

Nonfatal injuries in a local context

- analysing social structures and perceptions in young people

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¡Hasta aquí me ayudo mi Dios!

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LIST OF ORIGINAL STUDIES

This thesis is based on the following original studies, which will be referred to in the text by their Roman numerals:

I	<u>Dale RA</u> , Hasselberg M, Petzold M, Hensing G. Alcohol environment, gender and nonfatal injuries in young people: An ecological study of fourteen Swedish municipalities (2000–2005) . <i>Substance Abuse Treatment, Prevention, and Policy</i> (Submitted Dec. 2011).
II	<u>Dale RA</u> , Hensing G, Petzold M, Hasselberg M. Nonfatal childhood injuries and their association with socioeconomic and gender structures: An ecological study of fourteen Swedish municipalities (2000-2005) . <i>Italian Journal of Public Health</i> , vol. 8, nr 1, 2011.
III	<u>Dale RA</u> , Hasselberg M, Jakobsson A, Hensing G. Children’s perspectives of injuries – a qualitative study in Sweden . <i>Journal of Pediatric Nursing</i> (In press, accepted for publication in Oct. 2011)
IV	<u>Dale RA</u> , Hensing G, Sverker A, Hasselberg M. Young adults’ lived experiences and management of “near injury situations” – a critical incident study in Sweden . <i>Journal of Youth Studies</i> (Submitted Nov. 2011)

LIST OF ABBREVIATIONS

BRA	Swedish National Council for Crime Prevention
CI	confidence interval
CIT	critical incident technique
DWI	driving while intoxicated
FHI	Swedish National Institute of Public Health
ICD-10	International Classification of Diseases, 10th edition
PCA	principal component analysis
PHC	primary health care centres
SCB	Statistics Sweden
SLISS	Skaraborg Local Injury Surveillance System
WHO	World Health Organization

ABSTRACT

Background: Injuries are a common public health problem in children and young people. The uneven distribution over gender and socioeconomic groups is partly explained by factors at both the individual and family levels, but sociocultural structures at the municipality level may contribute with yet unrecognised associations. If so, these associations might be important, since a large part of preventive work is done in municipalities. Few studies have included the perspectives of children themselves, who may be an important source of information in the development of new knowledge in this area. The overall aim of this thesis was to try to understand the relationship between the continuous interplay of individuals and their environment with the distribution of nonfatal injuries in young people. This thesis had two specific aims. The first aim was to explore whether the distribution of nonfatal injuries in young people was associated with the local sociocultural conditions, and the second to explore how children and young adults perceived and experienced injuries and injury risk situations.

Methods: The studies in this thesis were performed in Skaraborg, in the Southwest of Sweden. Two quantitative and two qualitative studies were included. A comprehensive health care register was used to estimate mean annual rates of nonfatal injuries and fractures by gender and age groups (2000–2005) for the quantitative studies. The local alcohol environment was assessed using indicators of access, consumption, and alcohol-related crimes in 14 municipalities. The local socioeconomic and gender structures were assessed using the following main components: relative poverty, relative wealth with male managerial dominance, narrow gender ratio in unskilled working positions and politics, and wider income distribution. Pearson's correlation coefficients were used to measure linear associations. The qualitative data were gathered in interviews. Six small homogeneous groups selected by gender and age (9, 13, and 17 years) were used to interview children and the critical incident technique was used for the interviews with young adults. Content analysis was used to analyse the interview data.

Results: Local alcohol access and local alcohol consumption were associated with the distribution of injuries in boys aged 6–17 years, while negative associations were observed between alcohol consumption and fractures in girls aged 6–17 years. None of the alcohol indicators were associated with injuries in young adults. Positive associations were identified between “narrow gender ratio at unskilled working positions and in politics” and injuries in both boys and girls aged 6–17 years. Negative associations were found between “wider income distribution” and boys' injuries. No linear association was observed between level of poverty and childhood injuries. Children usually attributed their injuries to personal and situational characteristics, although sometimes their injuries were ‘just inexplicable’. Children seemed to have a broad perspective on injury severity, including the psychological and social consequences of an injury. Three main categories characterized young adults' experiences with near-injury risk situations: performing under pressure, close encounters with more or less unexpected environmental factors, and while learning; and five categories summarized their ways of managing near-injury situations: escape, release control, confront, cry out for help, and do nothing.

Conclusions: The findings suggest the involvement of both individual and socio-cultural conditions in the distribution of nonfatal injuries in young people. On one hand, associations were found between socioeconomic and gender structures and the local distribution of nonfatal childhood injuries, and the strength of the area-level associations varied by sex, age, nature of injury, and type of socio-cultural condition studied. On the other hand, the children in this thesis seemed to have a holistic perspective of injury severity that health workers attending paediatric injuries should consider. Children's familiarity with the injury-risk situation seemed to decrease their awareness of potential negative consequences associated with the activity. Young adults' frequent exposure to new environmental conditions may increase their risk of injury, and their lack of experience might influence their subjective interpretation of the situation. The findings in this thesis can be seen as points of departure for future research and for the development of local injury prevention programmes.

SAMMANFATTNING

Bakgrund: Skador är ett vanligt folkhälsoproblem bland barn och unga. Den ojämna fördelningen av skador mellan könen och i olika socioekonomiska grupper kan delvis förklaras av faktorer på både individ- och familjenivå och familj. Emellertid skulle det också kunna finnas samband mellan skador bland barn och unga och sociokulturella strukturer på en kommunal nivå. Om så är fallet, kan ny kunskap om detta vara viktig, eftersom en stor del av det förebyggande arbetet sker i kommuner. Vidare har få studier inkluderat barnsperspektivet, vilket också kan vara en viktig källa till information i utvecklingen av ny kunskap inom det här området. Den övergripande avsikten med denna avhandling var därför att försöka förstå det kontinuerliga samspelet mellan individer och deras miljö i relation till fördelningen av icke-dödliga skador hos barn och unga. Avhandling hade två specifika syften. Det första var att undersöka sambandet mellan lokala sociokulturella förhållanden och icke-dödliga skador hos barn och unga och den andra att utforska hur barn och unga upplever och uppfattar skador och skaderisker.

Metoder: Det här avhandlingsarbetet baseras på studier från Skaraborg, som är en del av Västra Götalandsregionen. Avhandlingen inkluderar två kvantitativa och två kvalitativa studier. Ett omfattande hälso- och sjukvårdsregister användes för att beräkna genomsnittlig årlig andel av icke-dödliga skador totalt och uppdelat på kön och åldersgrupper (2000-2005) för de kvantitativa studierna. De lokala sociokulturella strukturerna studerades genom olika indikatorer. Den lokala alkoholmiljön studerades genom indikatorer som mätte tillgång till alkohol, konsumtion av alkohol och alkoholrelaterade brott. De lokala socioekonomiska och genusstrukturerna studerades genom 'relativ fattigdom', 'relativt välstånd i kombination med en dominans av män bland företagsledarna i kommunen', 'relativt jämn fördelning av kvinnor och män i okvalificerade arbeten i kommunen och i politiska uppdrag' och 'relativt spridning i inkomstfördelningen'. Pearson korrelationskoefficienter användes för att mäta linjära samband mellan dessa kombinationer och skadeförekomst. Kvalitativa data samlades in genom intervjuer. Intervjuer med barn gjordes i sex grupper indelade efter kön och ålder (9, 13 och 17 år). Critical Incident tekniken användes för att intervjua unga vuxna. Innehållsanalys användes för att analysera både barn och unga vuxnas upplevelser och uppfattningar om skador och skaderisksituationer.

Resultat: Det fanns positivt samband mellan alkoholtillgång och alkoholkonsumtion i kommuner och skador bland pojkar i åldern 6-17 år. Ett negativt samband observerades mellan alkoholkonsumtion och frakturer bland flickor i åldrarna 6-17 år. Ingen av de tre alkoholindikatorerna var förknippade med skador bland unga vuxna. I kommuner med små könsskillnader i andelen kvinnor och män i yrken utan krav på utbildning i kombination med små könsskillnader i andelen kvinnor och män i politiken fanns det samband med skador bland både pojkar och flickor i åldrarna 6-17 år. Det var få skador bland pojkar i kommuner med en relativt vid inkomstfördelning. Det fanns inga samband mellan graden av fattigdom och skador hos barn. I de kvalitativa intervjuerna förklarade barnen sina skador med hjälp av både person och situation och vissa skador uppfattades som "oförklarliga". Barn verkade ha ett brett perspektiv på skadornas svårighetsgrad och inkluderade också psykologiska och sociala konsekvenser av en skada i sin bedömning. Tre huvudkategorier kännetecknade unga vuxnas erfarenheter av situationer då de var nära att skada sig: utföra något under press, närkontakt med mer eller mindre oönskade faktorer i miljön, och medan man försökte lära sig något. Fem olika kategorier sammanfattade unga vuxnas sätt att hantera situationer då de nästan skadade sig: att fly, att släppa kontrollen, att konfrontera risken, att ropa på hjälp, och att inte göra någonting.

Slutsats: I denna utforskande avhandling tyder resultaten på att såväl sociokulturella faktorer som barn och ungas erfarenheter kan ge viktig kunskap om icke-dödliga skador hos barn och unga. Resultaten visade samband mellan socioekonomiska och genusstrukturer och den lokala förekomsten och fördelningen av icke-dödliga skador hos barn och unga. Styrkan i sambanden varierade med kön, ålder, typ av skada, och typ av sociokulturella faktorer. Barn verkar, enligt studierna i den här avhandlingen, att ha ett helhetsperspektiv på skadornas svårighetsgrad vilket kan vara viktig information för vårdpersonal i mötet med skadade barn och unga. Unga vuxna utsätts ofta för nya situationer som de inte tidigare befunnit sig i vilket kan öka risken för skador. Deras brist på erfarenhet kan också påverka deras subjektiva tolkning av situationen. Resultaten i denna avhandling visade nya perspektiv vilka kan ses som utgångspunkter för framtida forskning och utveckling av lokala skadeförebyggande program.

INJURIES – A MAJOR PUBLIC HEALTH PROBLEM IN YOUNG PEOPLE

Injuries are one of the leading causes of premature death and permanent disability in our societies, and they account for 12% of the total global disease burden¹. Worldwide, more than 40% of all fatal injuries are in young people aged 10–24 years². In a single year (2004) in the European region 42,000 people aged 19 years or younger died due to unintentional injuries³. In addition to the registered fatal injuries, there were 5.4 million hospital admissions and 68.7 million attendances at hospital emergency rooms³. This shows that injuries are one of the major health threats for adolescents and young adults.

Injuries contribute to a large proportion of the burden on health services. The average direct medical costs of nonfatal injuries treated at hospital level in a single year in Europe (1999) were €19 per child aged 0–14 years and €28 per person aged 15–24 years⁴. These figures represent both fatal and severe injuries, but the number of young people seeking help outside hospitals or treating themselves is unknown.

Childhood injuries are unevenly distributed not only between ages but also between genders⁵. Figure 1, which illustrates the distribution of injuries registered in Swedish hospitals from 2000 to 2005, shows that attendance at hospital due to an injury increases with age in both genders, and that the gender gap in injuries in Swedish children increases after the age of 10. Although Sweden has a high level of gender equity, differences in injuries between boys and girls show that boys are at a substantial disadvantage.

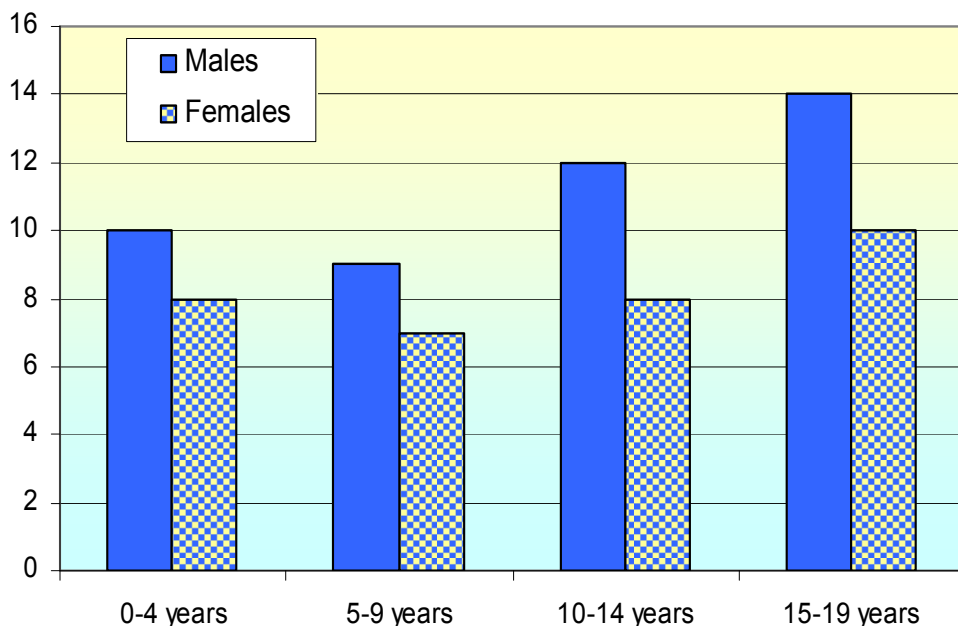


Figure 1. Mean annual number of patients coded with an injury or poisoning per 1000 inhabitants by age and gender (2000-2005). Swedish Injury Data Base, Socialstyrelsen.

Among the adult population (18–64 years), young adults (18–29 years) are overrepresented in injury casualties. For example, motor vehicle injuries show a peak in young adults and then decrease with age until the age of 70^{7 8}. Young workers suffer more nonfatal occupational injuries than older workers⁹. Recent studies have suggested that contemporary young adults in industrialised countries have social benefits that allow them considerable freedom and the opportunity to explore different occupations¹⁰⁻¹². This in turn means that young adulthood entails many encounters with unfamiliar environments, new conditions, and hence, increased exposure to injury-risk situations^{7-9 13-15}. Nevertheless, rather few studies have focused specifically on injuries among young adults. Sometimes they are studied together with adolescents and sometimes together with older adults¹⁶ making it difficult for public health planners to develop injury prevention programmes for this specific age group.

Children's injuries are usually explained from the parents' point of view and very seldom from the child's point of view. Researchers from various disciplines have reported that school-age children can provide better information about their experiences than their parents since they spend much of their time without parental supervision¹⁷⁻¹⁹. Despite children's reliability regarding their own experiences, qualitative studies exploring children's experiences and perceptions of injuries are limited^{17 18 20-23}.

THEORETICAL APPROACH

Injury, like health, is not merely a product of individual (biological, psychological, and behavioural) factors; injuries result from the sum of social conditions created by interactions between people and their physical and social environments²⁴⁻²⁷. In this section three different ecological theoretical models will be presented. Ecological models are those that take into account the physical environment and its relationship to people at individual, interpersonal, organizational, and community levels²⁸⁻³⁰. The first two models have been used in the analysis of injuries for more than 20 years²⁴⁻²⁶. The third ecological model has been widely used in sociology to understand the influence of family and other contextual factors in the health and development of children²⁸.

The epidemiological triad

Prior to the 1950s injuries were considered to be the products of accidents, unpredictable incidents due mainly to bad luck²⁴. John E. Gordon was the first scholar to conceptualise injuries as an ecological problem best understood as interplay between at least three entities: the host, the agent, and the environment²⁴. Gordon proposed that injuries result from the transfer of kinetic, chemical, or thermal energy (the agent) to a person (the host),²⁴ and that a vector (person or animal) or a vehicle (inanimate object, such as a motor vehicle or a machine) was essential for the transfer of the energy to the person. Gordon also recognized that not only elements of the physical environment (sun, rain, snow, stones) and elements of the biological environment (animals, plants) but also elements of the social environment (other people) were involved in the transfer of energy that caused injuries²⁴ (See Figure 2).

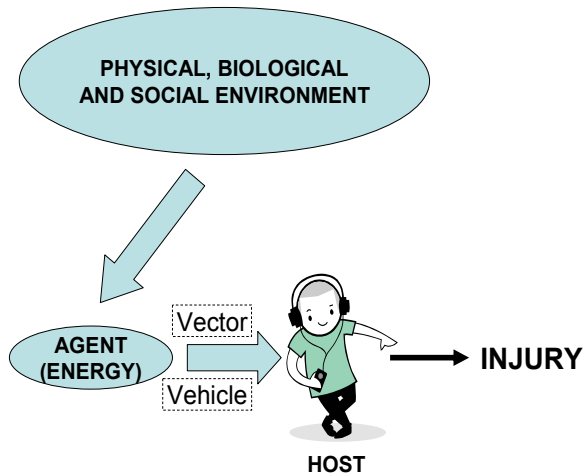


Figure 2. Gordon’s application of the epidemiological triad in the eco-analysis of injuries

Haddon’s matrix

In 1980, William Haddon expanded Gordon’s ecological analysis of injuries by combining the components of the epidemiological triad (host, agent, and environment) with three levels of injury prevention^{25 26}. Haddon’s analytical risk assessment model is also known as Haddon’s matrix (see Table 1). The identification of factors involved prior to the event support the development of strategies to reduce people’s exposure to injury-risk situations (primary prevention); the identification of factors that interplay during the event is useful for the development of strategies to reduce the impact of injuries in a particular injury situation (secondary prevention); and the study of factors involved after the event helps our understanding of how to reduce the consequences of the injury (tertiary prevention).

Table 1. William Haddon’s analytical risk assessment of injuries

	HOST	AGENT	ENVIRONMENT
PRE-EVENT	Conditions <u>before</u> the injury situation		
EVENT	Conditions <u>during</u> the injury situation		
POST-EVENT	Conditions <u>after</u> the injury situation		

The ecosystem theory

At the same time as William Haddon published his matrix, Urie Bronfenbrenner presented his sociological approach to study the role of sociocultural structures in child development²⁸ (see Figure 3). Bronfenbrenner suggested that child development was the result of an interplay between intrapersonal factors (age, sex, race, health, personality), factors from the micro-system (attitudes and behaviours of family, peers, and teachers), the interaction between the child's micro-system and the meso-system (institutional elements such as school, church, and leisure activities) and factors from the exo- and macro-level systems (e.g. socioeconomic and gender structures, laws, and governmental policies).

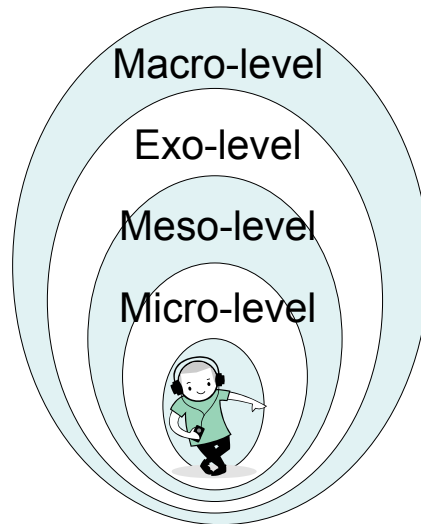


Figure 3. Urie Bronfenbrenner's ecosystem theory

In line with Bronfenbrenner's ecosystem theory, a group of scholars in the 1990's resurrected the holistic idea that contexts matter to individual health³¹. Growing evidence shows that local characteristics of the sociocultural structure shape people's opportunities, preferences, behaviours, and health statuses³¹⁻³⁹. Studies show that the local sociocultural structures directly influence the psychological and physiological processes of individuals in the population, thus influencing their health^{32 36 40}. Earlier studies have also found an indirect influence of the local sociocultural structures over the health of children through influencing the sociocultural conditions of the children's immediate environment (family, peers, and teachers)^{26 31 33 37 38 41 42}. Additionally, multilevel studies have shown that local sociocultural characteristics have effects independent of individual characteristics in the occurrence of injuries⁴³. Thus, an ecological approach to injuries in children and youth seems relevant, taking all three models into consideration. An injury can be an event at the individual level only, but more often it involves the interplay of different factors in different levels of the environment. This thesis begins with a theoretical understanding of the individual as an agent in continuous dynamic interaction with various levels of the environment.

Factors associated with injuries in young people

Injuries are complex phenomena that result from the interplay of the conditions of the person (children and young adults), the conditions of their immediate environment (family, peers, and neighbourhood), the conditions of their local institutions (school, work, clubs, bars, transportation system, health services), and the physical, biological, and social conditions of their neighbourhoods and municipalities. This section presents a review of the individual and environmental factors associated with injuries in children and young adults.

Psychological conditions

Psychological conditions have been suggested as individual factors that could be injury determinants. Depression, anxiety, conduct disorders, and hyperactivity have been associated with injuries, especially self-inflicted injuries⁴⁴⁻⁵⁰. Thus, certain psychopathologies and limitations of intellectual development can place children at specific danger through their lack of knowledge and experience. Some researchers have also pointed out that other psychological conditions, such as sensation-seeking, can be associated with risk-taking behaviours and with injuries²³. Studies show that children and adults with risk-taking behaviours, compared with the general population, generally underestimate their vulnerability, have less fear of serious consequences, and perceive more personal control in risky situations⁵¹⁻⁵⁵. A Canadian study found that boys' risk avoidance was associated with their perceived vulnerability to severe injury, whereas girls' avoidance was associated with perceived vulnerability to any kind of injury⁵⁶. Studies exploring injury experiences in children and in adults have found that recurrent injuries or a history of severe injuries were predictive of future injury episodes^{21 57 58}. In line with this, Johnson et al.⁵⁹ suggested that people's engagement in risk-taking behaviours was associated with their incomplete appreciation of their level of risk. How children and young adults experience and perceive injury-risk situations is a field seldom studied and more knowledge is needed to continue our work to prevent injury.

Developmental status

Developmental status is another factor that has been associated with young people's injuries. A frequent explanation of adolescents' high injury rates is that they experience large and rapid biological, psychological, and sociological changes⁶⁰ that, for example, can affect their coordination as they adapt to a quickly growing body. Adolescents may appear to be adults while they are psychologically still children. As children grow up, parental supervision decreases and contacts with other people (peers, teachers, and coaches) and new environmental conditions increase. Some researchers have also suggested that because of contextual conditions, "adolescence" can be considered to extend up to the age of 30 in industrial countries¹⁰⁻¹². For example, a large number of young adults in industrial countries are able to postpone adult responsibilities, while enjoying considerable freedom and the opportunity to explore different occupations¹⁰⁻¹². In times of economic uncertainty, however, as in recent years, the unemployment rate in young adults is twice as high as in the rest of adult population. This condition can lead to both intentional and unintentional injuries. Young adults do not suffer as many biological changes as adolescents do, but they have to confront new challenges arising from their inclusion in the labour market, their independence from their parents, and their abilities to buy alcohol and to drive a car unchaperoned.

Alcohol environment

Alcohol consumption is a well-known risk factor for injuries in both adults^{61 62} and adolescents⁶³. In spite of legal limitations in Sweden, 81% of adolescents have tried alcohol before the age of 17 years⁶⁴. The attitudes and behaviours of people close to adolescents, such as parents, older siblings, and peers, towards alcohol have been associated with adolescents' own alcohol consumption and alcohol abuse⁶⁵⁻⁷¹. Foley et al.⁷² found a strong positive association between adults' positive attitudes towards alcohol use and adolescents' alcohol consumption and abuse. Certain conditions of the local alcohol environment, such as high per capita alcohol consumption and detrimental societal drinking patterns, are associated with fatal and severe injuries in the adult population⁷³⁻⁷⁶, and studies in college students have found that easy local access to alcohol was associated with severe and fatal injuries in young adults aged 18–24 years^{77 78}. Studies from the US and Australia have shown that easy local access to alcohol is associated with adolescents' alcohol consumption^{65 79 80}, and studies from California have found that easy purchase of alcohol was associated with violence-related injuries in children^{65 79-82}. Gruenewald⁴² claimed that the negative consequences of a permissive local alcohol environment affect not only drinkers but also non-drinkers. For example, it has been found that driving while intoxicated (DWI) is associated with traffic injuries in children who are passengers, pedestrians, or cyclists^{83 84}. Sweden fairly recently had one of the most restrictive alcohol policies in the Western world with a state-owned alcohol retail monopoly, high alcohol taxes, and very strict laws concerning DWI^{85 86}. Nevertheless, alcohol was implicated in 25% of deaths in people up to 50 years old, and about 10% of lost person-years of life in Sweden from 1992 to 1996⁸⁷. Sweden's membership in the European Union (1995) contributed to a more liberal alcohol policy with easier access to alcohol and higher per capita alcohol consumption^{85 88}. For example, the average per capita alcohol consumption in Sweden increased from eight litres in 1996 to ten litres in 2002⁸⁹. Alcohol is a good example of how different ecological systems (individual, immediate, and contextual) can interact to influence adolescents' attitudes and behaviours. Whether and how the alcohol environment in Sweden influences the risk of injuries among young people is still unclear, however, due to the lack of scientific studies.

Socioeconomic structure

Another well-known risk factor for childhood injuries is socioeconomic deprivation or low income^{8 90-93}. Recently it was found that low socioeconomic status (measured by parental income, parental education, household social class, or father's social class) was associated with fatal and severe childhood injuries⁹². Area-level studies have shown positive associations between poverty and fatal childhood injuries^{92 94-99}, although the findings are inconclusive for nonfatal injuries^{43 100}. Furthermore, area-level poverty has been shown to effect childhood injuries independent of individual-level poverty^{93 101-103}. In spite of the fact that Sweden is one of the most egalitarian countries in the world, the occurrence of childhood injuries in Sweden has an unequal socioeconomic distribution^{8 90 91}. For example, a multilevel study found that children living in the most deprived neighbourhoods had odds 1.13 times higher (95% CI: 1.1–1.2) of being injured than children in the most affluent neighbourhoods after adjustment for sex, household income, parental education, and immigrant background¹⁰³. Apart from poverty or deprivation, another socioeconomic factor shown in the last decade to play an important role in mortality rates, including children's mortality, is the unequal distribution of income at area level¹⁰⁴. More egalitarian local distribution of income is associated with lower rates of both child mortality and violence-related mortality¹⁰⁵. National Swedish data showed that while household income increased by an average of 25% between 1995 and 2004, the income gap between people with low versus high incomes widened¹⁰⁶. Socioeconomic conditions at individual, family, and local levels are another example of the importance of

using an ecosystem model in the analysis of health problems. Whether and how the widening gap in income distribution influences the risk of injuries among young people in an egalitarian country like Sweden is still unclear.

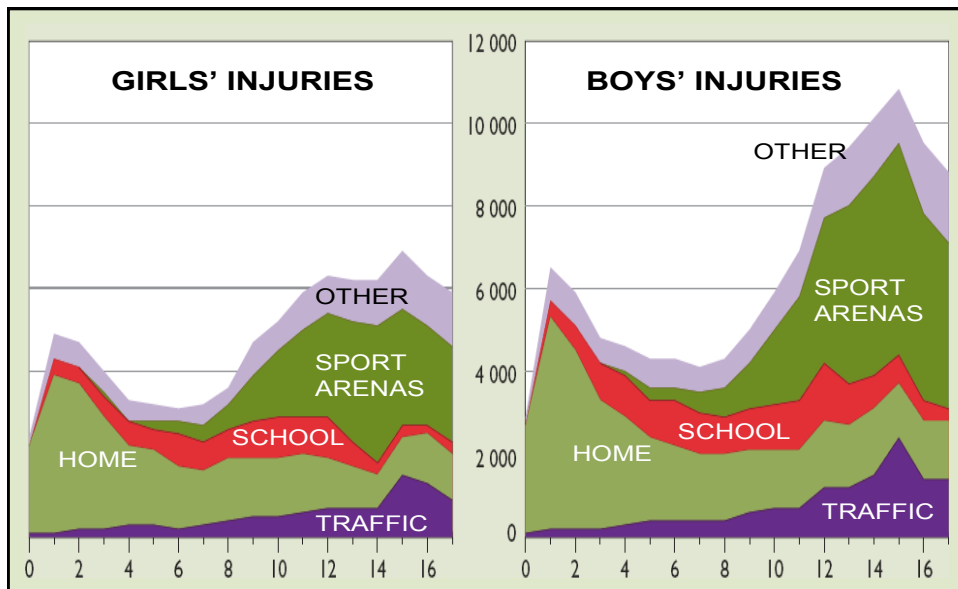


Figure 4. Mean annual number of injuries attended in a sample of emergency rooms, by age and gender (Sweden 2005–2007). Swedish Injury Data Base, Socialstyrelsen.

Gender structure

Death certificates and hospital data shows that boys' injuries are overrepresented. For example, Figure 4 illustrates the distribution of nonfatal injuries registered at Swedish hospitals. The graph shows gender differences in mean annual numbers as well as in places where the injury situations occurred. It shows that large amount of injuries in adolescents, especially in boys, are sports- or traffic-related.

Internationally, the Swedish gender structure is associated with gender equality. In Sweden, 76% of women and 81% of men work full time or part time¹⁰⁷. However, women also contribute an average of 28 hours weekly of unpaid work to family and household responsibilities, while men contribute an average of 20 hours per week¹⁰⁷. Moreover, the current Swedish occupational system still has vertical and horizontal gender segregations¹⁰⁸. National data from Statistics Sweden (SCB) show that managerial and supervisory positions are still dominated by men, while subordinate positions are dominated by women (vertical gender segregation)¹⁰⁷. Further, in subordinate working positions, men dominate in construction and technology, while women dominate in secretarial and care positions (horizontal gender segregation)¹⁰⁷. SCB data also show that the proportion of women participating in Swedish municipal councils (between 25 and 45 members) in the year 2010 ranged between 29% and 58%¹⁰⁹. Experts in gender theory^{37 38 110} have suggested that the gender structure in the society influences the expected social practices of boys and girls.

Children, young adults, and the people who are important to them, especially family and peers, are influenced by the social expectations of the dominant local gender structure^{37 38 110}. Such gendered practices are, of course, also intertwined with children's biological and developmental phases. The variation of local gender structures in Sweden gives us the opportunity to study whether the local gender structure is associated with the statistical overrepresentation of boys' injuries. It would be interesting to find out whether the number and distribution of childhood injuries will change when more women attain managerial positions in the labour market or more women are involved in political decisions? And what might happen to rates of childhood injuries when more men are more involved in unpaid work at home or take more parental leave to spend more time with their small children?

A summary of the points of departure for the thesis

Individual, institutional, and contextual factors have been shown to be involved in young people's injuries. Qualitative studies exploring children's and young adults' experiences and perceptions of injuries are needed to complement the knowledge gained from quantitative studies. Statistically, adolescents and young adults, especially boys, dominate fatal and severe nonfatal injuries. However, more knowledge is needed to understand the reasons behind differences in rates and types of injury between genders and age groups. Studies show that not only biological and psychological factors but also sociocultural factors are involved in the distribution of childhood injuries^{27 111}. As pointed out by Bronfenbrenner²⁸ and other scholars³¹⁻³⁹, the context or macro-level system shapes people's opportunities, preferences, behaviours, and health status. Because the aspects of the socioeconomic structure (especially local socioeconomic deprivation) is generally associated with childhood injuries, more efforts are needed to understand whether and how other aspects of the socioeconomic structure, such as wealth and income distribution, may be related to childhood injuries. No previous studies have explored the association between the local alcohol environment and childhood injuries in Sweden. Because the Swedish alcohol environment is changing, it is important to explore whether and how it may be associated with childhood injuries. Gender structure may also be an important factor in gender differences in childhood injuries, thus knowledge is needed to understand whether and how gender structure may be associated with injuries in young people. Finally, because much of the previous research is based on fatal or severe injuries, more studies of less severe nonfatal injuries are needed to better understand how to prevent all kind of injuries in young people.

AIM AND SPECIFIC RESEARCH QUESTIONS

The overall aim of this thesis was to try to understand the relationship between the continuous interplay of individuals and their environment with the distribution of nonfatal injuries in young people. Further, this thesis had two specific aims. The first aim explored whether the distribution of nonfatal injuries in young people was associated with particular local sociocultural conditions, and the second explored how children and young adults perceive and experience injuries.

The following specific research questions were addressed:

- Is the local alcohol environment associated with nonfatal injuries in children and young adults? (*Paper I*)
- Are the local socioeconomic and gender structures associated with nonfatal injuries in children? (*Paper II*)
- Do the associations between the studied sociocultural conditions and nonfatal injuries differ by age group and gender? (*Papers I & II*)
- How children experience, perceive, and explain injuries? (*Paper III*)
- How do young adults experience and manage injury-risk situations? (*Paper IV*)

METHODS AND MATERIALS

Design

This thesis studied nonfatal injuries in young people using analyses on two levels. Analyses on the contextual level (macro-system) were used to study whether the local sociocultural structures were associated with the distribution of injuries in young people, and analyses on an individual level (intrapersonal system) were used to study young people's experiences and perceptions of injuries and injury-risk situations (see Figure 5). Two of the studies analysed aggregated data at the area level (*Papers I & II*) and the other two studies analysed qualitative data about lived experiences of injuries (*Papers III & IV*). The quantitative studies used data collected online from SCB, the Swedish National Institute of Public Health (FHI), and the Swedish National Council for Crime Prevention (BRA). The annual number of nonfatal injuries by age, gender, and municipality (2000–2005) used in the quantitative studies was obtained from the Skaraborg Local Injury Surveillance System (SLISS). The qualitative data from children were collected through individual interviews in small groups of children stratified by age and gender (*Paper III*). Face-to-face interviews, using the critical incident technique (CIT), were used to collect the qualitative data from young adults for *Paper IV*.

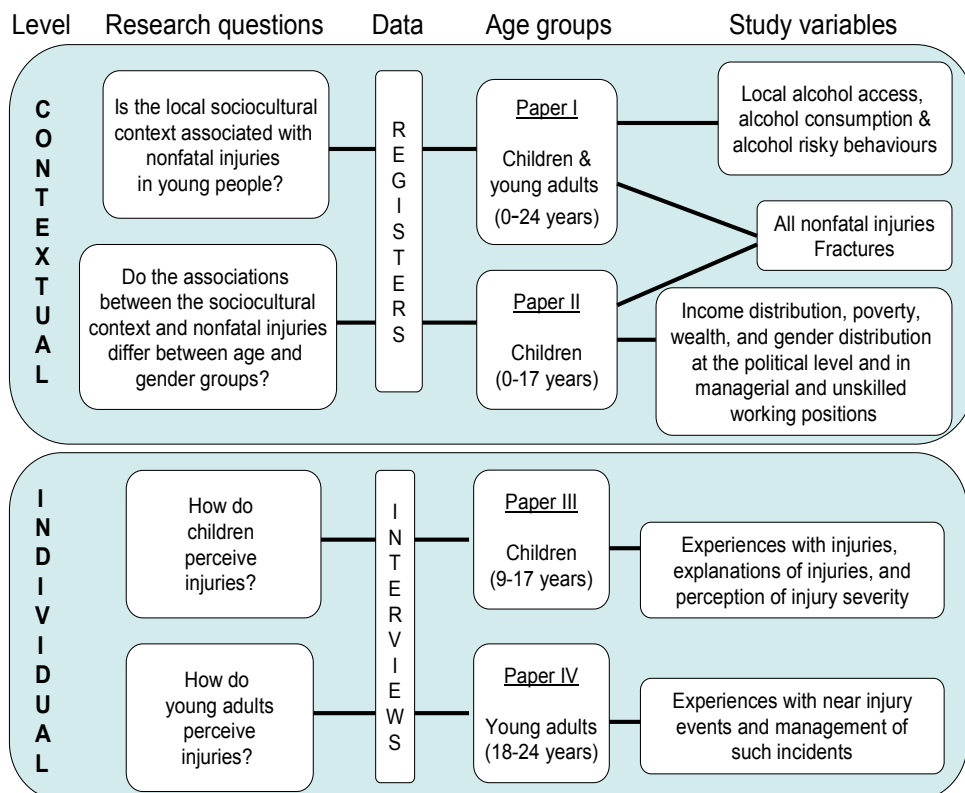


Figure 5. Summary of the material used in the included studies.

Study population

The study took place in the Skaraborg region, in the southwest of Sweden. It is an agricultural and manufacturing area, with 40% arable land compared with 8% in Sweden as a whole (see Figure 6). The Skaraborg region is politically and administratively divided into 15 municipalities. The average annual population (2000–2005) in these municipalities ranged from 6,000 to 50,000 inhabitants (N = 256,000 inhabitants), 30% of whom were 24 years old or younger (n = 74,500 inhabitants).

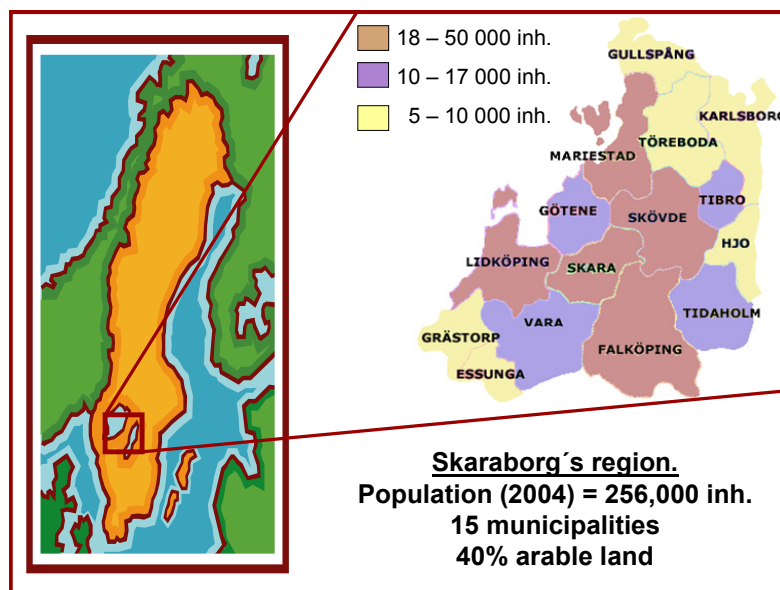


Figure 6. Geographical and demographical distribution of the studied population. Population living in municipalities located in the region of Skaraborg, Sweden.

Injury prevention in Skaraborg

The Swedish region of Skaraborg has a particular history regarding injury prevention^{112 113}. More than forty years ago, data from the health services in the Skaraborg region were linked to demographic data to establish the health status of the population and to develop a regional health plan. This intervention attracted the attention of researchers, and in the 1970s a group of researchers started the injury prevention work in Skaraborg. The researchers focused on the municipality of Falköping and developed a community-based approach to injury prevention. Injury data began to be systematically collected in Falköping in 1978¹¹⁴. Later, the model was tested comparing Falköping with a neighbouring municipality (Lidköping)¹¹⁵⁻¹¹⁸. The Falköping model was then adopted by the World Health Organization (WHO) for its Safe Community programme^{119 120}. In 1984, the Primary Health Care Committee in Lidköping organized their injury prevention programme based on the Falköping Model. Five years later, Lidköping was declared by WHO to be the first “Safe Community” worldwide¹²¹. This motivated the creation of the Skaraborg Regional Accident Programme in 1992 and the creation of the Skaraborg Local Injury Surveillance System (SLISS). SLISS started as a pilot project in 1998, and since the year 2000 injury data has been collected systematically by all the local health services located in Skaraborg¹¹³.

Data collection

The quantitative data used to study the associations between sociocultural structures and the occurrence of nonfatal injuries (*Papers I & II*) were obtained from data systematically registered in SCB, FHI, the Swedish National Council for Crime Prevention (BRA), and SLISS. The qualitative data used to study how children and young adults experience, explain, and manage injury-risk situations (*Papers III & IV*) were obtained from individual interviews with children aged 9, 13, and 17 years, and with young adults aged 18–24 years.

Contextual data (Papers I & II)

Earlier studies analysing health inequalities have discussed the importance of the selection of variables and methods^{122, 123}. Cummins et al.¹²³ suggested that contextual studies should begin by conceptualising the contextual determinants that could affect the outcome variable (nonfatal injuries in this thesis). Accordingly, three sociocultural structures were selected and after their potential association with nonfatal injuries in children and young adults was estimated, they were theoretically defined as socioeconomic structure, gender structure, and alcohol environment (see Table 2).

Table 2. Theoretical definition and selected indicators of the studied contextual structures

Structure	Theoretical definition	Municipal Indicators
Socioeconomic structure	Socioeconomic structure was defined as the level of relative income and its distribution in the population.	Gini coefficient index Mean income % with income or assets ≥1,000,000 SEK % children living in a household receiving social welfare % unemployed adults % adults with < 9 years of education
Gender structure	Gender structure was defined as the distribution of roles between men and women at home, at work, and in the political arena.	% women on municipal council Sex ratio in managerial positions Sex ratio in unskilled working positions
Alcohol environment	Alcohol environment was defined as the dominant societal attitudes and practices regarding alcohol consumption and related behaviours.	Number of restaurants and bars licensed to serve alcohol per 10,000 inhabitants Litres of 100% alcohol sold in the alcohol retail monopoly per 10,000 inhabitants Annual rates of driving while intoxicated on alcohol per 10,000 inhabitants Annual rates of crimes against alcohol laws (related to illegal production, sale, and consumption of alcohol) per 10,000 inhabitants

Several databases and multiple indicators were strategically identified and analysed to obtain a better understanding of the contextual structures in study, as recommended by Cubbin and Smith⁴³. To obtain a better categorization of the local socioeconomic structure indicators of socioeconomic deprivation, affluence, and income inequality (Gini coefficient index) were identified. There are very few established gender structure indicators, so in order to improve classification of gender structures, indicators of gender roles and participation in the public

and private spheres were identified and analysed. One relevant indicator was the Swedish index used to measure gender equality at the municipality level (JämIndex)¹²⁴. This index combines 15 different variables that measure gender differences in socioeconomic status (income, level of education, employment, and occupation), political participation, and health and sickness (based on work absences due to illness). The JämIndex was excluded from the analysis because it includes measurements work absences due to illness, only some of which are probably due to injuries. Similarly, to better study the local alcohol environment, indicators of access to alcohol, alcohol consumption, and behaviours associated with alcohol were identified and searched for on several databases that systematically aggregate information at the municipality level. This exhaustive search allowed us to find most of the identified indicators. The contextual data included in the quantitative analyses were obtained from databases available online by SCB, FHI and BRA.

Quantitative injury data (Papers I & II)

The injury data collected in SLISS covered four public hospitals and 25 primary health care centres (PHCs). Each of the 15 municipalities located in Skaraborg has at least one PHC (see Figure 7).

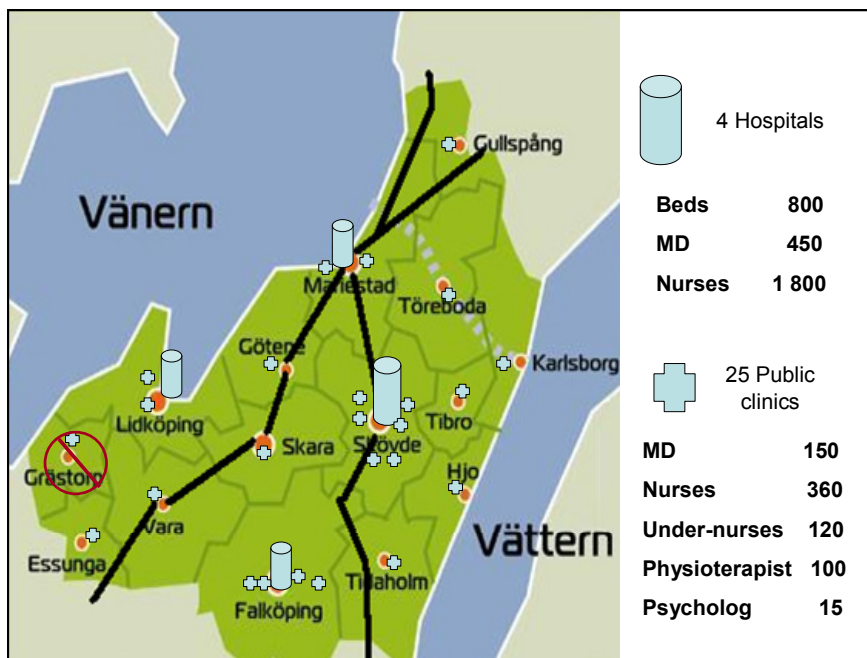


Figure 7. Geographical distribution of hospitals and primary health care centres in the region of Skaraborg, 2004.

In SLISS, as in *Papers I & II*, an injury case was defined as a visit to any public health service unit within any of the included municipalities for medical attention after a traumatic incident¹¹³. Injuries were coded according to the classification system of the European Home and Leisure Accident Surveillance System and the ICD-10 (Chapter XX)¹¹³. Each newly registered injury episode was considered a single case. Dental fractures and cases registered as ‘no injury found’ by the physician were excluded.

Information regarding determinants and consequences of each injury episode was collected from the clinical record completed by the treating physician and on a self-administered questionnaire collecting demographic data and information about the event (see Figure 8)¹¹³.

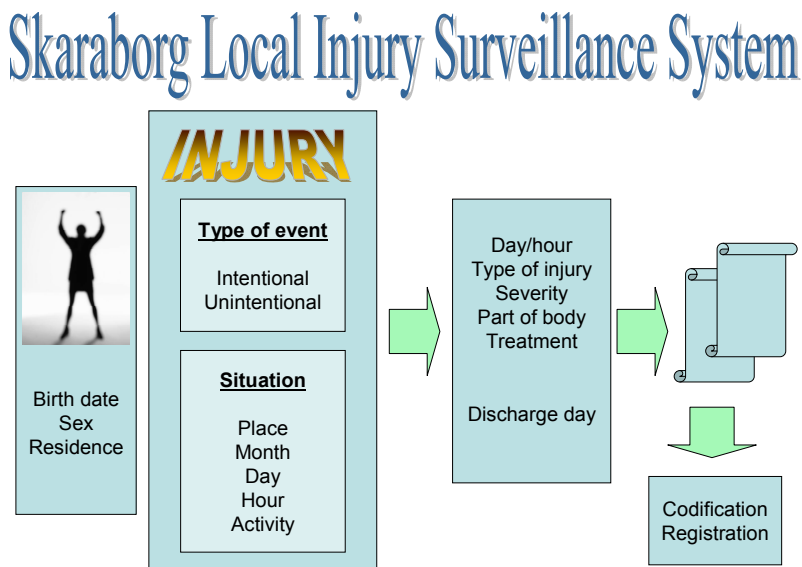


Figure 8. Available information systematically registered in the Skaraborg Local Injury Surveillance System, SLISS¹¹³.

In *Papers I & II*, the nonfatal injuries registered in SLISS were considered to reflect the general health services rendered due to nonfatal injury. Minor injuries can be treated outside the health system, and no evaluation of home or informal treatment has been carried out, and fractures, because they are less affected by dropouts and under-registration, were analysed separately¹²⁵. All fractures were treated at hospitals within the studied area.

Children's perceptions (Paper III)

Individual interviews focusing on one child at a time in small groups were considered the most suitable method of obtaining the children's perceptions and explanations of their lived experiences of injuries. Previous studies have reported that this method may provide a friendly environment in which to interview children, since the presence of other children helps to reduce the power inequality that may occur between adults and children during one-on-one interviews^{17,18}. The method was tested in a pilot study with 10-year-old children and the results were satisfactory and promising. The children in the pilot study were able to describe their experiences spontaneously and share their perceptions of their injuries. The pilot study also revealed that mixed-gender groups could influence the group dynamic and the results, as children strived for peer approval or status within the group. Gender and developmental differences were therefore taken into account and individual interviews were conducted in small homogeneous groups of 3–8 children stratified by age and gender. Six sessions were planned, one for each gender in each of three age groups (9, 13, and 17 years). The pilot interviews were not included in the data analyses.

A strategic sample of participants was recruited from six municipalities from Skaraborg with different levels of urbanization to ensure a broad selection and variation of experiences. Written information was sent to a random sample of school boards, and after verbal permission from the school board was obtained to conduct the study, a list of pupils, including their telephone numbers and mailing addresses, was requested. Written information was sent to a random sample of 48 pupils from the list representing three educational levels (grades 3, 7, and 11) and six different schools. The selected grades correspond to ages 9, 13, and 17, respectively. Parents and children were then contacted by telephone and the children invited to participate in the study.

Twenty-nine children chose to participate. The smallest group had three participants (boys 17 years) and the largest group had seven (girls 17 years). Lack of parental interest was the main reason for declining participation in the group of children aged 9. Lack of interest on the part of the child was the main reason for declining participation in the older two age groups. Children were reminded at all stages that their participation was voluntary and that they could discontinue the interview at any time. Written and verbal consent was obtained from parents and children. All the interviews were conducted by an experienced and fully qualified child psychologist in a friendly and confidential atmosphere in a room in the children's school; the author of this thesis acted as an observer. After a short introduction of the study objectives, the interviewees were asked to introduce themselves (name, age, family composition, area of residence, and hobbies). Participants were asked individually to describe what they considered a minor physical injury and what they considered a severe physical injury? They were then each asked to describe their most common injuries, their most recent injury, and finally, their worst experience of injury. One by one the participants were invited to answer each of the open questions; follow-up questions were asked to stimulate greater descriptive detail (what, when, where, with whom, and how did it happen?) and to elicit how the children explained the situation. The sessions lasted between 60 and 90 minutes. Each session was audio-recorded with verbal permission of the participants. All the interviews were collected between November 2008 and June 2009.

Young adults' perceptions (Paper IV)

We considered CIT the most suitable method of data collection to study young adults' experiences of injury risk situations. CIT is a systematic, inductive, and highly flexible qualitative research method for collecting critical or significant lived experiences¹²⁶⁻¹³¹. CIT was developed by Flanagan¹²⁶ and its central concept is the use of critical incidents, particular events of great importance for the person involved, to assist interviewees to recall present and former lived experiences in a clear and detailed way¹³⁰⁻¹³⁴. In a study employing CIT the number of participants is of less interest than the number of critical events reported.

A semi-structured guideline for the individual interviews was developed using one focus group of five young adults (18–24 years) studying at the University of Gothenburg. The CIT and semi-structured guideline were then tested in five pilot interviews with young adults (18–24 years) from different backgrounds and the results were satisfactory and promising. The pilot interviews were not included in the data analyses.

To ensure a broad selection and variation of experiences a strategic sample of participants was recruited from Skaraborg. Three different sources were used: a local register of university students in a semi-urban municipality, a register of employees in a food manufacturing factory in a rural area, and records of injured people attending an emergency room at a local hospital between January 2008 and June 2009. Written information was sent to a random

sample of students and workers and to injured people who had shown interest in participating in the study when they were approached by a nurse in the emergency room. Selected candidates were contacted by phone and a meeting was arranged with those who decided to participate. Reasons for declining to participate were mainly lack of interest or lack of time to attend the meeting. Participation was voluntary and no reimbursement was offered to participants. Of 20 people interviewed, only one man aged 23 years was excluded from the study, because he reported no specific near-injury situation. All the interviews were collected between March 2008 and June 2009.

All the interviews were conducted in a friendly and confidential atmosphere in a room near the young adults' residential or working area. All the interviews were conducted by a professional with broad experience of conducting interviews using the CIT¹³²⁻¹³⁴. After a short introduction of the study objectives, the interviewees were asked the following questions to clarify their understanding of what constituted minor or severe physical injury and to help the interviewees to recall near-injury situations:

- What is a minor physical injury for you?
- What is a severe physical injury for you?
- Can you describe at least two situations, independent of when it happened, in which you experienced a physical injury?

Responses from these introductory questions were not included in this thesis.

The interviewees then asked to describe as many lived experiences of near-injury situations as they could recall. Follow-up questions were asked to stimulate the interviewee to describe the situation in great detail (what, when, where, with whom and how it happened?) and to recall how they managed the situation. Each interview was recorded digitally with permission of the participants.

Data analyses

The data in this thesis were analysed using two different approaches. The quantitative studies (*Papers I & II*) used aggregated data at the municipality level, stratified by age and gender, with municipal annual rates transformed into mean annual rates (2000–2005); Pearson's correlations were used to analyse the linear associations between the sociocultural structures of interest and nonfatal injuries in children and young adults. The qualitative data (*Papers III & IV*) was analysed using manifest content analysis and researcher triangulation.

Age stratification

In this thesis, as in The Convention on the Rights of the Child¹³⁵, every person below the age of 18 years is considered a child. As shown earlier, childhood injuries vary by age^{5,6}, therefore, the child population in the quantitative studies was strategically stratified in three age groups: 0–5 years, 6–12 years, and 13–17 years, and young adults (aged 18–24 years) were analysed separately from the children.

Municipal mean annual rates (Papers I & II)

SLISS provided the absolute number of registered injuries and fractures by municipality, gender, and age group. The specific annual average population was obtained from SCB to calculate the gender- and age-specific annual local injury and fracture rates. Then, the annual rates were transformed into mean annual rates (2000–2005). This procedure was done to obtain more stable values for analyses¹³⁶. The only exception was the proportion of women

participating on municipal councils, which was available only for the year 2002 in the study period.

Principal component analysis (Paper II)

Principal component analysis (PCA) is a mathematical tool used to identify the structure of correlations between variables and can be used to construct indices preserving most of the original information¹³⁷. PCA was used to combine the gender and socioeconomic indicators after some of the selected indicators measuring socioeconomic structure were found to correlate with some of the selected indicators measuring gender structure (see Table 2 in *Paper II*). PCA later confirmed our first impression of the association between socioeconomic structure and gender structure, and it identified four data-driven components (eigenvalue >1), representing 84% of the total variation in the data. The variables with factor component loading scores greater than ± 0.6 were used to label the components. Component 1 was labelled *relative poverty*. Component 2 was labelled *relative wealth and male manager dominance*. Component 3 was labelled *narrow gender ratio in unskilled occupations and in politics*, and Component 4 was labelled *wider income distribution*.

Correlations (Papers I & II)

The strength and direction of the linear associations were analysed using Pearson's correlation coefficient (SPSS version 15.0): "0" means no linear association, and "1" or "-1" means complete linear association between the studied variables. The analyses in this thesis were based on a small sample ($n = 14$), therefore, the level of significance was not considered. Instead, linear correlations of -0.4 to 0.4 and stronger ($r \geq 0.4$ or ≤ -0.4) were acknowledged to indicate moderate correlation between the variables.

Content Analysis (Papers III & IV)

All the qualitative data were transcribed verbatim. The analysis was guided by the manifest content analysis described by Graneheim & Lundman¹³⁸. The transcribed interviews were read several times to allow the researchers to become familiar with the data and to obtain a sense of the whole. The data was organized under the specific research questions or emerging themes that would constitute the unit of analysis of the study. In *Paper III* one theme comprised children's perceptions of minor and severe injuries, and the other theme comprised the descriptions and explanations of their most common, most recent, and worst injury experiences. In *Paper IV* one theme comprised lived experiences of near-injury situations, and the other theme comprised young adults' ways of managing of the lived near-injury situations.

The author and another professional scrutinized each statement line-by-line and meaning units were identified, condensed, and codified. The codes were compared and sorted into tentative subcategories and categories in each theme. Afterward, the findings were discussed with my two thesis supervisors. The analyses moved continuously back and forth between the whole transcribed text and the findings, and the categories were compared and revised until the final classification emerged. Finally, the findings were discussed in open seminars with external researchers. These steps in the analytical process, also called 'researcher triangulation', was performed to improve the understanding and the credibility of the findings^{139 140}.

ETHICAL CONSIDERATIONS

The studies included in this thesis followed the WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects, which safeguards the participants’ rights of autonomy and self-determination¹⁴¹. Prior to any contact with local authorities and participants, the study was approved by the Ethics Committee at the University of Gothenburg, Sweden.

Contextual data

All the quantitative data used in this thesis was anonymous information; no individual person can be identifiable. The indicators of the contextual structures of interest were obtained at an aggregated level. The injury database was managed and analysed without using the patient’s personal identification number.

Participants

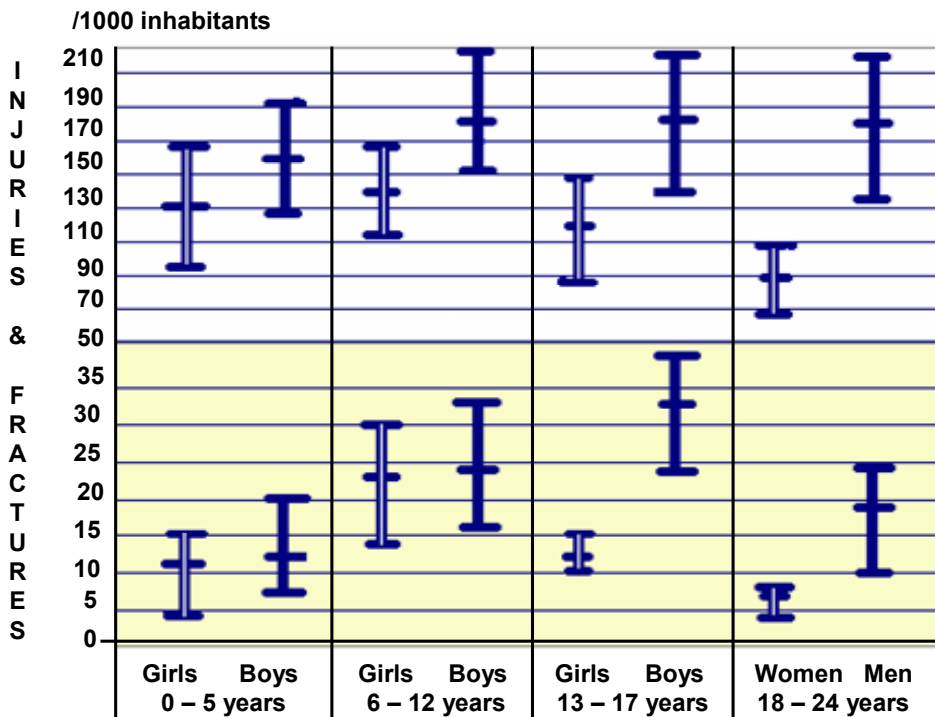
Ethical considerations regarding children’s participation were managed as recommended elsewhere^{20 142}. Each child and its parents, as well as each young adult, were given written and oral information regarding the objectives of the study and what their participation entailed before the interviews were conducted. Written and oral consent was obtained from the children and their parents, and oral consent was obtained from the young adults. It was made clear that participation was voluntary and that participants could withdraw at any time. A psychologist with extensive experience interviewing children conducted the interviews with children and a professional with large experience using CIT conducted the interviews with young adults. Prior to data collection, an emergency plan was prepared with the local health services in case a child or a young adult needed psychological attention or felt uncomfortable while sharing their experiences in the sessions. This plan was made because of the possibility that an injury was intentional and its recall could trigger distress. Permission from the participants was obtained to record the interviews and participants’ personal integrity has been safeguarded during the analysis of the material and writing of the papers and thesis. Details have been deleted from the quotations when necessary to maintain the anonymity of the participants. The records and transcripts of the interviews are kept in a safe cabinet at the Department of Social Medicine, University of Gothenburg, and the data have been used for scientific research only.

RESULTS

Figures 9 and 10 show the age and gender differences in the injury data studied. Figures 11 to 17 summarize the findings from the contextual and individual-level studies included in this thesis. The findings for pre-school children (0–5 years) will be presented first and those for young adults (18–24 years) will close this section.

Distribution of nonfatal injuries in Skaraborg

We found that 44% (n = 11,020) of the annual average number of registered injuries in the 14 studied municipalities during the years 2000 to 2005 were among people aged 24 years or under. Rates of all nonfatal injuries and fractures were higher among males than among females at all ages (see Figure 9). Young adults (18–24 years) had the largest gender differences in injury rates. Males’ injury rates were twice as high for all nonfatal injuries and three times as high for fractures than those of females.



Note: The data includes all registered episodes of nonfatal injuries, excluding cases coded as ‘no injury found’, and all registered fractures, excluding dental fractures. Fracture rates in the grey (lower) zone and injury rates in the light (upper) zone of the diagram.

Figure 9. Age and sex distribution of mean annual injury and fracture rates per 1000 inhabitants within the 14 studied municipalities from Skaraborg, Sweden (2000–2005).

Figure 10 shows the distribution of the registered fractures in SLISS (2000–2005) by age, gender, and place. The youngest age group showed fewest gender differences in the distribution of their fractures. A higher proportion of boys’ fractures than girls’ occurred in day care centres and a higher proportion of girls’ fractures than boys’ occurred inside the house. In the age group 6–12 years, the boys had a higher proportion of fractures at school than the girls. Sport-related fractures were higher in children aged 13–17 years and the boys had a higher proportion of sport-related fractures than the girls. In young adults, the young women had a higher proportion of fractures inside the house than the young men and the young men had a higher proportion of sports-related fractures than the young women. These results supported the decision to perform separate analyses by age and gender in the quantitative studies (*Papers I & II*).

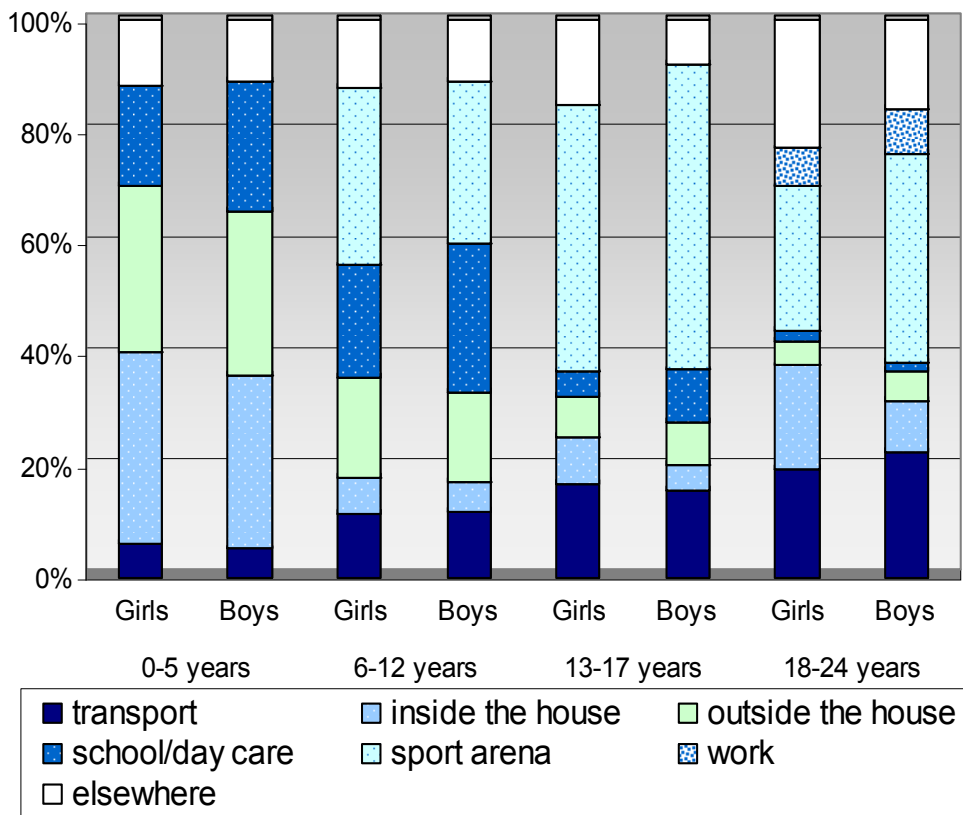


Figure 10. Distribution of the registered fractures by age, sex, and place in Skaraborg, Sweden (2000–2005).

Area-level associations between sociocultural structures and nonfatal injuries in pre-school children (0–5 years).

The area-level analyses in children aged 0–5 years showed that the component “*relative wealth and male manager dominance*” was negatively correlated with both pre-school boys’ and girls’ nonfatal injuries (see Figure 11). Additionally, the component “*wider income distribution*” and the indicators of *local alcohol-related crimes* showed a negative correlation with pre-school boys’ fractures, but no association at all with girls’ nonfatal injuries. Only one positive correlation was observed, and that was between the component “*narrow gender ratio in unskilled working position and in politics*” and fractures in pre-school girls. No strong positive or negative correlations were observed between the component “*relative poverty*” or the indicators of local alcohol access or local alcohol consumption with either pre-school boys or girls’ nonfatal injuries.

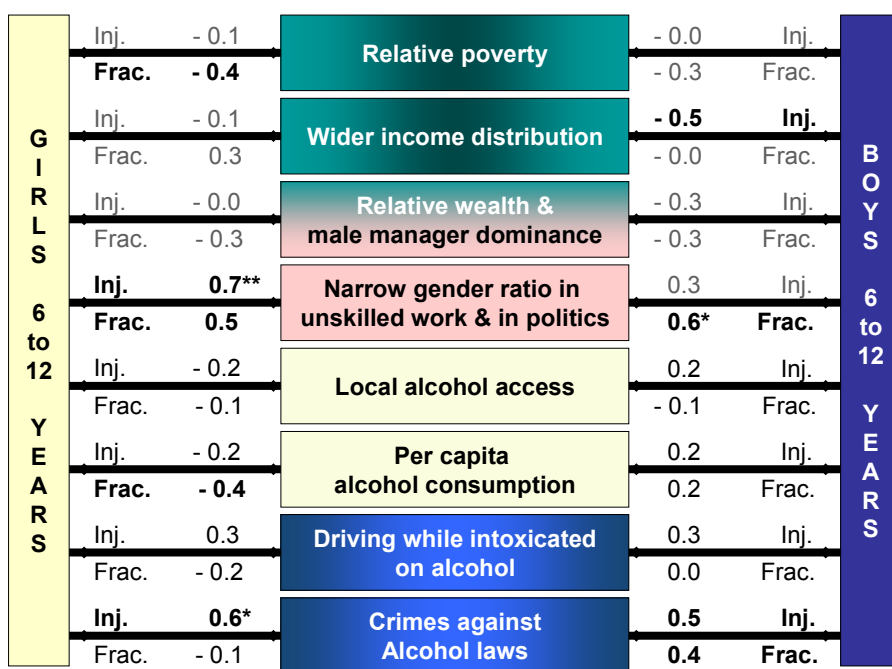
G I R L S 0 t o 5 Y E A R S	Inj.	- 0.1	Relative poverty	- 0.0	Inj.	B O Y S 0 t o 5 Y E A R S
	Frac.	- 0.1		0.0	Frac.	
	Inj.	- 0.3	Wider income distribution	- 0.5	Inj.	
	Frac.	- 0.0		0.2	Frac.	
	Inj.	- 0.3	Relative wealth & male manager dominance	- 0.4	Inj.	
	Frac.	- 0.4		- 0.4	Frac.	
	Inj.	0.2	Narrow gender ratio in unskilled work & in politics	0.1	Inj.	
	Frac.	0.5*		- 0.0	Frac.	
	Inj.	0.1	Local alcohol access	0.3	Inj.	
	Frac.	0.1		0.2	Frac.	
	Inj.	- 0.0	Per capita alcohol consumption	0.2	Inj.	
	Frac.	- 0.3		0.1	Frac.	
	Inj.	- 0.1	Driving while intoxicated on alcohol	0.1	Inj.	
	Frac.	- 0.3		- 0.4	Frac.	
Inj.	0.2	Crimes against Alcohol laws	0.2	Inj.		
Frac.	- 0.1		- 0.4	Frac.		

*= P-value < 0.05
 **= P-value < 0.01

Figure 11. Associations between socio-cultural structures and the occurrence of nonfatal injuries in children aged 0-5 years. Skaraborg, Sweden (2000-2005).

Area level associations between sociocultural structures and the occurrence of nonfatal injuries in school children (6–12 years).

The area level analyses in children aged 6–12 years showed that the component “*relative poverty*” and the indicator *local alcohol consumption* were negatively correlated with primary school girls’ fractures (see Figure 12). The component “*wider income distribution*” was negatively correlated with primary school boys’ injuries. The component “*narrow gender ratio in unskilled working positions and in politics*” and one of the indicators of *local alcohol-related crimes* (crimes against alcohol laws) showed positive correlations with both primary school boys’ and girls’ nonfatal injuries. No strong positive or negative correlations were observed between the component “*relative wealth and male manager dominance*” or the indicators *local alcohol access* and *local rate of driving while intoxicated on alcohol* and either pre-school boys’ or girls’ nonfatal injuries.



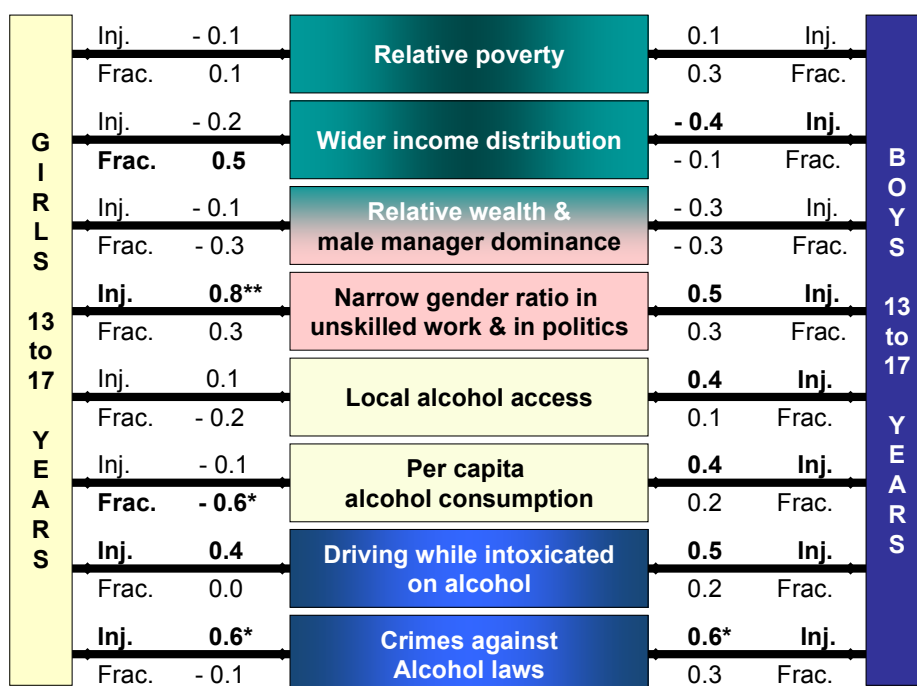
*= P-value < 0.05

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Figure 12. Associations between sociocultural structures and nonfatal injuries in children aged 6–12years in Skaraborg, Sweden (2000–2005).

Area-level associations between socio-cultural structures and nonfatal injuries in teenagers (13–17 years).

The area level analyses in children aged 13–17 years showed that the component “*narrow gender ratio in unskilled working positions and in politics*” and both indicators of *local alcohol-related crimes* were positively correlated with both male and female teenagers’ nonfatal injuries (see Figure 13). The correlations of the component “*wider income distribution*” and the indicator of *local alcohol consumption* showed different strengths and directions depending on gender. The component “*wider income distribution*” was positively correlated with teenage girls’ fractures and negatively correlated with teenage boys’ injuries. The indicator of *local alcohol consumption* was negatively correlated with teenage girls’ fractures and positively correlated with teenage boys’ injuries. No strong positive or negative correlations were observed between the component “*relative poverty*” and either teenage boys’ or girls’ nonfatal injuries.



*= P-value < 0.05

**= P-value < 0.01

Figure 13. Associations between sociocultural structures and the occurrence of nonfatal injuries in children aged 13–17 years in Skaraborg, Sweden (2000–2005).

Children's perceptions of injuries

The children (n = 29) described their injury experiences in great detail and provided a wide range of injury situations related to contact sports (football, basketball, handball, and bandy [floor hockey]), physical leisure-time activities (horseback riding, shooting [airguns], and playing with friends and animals), transportation (bicycles, scooters, and motorcycles), and non-physical leisure-time activities (sewing, handicrafts, and computer games). The children perceived severe injuries as those that require medical attention and cause long-term physical, psychological, and social consequences for them (see Figure 14). If the children were familiar with the situation or activity when they were injured they perceived the injuries as less severe or less dangerous, even if experts might interpret the situation as dangerous.

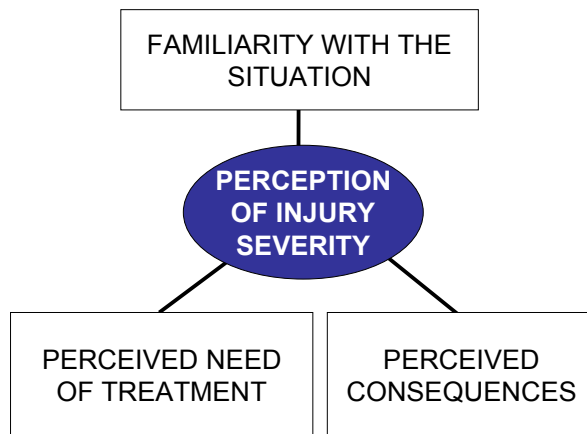


Figure 14. Children's perceptions of injury severity. Skaraborg, Sweden.

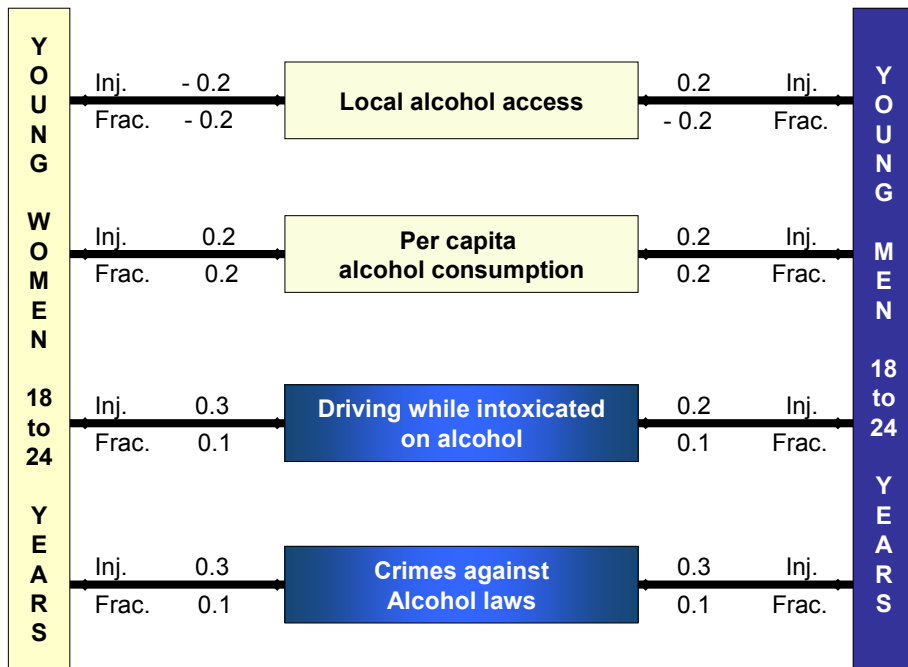
Children in this study usually attributed their injuries to personal and situational characteristics, although sometimes their injuries were 'just inexplicable' (see Figure 15).



Figure 15 Children's explanations of their injuries. Skaraborg, Sweden.

Area level associations between alcohol environment and nonfatal injuries in young adults (18–24 years).

The occurrence of nonfatal injuries in young adults was analysed only in association with the *local alcohol environment*; therefore, we do not present any associations between the local socioeconomic and gender structures and the occurrence of nonfatal injuries in young adults (see Figure 16). None of the analysed indicators of the *local alcohol environment* showed strong positive or negative correlations with nonfatal injuries in either young men or young women.



*= P-value < 0.05
 **= P-value < 0.01

Figure 16. Associations between alcohol environment and nonfatal injuries in young adults aged 18–24 years in Skaraborg, Sweden (2000–2005).

Young adults' perceptions of lived experiences of near-injury situations

Descriptions of 70 near-injury situations were elicited from the young adults (n = 19), and two themes were analysed to learn about their lived experiences of those incidents. From the analysis three main categories of the characteristics of the near-injury situations emerged: performing under pressure, close encounters with more or less unexpected environmental factors, and while learning (see Figure 17). Additionally, five categories were identified in the analysis of how the young adults managed the experience of near-injury situations: escape, release control, confront, cry out for help, or do nothing.

CHARACTERISTICS	MANAGEMENT
<ul style="list-style-type: none">• Performing under pressure• Close encounters with more or less unexpected environmental factors• While learning	<ul style="list-style-type: none">• Escape• Release control• Confront• Cry out for help• Do nothing

Figure 17. Identified categories of the characteristics of young adults' experience and management of near-injury situations. Skaraborg, Sweden.

DISCUSSION

This thesis arose from a wish to understand the relationship of the continuous interplay between individual and their environments with the distribution of nonfatal injuries in young people. In various versions of an ancient parable from India, a group of blind men (or men in the dark) touch an elephant to learn what it is like (see Figure 18). Each one touches a different part, but only one part, such as the side, the tail, the leg, or the tusk. When they compare notes on what they felt, they learn that they are in complete disagreement. This ancient parable illustrates how differently reality may appear depending upon one's perspective. The elephant in this thesis is injuries in young people, and two different perspectives, contextual and individual, were applied in this thesis to broaden and enrich the knowledge gained from the results.

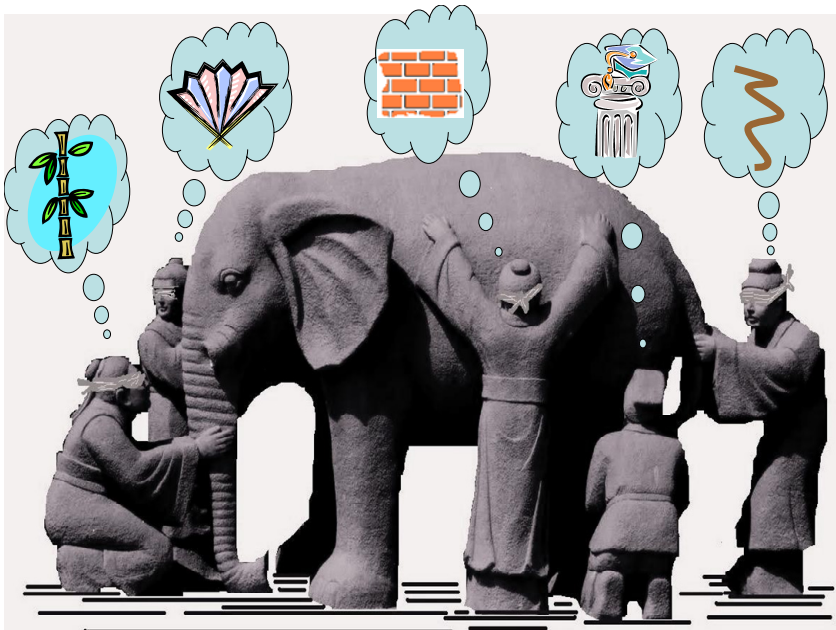


Figure 18. Illustration of an ancient Indian parable.

Because of geographical differences in the distribution of injuries in Sweden this thesis studied area level associations between sociocultural structures and the distribution of nonfatal injuries in young people from both a contextual and an individual perspective. The contextual perspective, based on ecological models²⁴⁻³⁹, suggests that age and gender differences in injuries are likely due to different exposures to injury-risk situations that can be partially explained by socialization processes in children and youth. Growing up is associated with the expansion of micro-systems and experiences that can increase exposure to injury-risk situations and injuries. The contextual perspective was used to obtain detailed data on the sociocultural structures that shape the daily lives and circumstances of the population of this part of Sweden.

An individual perspective was also used in this thesis because although much of the previous research into injuries in young people has focused on individual quantitative data, few efforts have been made to understand injuries from the child's point of view. The individual perspective used in this thesis focused on the experiences and perceptions of children and young adults.

Each of these perspectives, contextual and individual, can add new knowledge to our overall understanding and explanation of injuries in young people. As in the elephant parable, the results of this thesis have increased our knowledge of various facets of injuries in young people, but perhaps unlike the parable, the results have also improved our understanding of what we do not yet know. Any thesis points towards further necessary research and this thesis in particular points out to future studies since the approaches used aim to generate new hypotheses. Some of these recommendations for future studies will be presented below, together with a discussion of the findings and methodological considerations.

A call for the ecosystems approach

The logic behind the ecosystems approach used in this thesis was based on earlier studies suggesting that the local sociocultural structures can influence psychological and physiological processes in the population, which can in turn influence health^{32 36 40}. There is growing evidence that show that the health of the children can be influenced by sociocultural conditions in their immediate environment (family, peers and teachers)^{26 31 33 37 38 41 42}. Multilevel studies have also shown that sociocultural characteristics at the area level have effects independent of the individual characteristics on the incidence of injuries⁴³. An injury can therefore be explained by the interactions between individual, familial, and contextual conditions. Interactions between the contextual level and the individual level were explicitly not studied in this thesis, nor were potential interactions between the studied levels and individual elements of young people's micro-systems. The main findings and methodological considerations of the contextual level studies will be discussed first, followed by the main findings and methodological considerations of the individual level studies.

Main findings of the contextual level studies (*Papers I & II*)

Following the ecosystems models²⁴⁻³⁹, the findings of the contextual level suggest that local socioeconomic and gender structures are associated with the local distribution of injuries in young people. The strongest associations were found in children aged 6–17 years. For example, “*narrow gender ratio in unskilled position and in politics*” was positively associated with injuries in girls 6–17 years, and per capita alcohol consumption was negatively associated with fractures in girls aged 6–12 years, but positively associated with injuries in boys aged 6–17 years. Unexpectedly, no association was found between the alcohol environment and injuries in young adults.

Sociocultural conditions at the municipality level and injuries in young people

A very interesting result observed in the contextual level studies that indicates the need for further research is the association between the socioeconomic structure and the gender structure. This finding is in line with Walby¹⁴³, who claims that the larger context includes a complex social system in which different elements influence each other. Thus, changes in the socioeconomic structure might produce changes in the gender structure and vice versa as they

are elements of a larger system. This is illustrated by how changes in the labour market prompted by industrialization contributed to new family structures and roles as well as changes in socioeconomic and gender structures. Over the last decade internal and external forces have led to many contextual changes in Sweden, with implications for socioeconomic and gender structures as well as the alcohol environment. For example, national data show that the gap between rich and poor has increased since the year 2000, meaning that the gap in Sweden's current income distribution is wider today than it was 20 years ago¹⁴⁴. A recently published Swedish study at the municipality level found negative associations between income inequality and myocardial infarction in Sweden¹⁴⁵, which were explained in part by the Swedish socioeconomic structure and the suggestion that Sweden's large middle class and good welfare system may mitigate health consequences for those with low income¹⁴⁶. Geographical differences in gender equality in Sweden¹⁴⁷ may also affect socioeconomic structures at the local level.

Sweden's entry in the European Union in 1995 has contributed to increase the access to alcohol and alcohol-related problems in Sweden^{85 87 88}. From an ecosystems perspective, changes in sociocultural conditions at the contextual level may produce changes in how young people live and make individual choices in their micro-systems that in turn may affect their opportunities, perceptions, behaviours, and exposures to injury-risk situations^{148 110 149 104 150}. The efforts in this study to identify relevant indicators at the municipality level may be seen as pioneering work, particularly in its consideration of gender structure as well as in relation to the outcome measures and the target group. Few studies have focused on injury in children and young adults; rather the contextual factors used for adult studies have been expected to be valid for other age groups although the local context is quite different for different age groups. Thus, more efforts are needed to find more adequate indicators of the sociocultural conditions at the municipality level. Further research is also necessary to explore the interactions between different sociocultural structures and to understand the distribution, not only of nonfatal injuries in young people, but of other public health problems as well. It is important to note that societies are dynamic systems and that a given indicator might be appropriate during a certain period of time but less inappropriate at another. This finding suggests the importance of closer collaboration between public health research and regional authorities.

Gender structure and childhood injuries

The strongest observed associations between sociocultural conditions and injuries were observed between "*narrow gender ratios in unskilled working positions and in politics*" and injuries in boys and girls aged 6–17 years. One possible explanation of this finding could be that higher female participation in municipal governments may promote the involvement of girls in team sports (football and handball) and promote longer opening hours at sports facilities for female teams, issues currently under discussion in Sweden. Such strategies might increase girls' mobility, access to social and sporting activities, and exposure to injury-risk situations. When society promotes positive discrimination to give girls more equal access to public activities, especially to participation in team sports, girls will also have more equal exposure to injury-risk situations that may lead to more gender equal occurrence of injuries. The fact that "*narrow gender ratio in unskilled working positions and in politics*" was also associated with boys' injuries, however, needs further explanation. It could be that "*narrow gender ratio in unskilled working positions and in politics*" not only indicates more gender equality, but it could also be strongly associated with the socioeconomic structure, especially in low income groups. Increasingly there has been an interest in how different social positions interact with each other. Social and cultural expectations can vary depending on the local context and thus it might influence both girls and boys in different ways both within and

between the genders¹¹⁰. Local surveys are important to identify differences in prevalence, but they must increasingly be combined with studies aimed at explaining why such differences occur. In this study local indicators of gender structures were combined with survey data to explore new factors possibly involved in the development of injuries in both boys and girls. It was difficult to find relevant indicators, which will be discussed in more detail below, and it seems reasonable to call for more efforts into the development of gender-relevant official statistics not only for outcomes also for exposures.

Alcohol environment and injuries in young adults

Unexpectedly, the local alcohol environment was not associated with the distribution of nonfatal injuries in young adults (18–24 years) in spite of previous area level studies that found positive associations between different indicators of alcohol use, alcohol behaviour, and injuries in young adults^{77 78}. Selection bias due to young adults staying longer in the family home may be one explanation for this result. However, no data were available to confirm whether those who stay with their parents may be assumed to be less adventurous, less extroverted, more sedentary and/or more inclined to drink at home and in small groups with close friends. If these assumptions have some validity, however, this would reduce their exposure to injury-risk situations. Another possible explanation for the absence of association between alcohol environment and injuries in this age group might be methodological and related to their behaviours in seeking (or not seeking) health care for minor injuries or their having better coping strategies for avoiding injuries in hazardous situations.

Strengths and limitations of the contextual level studies

Two ecological studies were included in this thesis, and their findings should be interpreted with caution because the studied variables were aggregated data from a small sample of agricultural municipalities (n = 14) and because many of the studied variables were explored for the first time in this thesis. However, ecological studies can provide information to understand how place of residence affects the health of the population¹⁵¹. For example, the probability of adopting certain behaviours may depend in part on the degree to which the behaviour has already been adopted in the community. The special problem with ecological analyses (the ecological fallacy)¹⁵² arises when one makes inferences about individuals from group data. This problem was addressed in this thesis by ensuring that data collected at the municipality-level were analysed at the municipality level and not interpreted at individual, family, or neighbourhood levels. Further studies at the municipality level could benefit public health interventions since Swedish municipalities are the smallest administrative and political entities in which many decisions regarding injury prevention are taken and implemented. To promote such research, better understanding of the municipality as a complex ecosystem is necessary.

An important strength of the contextual level studies was the comprehensive local injury database, which included a wide spectrum of nonfatal injuries with information collected at both hospital and primary health care clinics. This strength, however, is somewhat limited by the confinement of the contextual analyses to the socioeconomic and gender structures and the local alcohol environments of 14 small and neighboring municipalities. The local injury surveillance system did not have national coverage, which may be seen as a disadvantage, but national coverage would likely have increased the difficulties of interpreting the results because of the variety of municipal cultures, structures, and environments, including number of inhabitants and geographical size of municipality, that should be considered.

Characterization of structures and selection of indicators

As recommended elsewhere^{43 123}, much time and energy was spent in the conceptualization and selection of the indicators used to obtain a better understanding and characterization of the three socio-cultural structures (socioeconomic, gender, and alcohol) of interest in this thesis. Earlier area level studies have found that poverty⁹²⁻¹⁰³, income inequality^{36 104}, and easy access to alcohol are associated with childhood injuries^{42 81 82}; however, those previous studies used different measurements, methods, and settings than those used in this thesis, and that may explain some of their incongruence with the findings in this thesis. For example, earlier Swedish research^{92 97-99} on the association between socioeconomic structure and injuries focused on measurements of socioeconomic deprivation (using different kinds of deprivation indices) and severe and fatal childhood injuries at the neighbourhood level. Also, the sociocultural conditions of Swedish urban neighbourhoods differ from the mainly rural municipalities in this thesis in terms of many factors including levels of income, levels of education, kinds of occupation, behaviours, living costs or expenditures, types of financial investments, and exposures to various and different injury-risk situations. It is also important to mention that the contextual studies included in this thesis used many indicators that are new or seldom used in Sweden or in studies of injuries in young people. For example, no earlier study was found that attempted to associate wealth or income distribution with injuries. This is also the first time that the association between the gender structure and injuries has been studied, and no earlier Scandinavian studies were found exploring whether the alcohol environment was associated with childhood injuries. Thus, although the contextual level studies in this thesis present pioneering work, the validity and relevance of the measures used can and must be discussed further. Comparisons with international area level studies will be even more complicated due to different municipal systems and responsibilities in different countries. Future studies in larger samples of municipalities are needed to test the new and the rarely used indicators in this thesis and if possible to discover better indicators to predict and work towards the prevention of injury in children and young adults.

Principal component analysis

In line with an earlier study by Walby¹⁴³, we explored indicators of socioeconomic and gender structures and found a possible interaction between these structures. Principal component analysis was used to combine the socioeconomic and gender structures as one element for analysis. As far as we know, this is the first time that socioeconomic and gender structures have been combined to study their spatial associations with any health problem. Further studies in larger samples are needed to improve our understanding of the interaction between these two sociocultural structures.

Specific age and gender analyses

One of the conclusions in a recent literature review of the association between socioeconomic structure and childhood injuries was that specific age and gender analyses are performed very rarely⁹². In this thesis the gender structure was analysed using different indicators and gender differences in the direction of the associations were noted. In this way it was possible to observe that the local gender structure could be one of the explanations of the observed gender differences in the direction of the associations between alcohol environment and injuries. For example in the analyses of children aged 13–17 years, ‘per capita alcohol consumption’ was negatively associated with girls’ fractures and positively associated with boys’ injuries. This is important from a public health perspective, since it may inform specific measures that may be need to be taken.

Main findings of the individual level studies (*Papers III & IV*)

The findings at the individual level (*Papers III & IV*) showed that children's perceptions of injury severity were broader than traditionally assumed by medical and other experts and that children's familiarity with certain injury-risk situations could lead to their underestimation of the severity of a possible injury. The analyses of young adults' experiences with and management of near-injury situations showed interactions between intrapersonal factors (such as knowledge, perceptions, attitudes, and behaviours), elements in the immediate environment (such as people, animals, and slippery surfaces), sociocultural factors (such as alcohol consumption), and institutional factors (such as short working contracts and the cultural conditions in team sports).

Children's perceptions of injury-risk situations

In line with earlier studies⁵¹⁻⁵⁵ the findings of this thesis suggest that children's perceptions of injuries and injury-risk situations are a complex interaction between rational and emotional systems, between what the children think about certain situations and how they feel about them. Also consistent with earlier studies^{54 55 59 153-155} the interviewed children could and did take rational decisions based not only on their potential vulnerability but also on the potential benefits of involving themselves or withdrawing from injury-risk situations. As in earlier studies^{21 22}, the children explained that sometimes they decided to do something just for fun or to learn something even if the activity might involve a risk of injury. In contrast with the previous studies^{21 22}, the interviewed children also understood that their injuries could be due to certain health conditions, a lack of concentration, or their unawareness of the risk. In this thesis, it was observed that sometimes the interviewed children perceived that an inanimate object (a pen, a stone, or a stick) attacked them, for instance, by jumping inside the wheels of their bicycles. An earlier study¹⁵⁶ suggested that children, as in this thesis, may use magical thinking as an explanatory tool when faced with unexpected situations for which they have no other explanation. The age of the children cannot explain this magical thinking, since other studies show that the inability to differentiate between fantasy and reality is not restricted to children^{157 158}.

Children's broad perception of injury severity

In this thesis children seemed to show a broader perception of the consequences of injuries than researchers and medical personal usually consider. Earlier studies^{21 159} have defined severe injuries as 'injuries that require medical/hospital attention'. The analyses of the interviews in *Paper III* show that children considered not only the bio-medical implications of injuries, but also mental and social consequences and possible effects on their future professional careers. This finding is in line with studies that show that children have a broad range of concerns that are often underestimated by adults⁵⁵. Further studies are needed to test this wide perception of severe injuries in a larger sample of children, especially those living in areas beyond Skaraborg. Another interesting finding regarding the children's perception of injury severity was its relation to their previous experiences with certain injury-risk situations. Children's familiarity with certain situations may lead to their underestimation of the potential severity of an associated injury. Earlier studies in children and adults have found that previous experiences of severe injuries do not always prevent further injuries^{56 57 160}, thus, further studies exploring children's interpretations of their lived experiences of injury-risk situations are needed.

Young adults' lived experiences of near-injury situations

In contrast with earlier studies exploring lived experiences of near-injury situations, this thesis did not focus on occupational situations¹⁶¹⁻¹⁶⁴. Instead this thesis explored a wide range of lived experiences of near-injury situations in different environments, including home, work, transportation, school, and leisure-time activities. The findings suggest an interaction of individual and environmental factors in injury-risk situations involving young adults^{25 26 165}. Some scholars have suggested that contemporary young adults, especially those in industrial countries, are a special age group that tests their skills in several new environments, while they also search for their identity¹⁰⁻¹². Young adults' frequent exposures to new environmental conditions may increase their risk of injury, and their lack of experience might influence their subjective interpretation of the situation. The observed interactions between individual and environmental conditions^{25 26 165} prior to their entry into the injury-risk situation and the way they managed the near-injury risk situation suggest that risk factors and risk perceptions interact at different levels in young adults' processes of assessing risk and avoiding injury.

Strengths and limitations of the individual level studies

According to Dahlberg et al.¹⁶⁶ the trustworthiness of qualitative results should be assessed based on credibility, conformability, dependability, and transferability; thus, the discussion of the strengths and limitations of the qualitative studies in this thesis will start with presenting a summary of how trustworthiness was applied in the qualitative results in this thesis (see Table 3).

Enrolment of participants

The recruitment of children and young adults took more time than planned. Large amounts of time were invested to identify the appropriate method and local key people to help in the recruitment of participants since the interviewers were not from Skaraborg. The involvement of some local key persons as a reference group in the research was very useful in the recruitment process. The recruitment of children was not easy, but the recruitment of young adults was even more difficult. More than 100 young adults were approached but most were not interested in the topic or not interested in participating in any kind of research. Some who were interested either did not have the time or forgot to come to the appointment. The least interested in participating were those contacted at the emergency room after a treated injury. Thus, further knowledge is needed about what can be done to increase young adults' willingness to participate in research.

Table 3. Assessment of the trustworthiness of the qualitative results in this thesis.

Qualitative criteria	Objective	Application in this thesis
Credibility	To obtain a better understanding of the data and the findings	<ul style="list-style-type: none"> • Analysis of different kinds of injury situations • Continuous movement back and forth between the transcribed material and the findings • Research triangulation • Seminars with external researchers • Findings illustrated with quotes from participants
Conformability or neutrality	To avoid preconceptions and misinterpretation of the data due to personal interests	<ul style="list-style-type: none"> • Inductive analyses • Research triangulation • Seminars with people from different disciplines
Dependability or consistency	To obtain the same findings by doing the same procedure with the same subjects	<ul style="list-style-type: none"> • Description of the research process in great detail • Seminars with people from different disciplines
Transferability	To apply the methods and results to other subjects and contexts	<ul style="list-style-type: none"> • Saturation point obtained (no new categories emerged) • Methods used can be transferable to other subjects, other contexts, and other research questions

Individual interviews in small groups

Many discussions and pilot interviews were conducted in order to construct the guidelines for the collection of the qualitative data from the children. Individual interviews were found to be the most suitable method to collect their individual experiences and perceptions of injury-risk situations and injuries. The use of open questions was valuable in obtaining a wide variety of experiences and perceptions. This advantage, however, was also a limitation since it was not possible to exclude children who could have some kind of behaviour disorder. Children were individually interviewed in small and homogeneous gender- and age-specific groups. This method provided a friendly environment that allowed the collection of rich material about the children's individual experiences and perceptions without feeling dominated by older boys, as was observed in the pilot group, where even the girls seemed to be seeking approval from the older boys in the group. In line with earlier studies^{17-19 21 22 167}, even the 9-year-old children were capable of describe their injury experiences in great detail. As shown in earlier studies^{17 18}, individual interviews conducted in small groups place less pressure on children than meeting an adult alone and listening to the other participants also helped to stimulate the children's responses.

The critical incident technique (CIT)

The qualitative data from young adults was collected using CIT¹²⁶. The guideline was constructed after many discussions and many pilot interviews with young adults. A professional with large experience in CIT interviewed all the young adults individually and face-to-face in a neutral place near to the young adults' place of work or residence. Because experiences of near-injury situations are not always easy to recall, a battery of questions regarding participants' lived experiences of injuries was helpful to remind the participant of the special kind of injury-risk situation of interest in the study. The most central concept of CIT is the importance of any very significant event or critical incident as defined by Flanagan¹²⁶, to the person being interviewed. This method allowed the collection of a wide variety of lived experiences of near-injury situations at work, in the transportation area, at home, and during leisure time. Except for one interviewee, who was excluded from the analysis because he had no near-injury situation to report, each young adult contributed with at least one specific lived experience of a near-injury risk situation.

Analyses of the qualitative data

The inductive analysis of the data gathered from children and young adults was undertaken with the aim of avoiding preconceptions and obtaining a better understanding of the data and the findings. As recommended by Graneheim and Lundman¹³⁸, the analysis involved a continuous movement back and forth between the transcribed material and the findings, and people from different disciplines were involved in the analytical process^{139 140} to increase the understanding of the data. This analytical process also was helpful in obtaining a saturation point in the data and increasing the credibility of the findings. Third, the findings were illustrated with quotations from the participants (*Papers III & IV*).

The ecosystem model and nonfatal injuries in young people

Using the ecosystem model²⁴⁻³⁹ as point of departure, the municipality can be seen as a complex local ecosystem in which young people are elements, as are their peers, family, teachers, trainers, local authorities, and the physical environment (see Figure 19). As elements in an ecosystem, young people can both influence and be influenced by the other elements in the system. The findings in this thesis suggest that conditions of the socioeconomic and gender structures are involved in the distribution of nonfatal injuries in young people. However, because the area level associations are based on two ecological studies with many limitations, interpretations must be made with caution. In line with the ecosystem model²⁴⁻³⁹, it is possible that contextual conditions could influence young people's everyday lives, including their perceptions, behaviours, and exposures to injury-risk situations. The findings also suggest that young people's perceptions of injuries and injury-risk situations are associated with their previous experiences and other people's perceptions and behaviours. Both previous experiences and young people's attitudes towards the expectations of others are interesting areas for future studies that highlight the interaction between social elements and injuries previously described. The desires to perform well and to live up to other's expectations might be underlying factors in the complex causal chain leading to an injury. Other factors in the municipality or local ecosystem (not studied in this thesis) that might also affect the distribution of injuries include peers and family conditions (opportunities, perceptions, and behaviours), school conditions, traffic, available leisure activities, and other people's risky behaviours (such as DWI). Even more distant conditions (such as national decisions) can influence changes in and between the different elements and levels of the local ecosystem or municipality.

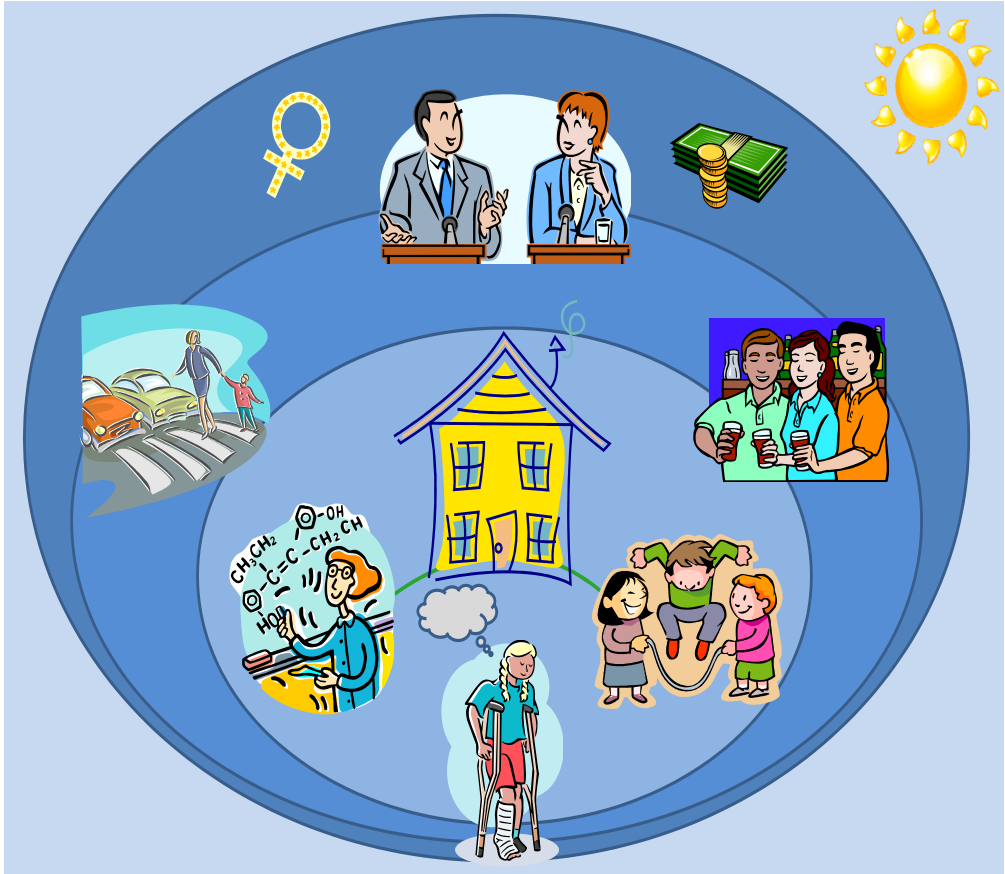


Figure 19. Potential elements of the local ecosystem, the municipality, involved in the distribution of nonfatal injuries in young people.

IMPLICATIONS

IMPLICATIONS FOR POLICY

Injuries in young people are a complex public health problem; therefore, their prevention requires multiple interventions at different levels. Local authorities should consider the sociocultural conditions of their municipalities, especially the socioeconomic and gender structures, when planning for and designing injury prevention strategies for young people. Since the findings in this thesis suggest an association between socioeconomic and gender structures and the local distribution of injuries in young people, it is possible that such structures may be also associated with other public health problems.

The only way that an adult can understand what a child thinks, perceives, and experiences is to ask the child about it. Young people's experiences and perceptions should be considered in order to develop better and safer places for children and young adults. Adults' perceptions of children's risks may not be reliably associated with children's real risks, given the many physical and social changes that happen over time. The Swedish context is still in dynamic transformation; the income gap is widening, alcohol access is increasing, and gender equality continues to progress. Thus, children's risk of injury should be understood in light of the interaction between individual conditions and contextual conditions.

Young adulthood (18–29 years) is a period of life that requires more political attention given that the risk of disability and death due to injury is higher in young adults than children and other adults. Young adults' exposure to new environmental conditions may increase their risk of injury, and their lack of experience might influence their subjective interpretation of the situation. Therefore, more efforts are needed to create safer environments for young adults.

CLINICAL IMPLICATIONS

The children in this study had a broad perspective on injury severity, including the psychological and social consequences of an injury. This finding emphasizes the need for increased awareness among health workers and parents of the psychosocial consequences of injuries. Another finding was that children's familiarity with an injury-risk situation (such as riding horses, skateboarding, or playing football) seemed to decrease their awareness of the potential negative consequences of the activity. This finding could be important for school nurses who play an important role in the development of safe environments for children and routinely share injury prevention messages with children in school.

FUTURE RESEARCH

As pointed out earlier, many of the contextual level indicators were used for the first time in this thesis and others have seldom been used in studies of nonfatal childhood injuries. Future studies using a larger sample of municipalities are recommended to improve understanding of the relevance of, and interactions between, these indicators, and to test the findings of this thesis. The indicators also need to be developed further.

The strongest area level association found in this thesis was between “*narrow gender ratio in unskilled working positions and politics*” and injuries in teenage children, especially girls, indicating that more efforts are needed to understand how we can better measure the gender structure and how girls' injuries are related to the gender structure. Further, because boys are usually overrepresented in injury data, gender-specific analyses could be of great benefit to understand gender differences in injuries. More research using gender-specific analyses could

provide more knowledge about both the occurrence of and risk factors for nonfatal injuries in boys and girls. More efforts are also needed to understand girls' injuries, since their injuries are seldom studied and it is possible that growing gender equality may reduce gender differences in injury frequency. An important question not addressed in this thesis that requires further study is how gender influences young people's perceptions, behaviours, and exposure to injury-risk situations.

Future studies should test the qualitative results of this thesis by recruiting a large sample of young people from different individual and contextual backgrounds. It could be helpful for clinicians, researchers, and people developing injury-prevention messages for children to know how children perceive severe injuries.

Despite children's awareness of their injury experiences and ability to reflect upon them in a way that resulted in data relevant for analysis, sometimes their injuries were felt to be 'just inexplicable'. More qualitative studies are needed to understand whether children are sometimes incapable of identifying the cause of their injuries or they are unwilling to blame themselves or other people, their pets or objects.

More studies focusing on near-injury situations in specific areas, such as at school and in sport, could be of great benefit in promoting safe environments. The study of near-injury situations could also be useful for the prevention of home injuries in elderly people.

CONCLUSIONS

This thesis explored nonfatal injuries in young people from both individual and contextual perspectives and found that sociocultural conditions at the municipality level were associated with the local distribution of nonfatal childhood injuries, and that young people's experiences and perceptions seem to be relevant conditions in the occurrence of their injuries. It is hoped that the findings in this thesis will provide points of departure for future research and for the development of local injury prevention programs.

The findings of the contextual-level studies suggest that socioeconomic and gender structures are associated with the local distribution of nonfatal childhood injuries, specially the gender structure. Unexpectedly, there were no strong area-level associations between the alcohol environment and nonfatal injuries in young people. Further, the strength of area-level associations varied by sex, age, nature of injury, and type of socio-cultural condition studied. The results of the contextual-level studies in this thesis confirm the importance of specific age and gender analyses for better understanding of potential contributors to injury risks for different age groups and genders.

The children in this thesis seem to have a holistic perspective of injury severity that health workers attending pediatric injuries should consider. Children's familiarity with the situation posing risk of injury seemed to decrease their awareness of the potential negative consequences associated with the activity. Young adults' frequent exposure to new environmental conditions may increase their risk of injury, and their lack of experience might influence their subjective interpretation of the situation. The findings of the individual-level studies in this thesis prove the value of individual interviews and qualitative analyses to our ability to understand injuries from the point of view of young people.

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