects. The outside agents transform their power relationship with the community into capacity building, whereupon authority of the community program is reinforced. Practitioners’ imposition experts create psychological power over others through assumed superior knowledge. The program for capacity building management contains for instance clearly defined roles, responsibilities, and lines of management for all stakeholders. Improvements in health are related to employees’ perception of their own authority and power. The capacity domains are health promoting in their own right as vehicles for participation, as venues for developing leadership, and as starting points in a new organizational development depending on whether hopelessness, loss of meaning or purpose, and poor health outcomes are involved (Labonte & Laverack, 2001a; Labonte & Laverack, 2001b).

THE CONCEPT OF EMPOWERMENT AND CAPACITY BUILDING AT WORKPLACES

Individual and organisational, as well as practical and theoretical, capacity-building are all linked to the concept of empowerment. This entails both psychological and community empowerment as well as empowered organisations. Psychological empowerment includes personal trust, personal development, and a willingness to participate in collective activities and organisations. In general, community empowerment means that people experience more control over decisions that influence their health and lives. It includes political, collective, and social action, as well as psychological empowerment. Empowered organisation refers to activities within an organisation that generate psychological empowerment, fend off threats from society, improve the quality of life, and that facilitate the participation of the citizens (Zimmerman & Rappaport, 1988; Rissel, 1994; Laverack & Labonte, 2000).

Research has focused on the individual level of empowerment rather than on structures, processes, and outcomes on the organisation and community levels. Organisational empowerment refers to efforts that generate psychological
empowerment among the stakeholders and that lead to effectiveness in achieving organisational goals. Empowered organisations comprise intra-organisational, inter-organisational, and extra-organisational components. The intra-organisational components concern characteristics of internal structure and the functioning of the organisation. These components provide the infrastructure for stakeholders, allowing them to engage in the pro-active behaviour necessary for goal achievement. Inter-organisational empowerment creates links between organisations, and refers to relationships and collaboration across boundaries. The extra-organisational components refer to organisational action taken in order to affect larger environments that the organisation is part of, and represent organisational efforts to exert control. Examples of such action include policy changes, the creation of alternative services, and successful promotions (Petersen & Zimmerman, 2004).

Accordingly, empowerment can be defined as an individual strength that, in alliance with other participants within the collective, yields the ability to influence the organization from a bottom-up perspective. This is a central aspect of health-promoting workplaces, and plays a significant role in employees’ job satisfaction, organisational commitment, job performance, and stress reduction (Butts et al., 2009). The effectiveness of empowerment strategies is recognized by improved health and reduced health disparities. Much research has focused on empowerment of socially excluded populations. Successful empowering cannot be fully standardised across multiple populations, but must be created in, or adapted for, local contexts (Wallerstein, 2006). Nonetheless, a review of Nordic research from 1986 to 2008 disclosed that intervention studies focused on preventive medicine rather than on health promotion as defined by the Ottawa Charter (WHO, 1986). Many of the studies had an individual focus, in terms of changing employees’ lifestyles or behaviours by using a top-down approach, avoiding settings-related factors and the empowerment of employees (Torp, Eklund & Thorpenberg, 2011).

Empowerment strengthens sustainable health-promotion actions, because it holds the capacity to maintain the benefits for communities and populations beyond the initial phase of implementation. These actions may well continue despite the limits of finances, expertise, infrastructure, natural resources, and participation of stakeholders. Sustainable health promotion strategies are compatible with the natural environment in which they are delivered, and do not lead to unintended threats to the health of future generations (Smith, Tang & Nutbeam, 2006).
“PARALLEL TRACK” FACILITATES COMMUNITY CAPABILITY AT WORKPLACES

Balance between individual and organizational action is necessary for attaining community capability at workplaces. Empowerment is an act that exists in relation to power. In professional practice, power is defined as “power over” and “power with”. “Power over” depicts the reality of matters such as disease, health behaviour, and risk factors, while “power with” refers to the reality of lived experience in the language, images, and symbols that people use (Labonte, 1994). Several health promoters exert power over the community through “top-down” programs, at the same time using the discourse of the Ottawa Charter. This creates a tension between the discourse and the practice, as little attention is paid to the methods by which empowerment can be put into operation in top-down programs. Two different discourses co-exist in health promotion. The conventional discourse focuses on disease-prevention by means of lifestyle management, or control of infectious diseases. A more radical discourse emphasises social justice through the community, by empowerment, and advocacy. This discourse uses a bottom-up approach, while the conventional discourse, with health promoting programs, utilizes a top-down approach. Top-down programs comprise an overall design; setting of objectives; strategy implementation; management; and program evaluation. In bottom-up programs, the outside agent assists the community in identifying issues that are relevant to the employees’ lives, enabling them to develop strategies for resolving these issues. The designer and the management negotiate with the community, and extended time is often required for planning this type of program (Laverack & Labonte, 2000).

Laverack and Labonte (2000) argue that in the context of top-down programs, an empowerment “parallel track”, running alongside the conventional program, reinforces community empowerment, integrating goals into the organisation (Figure 1).
A parallel track comprises five components: 1) Strategic and participatory planning that involves the participants and increases the empowerment in the program design. 2) Program objectives, albeit varying, reflected in empowerment objectives and outcomes. 3) A strategic approach to empowerment involving the formation of small groups; the development of community organisations; the strengthening of inter-organisational networks; and political action. 4) Feasible and practicable methods for strategic planning and evaluation of the management and implementation of community empowerment programs. 5) Process-
oriented assessment rather than assessment of any specific outcome, where the process itself constitutes the outcome (Laverack & Labonte, 2000).

Below follow two bottom-up approaches that may be interpreted as parallel tracks. Hjalmarson, Åhgren, and Strandmark (2013) published a study on an inter-professional collaboration in a qualitative and quantitative, longitudinal case that concerned secondary prevention for patients with osteoporosis. Qualitative data were collected from documents as well as from field notes written down during workshops and learning circles. Statistical and quantitative data were retrieved from a register, and were scrutinised through telephone interviews. A content analysis was conducted on the qualitative and quantitative data, while the data from the register were statistically analysed. Four themes emerged, relating to structure, process, outputs, and outcomes of the inter-professional collaboration. The structure of the bottom-up approach displayed a horizontal composition and allowed professionals freedom to act and an evolving leadership style. The process demonstrated continuous feedback, which activated inter-professional motivational forces. The output disclosed inter-professional innovations and shared values. The outcome was inter-professional transparency and collective control. The four themes were generated by data source triangulation. Inter-professional collaboration was facilitated by a bottom-up structure that stimulated innovative processes for secondary prevention. A structure where leaders and coworkers develop interdependency requires focus on inter-professional interaction. Measuring collective performance and applying inter-professional motivational forces appeared to be imperative steps. Nonetheless, some top-down actions were observed in the inter-professional collaboration, e.g. provision of resources; collaborative support; sustained, evidence-based work; and continuous feedback. In summary, a balance between bottom-up and top-down structures triggered improvements in inter-professional collaboration.

Strandmark and Rahm (2014, in press) developed, implemented, and evaluated a process for preventing and combating workplace bullying. The research project followed a community-based participatory approach. Data were collected through focus group interviews and analysed using Grounded Theory methodology. The interventions and the implementation comprised: one half-day seminar on the definition of bullying, feelings of shame, conflict management, and communication; playing cards in small groups; developing an action plan; presentation and discussion of the action plan among the managerial groups; and finally, a discussion about whether the implementation process had succeeded or not. The analysis showed that the immediate supervisors, in collaboration with co-workers and the upper management, were in the best position to counteract and combat bullying. The goal “zero tolerance toward bullying” was attainable if all involved worked together to apply humanist values, an open atmosphere,
group collaboration, and conflict resolution. The evaluation after implementa-
tion revealed that employees had become more aware of bullying problems; the
atmosphere in the workplace had improved; collaboration between and within
groups had become stronger; and supervisors now worked continually to prevent
and combat bullying and upheld humanist values, as suggested. A participant
said:

“You had good training. It gave you strength and made you very capable.”

Systematic efforts to implement the complete action plan and conflict resolution
system were, however, missing. Some co-workers were disappointed that upper
management appeared not to involve themselves in workplace issues. Although
the researchers informed upper management about their findings on three sepa-
rate occasions, this appears to have been insufficient. It might have been advis-
able to invite the organisational leaders to the lectures and the training sessions.

CONCLUSIONS
Workplace health promotion is a concept which encompasses individual and
organisational contexts, as well as practical and theoretical contexts. A twin
foundation for health promotion, consisting of workplace health promotion and
community capacity building, emphasises personal development, active participa-
tion, strategies, policies, leadership, extended support, and networks as essential.
Empowerment builds community capability. Employees and upper management
need to become involved in genuinely health-promoting workplaces. Both,
top-down and bottom-up strategies are necessary to be balanced in order
to create health-promoting workplaces, since individuals as well as organisations are
involved. Arenas for dialogue and reflection in connection with empowerment
create the conditions for sustainable workplaces. Neither qualitative nor quanti-
tative studies can, on their own, come to grips with the complexity of capacity
building in the workplace. Indeed, research on workplace health promotion re-
quires a multiplicity of methods in combination to obtain adequate and reliable
results.

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Heritage at Risk? The devastating effects of mechanised forestry on local heritage

Eva Svensson

ABSTRACT
A large number of ancient monuments in the Swedish forest are damaged every year due to the mechanisation of forestry. While the threat to ancient monuments has existed for many years, the issue has not gained attention until recently. This paper asserts that this threat to national heritage should be interpreted as part of a larger risk scenario, namely the urban domination of sparsely-populated, forested areas and that these ancient monuments would not have been destroyed at the same rate if they had been closer to the city. Since local heritage contributes to community pride and act as local arenas for social interaction, heritage destruction entails losing important cornerstones of society.

BACKGROUND
On 5 June 2014, the Swedish news agency TT (TT Nyhetsbyrån) reported:

An inventory of 372 areas in Sweden where logging had occurred, and with more than 1100 archaeological and historical remains, shows that almost half of the remains have been affected or slightly damaged and that a quarter have been damaged or grossly damaged.
The inventory was made three years after logging. The main sources of damage were vehicle damage, logging residues, planting and loosening of the topsoil. Most damage was recorded along the coast of Norrland, in northern Sweden, while Svealand, further south, had the lowest proportion of damage. The inventory was carried out by the Forest Commission and the National Heritage Board, who stress that damaging ancient monuments is against the law. They asked forestry workers and forest owners to be more observant and make use of existing e-services displaying ancient monuments on maps.

The report on which the news was based (Ulfhielm 2014) had been preceded by similar reports and news headlines stretching as far back as the year 2000 (Riks-
antikvarieämbetet 2000, see also Riksantikvarieämbetet 2006, Ulfhielm 2013). However, both the problem and the awareness of the problem go back much further. Inventories of ancient monuments were carried out by the National Heritage Board throughout most of the 20th century (and this author participated in many of them); and it was common knowledge that ancient monuments in the forest often ended up damaged to some degree. The condition of ancient monuments was duly described in the register of ancient monuments, FMIS (Fornsök), but no action was ever taken.

It may appear obvious that the mechanisation of forestry is to blame, and of course this would be a correct assumption. However, things become more complicated when it is pointed out that nobody actually intends to damage ancient monuments, and that most people treasure their local heritage. Forestry workers are no exception, and they are usually willing to make efforts to avoid this from happening (cf. Svensson 2010). Therefore, the question remains: Why does mechanised forestry damage ancient monuments, and why are appropriate measures not being taken?

In order to answer these questions, this paper will investigate the context surrounding ancient monuments in the forest.

Figure 1. Slag heap (from bloomery iron production), planted over with spruce. Photo: Eva Svensson.
INTRODUCING HERITAGE,.....
For most people, heritage is related to history, and perhaps to the artefacts of history in the shape of ancient monuments, old buildings, places of special interest, etc. But there is also an intangible heritage in the form of folklore, traditions, myths and rituals; and then there is our natural heritage which includes natural implements of historical or traditional value, culturally significant landscapes and biodiversity (since biodiversity is related to the human use of nature). Heritage is inherited from past generations, preserved in the present and bestowed on future generations (Kulturarv).

In Sweden, ancient monuments have been protected by the law since the late 17th century, with registrations initiated at the same time. This early interest in the monuments of the past was due to the contemporary need of the young Swedish empire to boast of a grand past in order to legitimise success on the battlefield. What would be classified as a heritage monument was thus from the beginning mainly to be the artefacts of the rich and powerful. Castles, rune stones and big burial mounds were obvious heritage monuments, whereas the monuments to the labour of the common people such as crofts, charcoal stacks and clearance cairns were not. This asymmetric way of viewing the past is still prevalent in the heritage sector. It is common to all countries and is labelled Authoritative Heritage Discourse (AHD, Smith 2006).

The asymmetric focus on the material legacy of the rich and powerful has not only caused unequal historical rights along the lines of rank (and gender), but along the lines of the natural landscape conditions: cereal cultivators and urban dwellers have generally been ascribed greater importance (Svensson & Skoglund 2010). In forested regions, ancient monuments such as castles, rune stones and big burial mounds are rare, while crofts, charcoal stacks and clearance cairns are plentiful.

Heritage in the forest has not only been considered less important than the heritage of open landscapes, it has also been thought to be more recent. Yet the Swedish Ancient Monuments Act stipulated until recently that age was of no importance, and that everything that has been created by man and permanently abandoned was to be protected (KML 1988). However, in practice, sites from the 18th and 19th century have rarely qualified as ancient monuments, unless they were artefacts of the rich and powerful or iron and copper plants from the Swedish nation’s glorious past.

The Swedish Ancient Monuments Act has been changed (KML 2013) to protect all remains dating from before 1851. The amended legislation has led to many, but not all, crofts, charcoal stacks and clearance cairns being declared ancient monuments. In fact, the amendments to the Ancient Monuments Act
will have their biggest impact on forested landscapes, since these are rich in remains of various kinds that have been subject to legal reclassification.

Figure 2. The ruins of a deserted croft, now surrounded by spruce plantation. Photo: Eva Svensson.

...FORESTS...

Conventional views on forests imply notions of periphery and wilderness as well as of resourceful production environments, which provide pasture, wood, energy and minerals. Forestry, in particular, is an important economic activity focusing on forested environments, and there have always been strong views concerning the forest as a resource, just as there have always been advocates of biological diversity in the forest.

In 1994, the Forest Act was radically amended, from an ideological point of view, so that environmental concerns would enjoy equal importance as production interests. Heritage, including heritage not protected by the Heritage Act, was included in the environmental concerns addressed in Paragraph 30 of the Act (SVL 1993). Heritage had hitherto been an unknown area for the Forest Commission, and officials with competence in heritage management had to be recruited by the Commission in order to meet the new legislative demands.

Indeed, the Forest Commission went even further, as it was soon discovered that the inventories and registrations in forested areas were inadequate for good management. The Forest Commission started an inventory project on their own, Forest & History (Sw. *Skog & Historia*), using resources marked for labour market
measures. The project soon encountered a large number or remains that had to be recorded and evaluated, and decisions had to be made as to whether they were to be classified as ancient monuments under the Heritage Act or as cultural historical remains to be taken care of by the Forest Commission under Paragraph 30 of the new Forest Act. This situation pushed an initially reluctant National Heritage Board out into the forest, but after some time the Board came to embrace Forest & History and make the project their own.

The new directions in heritage management, initiated by the Forest Commission, had a slightly older cousin in academic research pertaining mainly to archaeology and landscape studies. Research that departed from the inventory for ancient monuments carried out by the National Heritage Board. Resources were assigned to archaeologists to carry out an inventory in the forests of Värmland (a part of Svealand) but far fewer resources than out on the plains. The forests of Norrland were barely touched upon, as they were presumed to be of little interest in the search of traditional ancient monuments. In Värmland, the archaeologists came back from the forest with a rich collection of material. Some sites were selected for further research, although not all of these were traditional ancient monuments. Another hot spot for research was Ängersjö in Härjedalen, a small village deep in the forest and the centre of a large interdisciplinary project addressing different historical periods of and settings for Swedish forest life (e.g. Emanuelsson et al. 2003; Emanuelsson et al. 2008; Svensson 1998).

However, Forest & History came to an end a decade ago, at about the same time that archaeological and historical landscape researchers also left the forest. Current forest research is to a large extent oriented towards improved forestry, biodiversity issues and climate mitigation, but lacks research angles addressing historical and cultural issues. Recently, the government’s advisory board on Sweden’s long-term environmental goals put forward its first proposal (SOU 2013: 43). Critics have stressed that the proposal fails to address cultural and historical dimensions of the forest and that the proposed environmental policy might even threaten the forest’s bio cultural diversity and heritage.

Recent historical research in forested landscapes has been receiving attention from international environments. In countries such as Holland, Great Britain, the Czech Republic, Spain, Italy, Greece, France and Germany, outlying areas have come into focus, and scholars from these countries are requesting knowledge transfer from, and cooperation with, more experienced research groups from Sweden, Norway, Switzerland and Russia (see e.g. Ruralia 2009).

...AND RISKS
The German sociologist Ulrich Beck coined the expression “risk society” to describe the modern welfare state, where the struggle to earn one’s daily bread
has been replaced by the struggle to avoid threats, often invisible ones. Beck put forward the idea that risks have moved up the ladder of political importance, and that people in the modern welfare state increasingly organise themselves so as to cope with risks better (Beck 1992). I find Beck’s idea an important one, although I would like to modify it somewhat for the purposes of this paper. My suggestion is that the expression “risk” should be used to denote a combination of threats where the real solution lies in fundamental changes in society, even if individual threats can be mitigated. “Risk” would thus serve as an overarching concept, dependent on the structure and functioning of the society.

Risk as an overarching concept is making its way into the heritage and forestry sectors and gradually replacing the older approach that addresses specific threats only. There is a growing awareness of the usefulness of interpreting individual threats in a risk context, so that the effects of mechanised forestry on ancient monuments are more readily accepted as part of a larger scenario.

The main investigations into specific threats to heritage in Sweden and Norway have focused climate change (e.g. Riksantikvarieämbetet 2014, Risan 2010), and the effects of forestry on ancient monuments as presented above. But wider investigations into the condition of ancient monuments in general, carried out on behalf of various districts in Norway on a regular basis (see different reports, NIKU Rapporter) point out that most of the threats to heritage are caused by the urbanisation process. People are moving into towns, putting pressure on ancient monuments close to urban areas that are subject to development. The areas these people leave behind are in turn suffering from the abandonment of agriculture and ‘natural’ landscape management, leaving ancient monuments to become overgrown and forgotten (see e.g. Bøe Sollund 2014, p. 16).

The Norwegian investigations point out the important fact that heritage, and threats to heritage, are part and parcel of more general societal processes or risk processes. For instance, the threats posed to heritage by climate change would not exist if climate change had not been accelerated by human society. I would also suggest that the threats to heritage posed by forestry are part of more general risk processes, and that changes to society are required if real solutions are to be found, even if there might be some means of mitigating the effects of the threats.

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1 I restrict myself here to Sweden and Norway, as heritage practice and threats to heritage are fairly similar in these countries.
Figure 3. "Kulturstubbar" marking an ancient monument in the forest. "Kulturstubbar" are trees cut by the forest owner or the forestry worker, leaving a stump on the ancient monument about as tall as a man. "Kulturstubbar" are a Swedish invention, but according to information from antiquarians in Norway, "kulturstubbar" are starting to appear in Norwegian forestry, thanks to Swedish forestry workers working in Norway bringing the invention with them.

HERITAGE, FORESTS AND RISKS – OR POWER AND MARGINALISATION

Ancient monuments in forested areas often fall victim to mechanized, large-scale forestry and have done so for quite some time. At first, this appears, correctly, to be due to weak interest in the matter from both antiquarian and forestry officials. In Sweden, forested areas have in general been surveyed less intensively than the open, traditional agricultural areas usually considered cultural landscapes. Forests have normally been considered, if at all, second rate cultural landscapes (Svensson 2010).

However, the weak interest in heritage in forested areas needs to be put in context, and the context we are referring to here is the sparsely-populated forested areas of rural Sweden (Sw. Glesbygd). These areas, like some other rural landscapes in Europe, are often depicted as ‘other’ and as suffering from a lot of problems. Growth is slow; people, especially young people, are leaving; jobs are scarce; higher education is not available; and commercial and government services are gradually winding down. In an urban centristic world, people, knowledge, money and other resources are poured into cities, and urban values and experiences are
the norm. People living in the ‘distant’ sparsely populated areas become ‘the other’. This situation is not historically determined or a question of necessity - it is question of power (Mattsson 2011). And, as appears common, marginalised areas are more exposed to risks. Ancient monuments would not be damaged in the same number close to city.

Within the political establishment, there are two discernable attitudes towards sparsely populated areas and these became apparent in 2006 and 2007. The first approach, expressed in an appendix to a Long Term Inquiry (Sw.Långtidsutredningen), holds that measures for stimulating growth should be directed to areas that are already showing strong growth. As growth is greater in urban areas, it is in the nation’s interest to direct investment into urban areas. The alternative opinion holds that Sweden is able afford to support sparsely populated areas and that these may be of other, non-financial worth to society. This attitude was expressed by the Rural Committee inquiry (Landsbygdskommittén), from which came a number of suggested measures, including aid to small businesses and ecologically friendly enterprises, and facilities for (urban) visitors.

Although these approaches are seemingly in opposition to one another, they are in fact both urban products. They share the premise that sparsely populated areas need help form the outside if they are to survive. So far, the latter approach, i.e., aiding the countryside, has held sway, yet this approach has resulted in erratic, confusing and often short-sighted measures. Firstly, there has been a strong tendency to force sparsely populated areas to focus on adventure and culture tourism. Secondly, sparsely populated areas appear to be unique in the way that the responsibility for future development has been entrusted to individual enthusiasts to work on in their spare time as officials have moved out (Svensson 2010).

Experience in promoting heritage work in sparsely-populated forested areas strongly indicates that local citizens are burdened with a sense of inferiority and a lack of community pride vis-à-vis city-dwellers, but that they also question this implicit hierarchy. Often these protests are directed at nature conservation, which comes across as an urban exploitation of their home environment. For example, the wolf, a popular cause of nature conservationists and animal lovers alike, has become a symbol of urban power. Instead of taking political action to achieve real change, people hate the wolf (Svensson 2007, p. 194-195).

Sparsely populated, forested areas need many things, but I would like to point out two cornerstones of community building: community pride and arenas for local social interaction. Increased community pride is a source of empowerment, and local arenas for social interaction foster political action, creation of business ideas etc. The fundamental importance of community pride and local social interaction is mostly overlooked by politicians and government authorities, maybe
because they can neither be constructed by technical, administrative or economic means, nor measured successfully in figures and percentages.

There are no manuals to follow for promoting community pride and creating arenas for social interaction, but heritage can make substantial contributions. For the sparsely-populated, forested areas, local heritage offers alternative histories to the urban-based meta-history taught at school. Local heritage and local historical narratives both have the power to challenge the authoritative heritage discourse (AHD, cf. Swensen, Grete & Sætren 2014), and are sources of community pride. Experience indicates that heritage functions as boundary objects, and that heritage activities are meeting places for local citizens (Svensson 2010). Damaging ancient monuments also entails destruction of opportunities to challenge the authoritative heritage discourse.

Figure 4: Meeting place on the steps of an old and deserted croft site.
Photo: Eva Svensson

TO BE MARGINALISED IN FORESTED AREAS – A KIND OF CONCLUSION

Ancient monuments in the forest are damaged by the mechanised forestry industry, but the industry is run by people. The direct culprit is a man (at least nearly always a man) handling a forest harvester or other machine, a man who did not intend the damage. But he is often in a vulnerable position and working in conditions that many of us would find unacceptable. Often he is a former employee
of a big forest company, which has undergone rationalisation in order to raise profits. Like other sacked forestry workers, our forestry worker has been told by his former employer that he can make a living as subcontractor. In the modern urban world, being a permanent employee has fallen out of fashion, and the employee should whenever possible be replaced by the flexible entrepreneur. But in order to become an entrepreneur, our forestry worker first has to take a bank loan and invest in a brand new efficient machine.

Sadly for our forestry worker, there are many others doing the same thing, because they, too, need to make a living in their local area. The number of willing entrepreneurs makes for tough competition among them, and paid commissions are few. But mortgages still have to be paid, and food has to be put on the table. The foresters compete by dropping their prices and increasing their speed, in a model capitalist way. When working their machines in the middle of the night in the name of effectivity, ancient monuments on the forest floor can be hard to see.

For their part, antiquarians, with their offices in town, have seldom gone out into the forest and set up decent markers on ancient monuments. The “kulturstubbar” are a brilliant innovation (Kulturstubbar), but not the work of antiquarians. Instead, it is left to the forest owner or the subcontractor to select stumps, without any expertise in ancient monuments.

The damage to individual ancient monuments in the forest is the result of individual actions, but these actions are part of a larger context of urban power dominating sparsely populated areas. Sadly enough, our forestry subcontractor, unwittingly damages more than a physical monument; he also destroys a source of alternative history and a resource for local empowerment. And he unwittingly helps to preserve urban power over the sparsely populated forested area in which he lives.

REFERENCES
KML 1988, Lag om kulturminnen m. m., SFS 1988:950.
KML 2013, Lag om kulturminnen m. m., SFS 1988:950, changed SFS 2013:548.
Heritage at Risk? The devastating effects of mechanised forestry on local heritage


Risk management is a comparatively new, and most definitely complex, research field, combining knowledge from several other disciplines such as medicine, engineering, economics and psychology, to name a few. Consequently, risk management is important in a variety of subjects and disciplines, clearly illustrated in this festschrift. Professor Ragnar Andersson has played an important roll in not only promoting the importance of risk management and injury prevention, but also developing a deeper understanding of the field through always actively choosing a broad, multi-disciplinary perspective. In other words, he has always chosen “via spatiosa”. Or in Swedish, “den breda vägen”.