PUBLIC HEALTH IMPORTANCE OF CHILD LABOUR-RELATED INJURIES IN MONGOLIA: A COMPARISON WITH CANADA

by

Nansalmaa Myagmarjav Conway

Public Health Physician, Medical University (University of Health Sciences) of Mongolia, 1985

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN COMMUNITY HEALTH SCIENCES

THE UNIVERSITY OF NORTHERN BRITISH COLUMBIA

April, 2013

© Nansalmaa Myagmarjav Conway 2013



Library and Archives Canada

Published Heritage Branch

395 Wellington Street Ottawa ON K1A 0N4 Canada Bibliothèque et Archives Canada

Direction du Patrimoine de l'édition

395, rue Wellington Ottawa ON K1A 0N4 Canada

> Your file Votre référence ISBN: 978-0-494-94094-5

> Our file Notre référence ISBN: 978-0-494-94094-5

NOTICE:

The author has granted a nonexclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distrbute and sell theses worldwide, for commercial or noncommercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protege cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.



Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

Abstract

Child labour environments with significant health problems leading to non-fatal and fatal injuries are the pooled consequence of unsatisfactory work conditions and unhealthy behavior which may be cultivated by such circumstances. In Mongolia, nomadic herder children are susceptible to child labour-related injuries and most child laborers work in agriculture subsectors such as animal husbandry. Injury is the third-ranking cause of all Mongolian children's morbidity and the leading cause of children's mortality. Based on Chisquare test and odds ratio analysis, herder children were at increased risk of serious injury including head/neck trauma and bones broken while horse riding. The principal child labourrelated risk factor is riding horses for multiple chores. Psychosocial factors contribute to work stress and may further predispose these young workers to injury. Such injuries are of great public health importance in children's health. Evaluation of Canadian youth employment policy holds promise as a possible model for decreasing unsafe child labour and its deleterious effects in Mongolia.

Keywords: public health, child labour, injury, psychosocial factor

TABLE OF CONTENTS

Abstract		ii
Table of Contents		iii
List of Tables		v
List of Figures		vi
Glossary		vii
Acknowledgement		viii
Introduction		1
Chapter One	Background of Child Labour Environment Risks: Overview Labour environment risks Child labour related Injuries Prevention	4 4 7 11 14
Chapter Two	Methodology: Data sources Data exploration, input and process Data analysis Accuracy and limitation	19 20 22 23
Chapter Three	 Background: Mongolian and Canadian statistics about child labour related injuries Background of child labour and injury in Mongolian children Children's work and injury in Canada Comparison of general background of children's injury between Mongolia and Canada 	ur- 25 25 31 32
Chapter Four	Child Labour related Injury: Work environment for child labourers of Mongolia Child Labour Related Injury in nomadic herder children	34 34
	01 MOIIgolla Psychological factors for child labourers in Mongolia	30 44
	Conceptual model	48
	Workplace Injury in Canadian children and youth Canadian Experience in Youth Employment and	50
	Health Promotion	52

Chapter Five	Conclusions	57
-	Recommendations:	62
	Health Promotion	62
	Occupational Health	63
	Youth Employment Policy	63

Bibliography

65

.

.

List of Tables

Table 1. Number of child labourers in different work places in 2006-2007 by age	
Distribution	25
Table 2. Leading morbidity causes in Mongolian children aged 5-19 years between	
2007 and 2009 (per 10,000 population)	27
Table 3. Injury types in children aged 5-19 years between 2007 and 2009 in	
Mongolia (by number/percentage)	29
Table 4. Child labourers' animal husbandry work specifics, age and gender	
distributions associated with frequency of injury in nomadic herder	
children of Mongolia (N=113)	37
Table 5a. Association between head/neck injury and horse riding in Mongolian	
nomadic herder children, 2008	39
Table 5b. Chi-Square tests	39
Table 6. Comparison of fall-related injury between horse riders and non-horse riders	
among nomadic herder children in Mongolia (N=113), 2008	42
Table 7. Nomadic child labourers' animal husbandry work type, age and gender distribu	tions
associated with injury in rural hospital-Alagerdene, Mongolia (N=43)	43
Table 8. Association between psychosocial factors and children's tasks in Mongolian	
herder children, 2008	46

,

List of Figures

-

.

Figure 1. Age distribution of child laborers, Mongolia, 2007 (by percent)	26
Figure 2. Number of injury, poisoning and certain other consequences of external	
Causes in Mongolian children (by age groups)	28
Figure 3. Causes of mortality cases in children aged 5 to 19 years in Mongolia	
(2007 -2009)	28
Figure 5. Comparison of children's (5-19 years) unintentional fatal and non-fatal	
injury distribution between Mongolia and Canada	32
Figure 6. Hazardous work in children aged 5 to 17 years in Mongolia, 2007	34
Figure 7. Age distribution of injured child labourers, Mongolia, 2007	35
Figure 8. Daily working hours of nomadic herder children aged 9 - 18 in Mongolia,	
2008	36
Figure 9. Risk factors for work stress and psycho-trauma in nomadic herder	
children in Mongolia, 2007 (by percent)	45
Figure 10. Psychosocial factors in Mongolian herder children working at home and	
outside home, 2008	47
Figure 11. Conceptual Model – Child labour related injury in nomadic herder children	
working in animal husbandry	49
Figure 12. Injury cases in working children in British Columbia in 2007-2008	51

Glossary

<u>Child labour</u> – The term "Child labour" as defined by International Labour Organization (ILO; 2007) is work which is harmful to children's physical and mental development and deprives them of their childhood nature, self-esteem and life opportunities.

<u>Child labourer</u> – Children under the age of 18 who are directly or indirectly forced or coerced to work at home or outside it.

Working children – Children working as permitted by Labour Laws.

Youth employment - Hiring and paying children and youth, with work opportunity and regulations established by youth employment laws.

<u>Traumatic injury</u> - Acute disruption of cells, tissue, and/or anatomical structures due to sudden exposure to mechanical, gravitational, thermal, electrical, chemical, or radiologic energy.

Fatal Injury – Any death resulting from a traumatic injury.

<u>Non-fatal Injury</u> – Bodily harm or trauma resulting from acute exposure to an external force or substance (mechanical, thermal, electrical, chemical, or radiologic) or water submersion (Centers for Disease Control and Prevention [CDC], 2007) that does not result in death. Occupational injury – A traumatic injury that occurred during work.

Acknowledgements

I would like to extend my sincere thanks to the UNBC graduate office and financial department for scholarship support, my supervisors, Dr. Henry G. Harder and committee members Dr. Mandouh Shubair and Dr. Cindy Hardy for their advice and valuable comments, careful review of thesis drafts and other colleagues of Health Science Department for their encouragement and help. I appreciate very much Dr. Shannon Wagner's help in starting the first stage of my research activity. I would also like to express my gratitude to a librarian, Gail Curry of Geoffrey R. Weller library in identifying information and data sources, Mongolian researchers, Odgerel. T. and Nyamdavaa, Y., other medical statisticians, and the Alagerdene-rural hospital director, Uranchimeg, Kh. in providing me valuable data. I am also grateful for my family's encouragement while working on this thesis.

Introduction

From the perspective of many researchers and international organizations, such as those of the International Labour Organization (ILO) and Food and Agriculture Organization of the United Nations (FAO), child labour is a prominent global problem and a leading cause of long-term physical and mental health consequences, in both developed and developing nations. Children's life and work environments directly influence their current health status and future life expectancy. Child labourers are at high risk of suffering from workplace injuries. In addition to impacting individual children, child labour-related injuries are major epidemiologic and public health problems.

During the transition period from an historically socialist to a market economy, unemployment-related poverty increased in Mongolia during the 1990s through 2000s. Child labour in Mongolia increased during these challenging times for Mongolia's economy. Although the importance of child labour to public health may often be overlooked in Mongolia, it has been shown to have a considerable negative impact on children's health and development (Nyamtseren & Nansalmaa, 2006). To date, research on child labour-related injuries has been limited and under-reported in Mongolia, because child labour is often not a foremost concern among local authorities, and/or might even be intentionally concealed to avoid legal and other consequences. Therefore, more in-depth scientific research into the relationship between child labour and childhood injuries is needed to highlight the health consequences of child labour, as well as to generally establish what underlies physical injuries in Mongolia.

Therefore, this research examined the public health importance of child labour-related injuries in Mongolia and compared the findings with available surveillance data for Canada.

Moreover, the aim of this research was to study if/how child labor contributes to children's injuries and conceive ways to prevent these outcomes. The objectives were to: identify the prevalence of injuries associated with child labour in animal husbandry of Mongolia; compare the findings with Canada; analyze possible relationships between workplace conditions and types of injuries among child labourers; and offer useful recommendations for injury prevention measures for children at risk of injury, based on international health promotion approaches.

According to these preliminary literature findings (consistent with, e.g., Dorman, 2006; National Center for Farm-worker Health [NCFH], 2009; ILO, 2006), child labour often leads to occupational injuries and sometimes even fatalities among children. Many children who are working require medical service and follow-up medical care to address their workplace injuries.

During this recent period of rapid change and economic struggle in Mongolia, severe socio-economic crises led to a substantial extension of the informal mining sectors and the expansion of mining to remote towns. Working in mining and unorganized small manufacturing operations has been a documented cause of physical injuries, poisoning, and mental health struggles in Mongolian children.

Traditionally, from the earliest times recorded, the Mongolian people have employed children to help with their family and household animals. Sometimes children are sent to do unpaid work in their relatives' animal raising operations. Although many rural children may initially like to work with animals belonging to their family, the conditions in which these children work may end up being inconvenient, unsanitary and unsafe. These working conditions may carry many risks for the children involved and they may even suffer fatal or

severe non-fatal injuries. Many children suffering injuries may not get suitable medical aid in a timely fashion.

To illuminate the public health importance of child labour-related injury risks factors, this thesis also focuses on identifying effective and specific strategies for preventing labourrelated injuries in children. This research is intended to promote the exchange of best practices on youth employment and perhaps result in the introduction of the Canadian level of youth employment standards in Mongolia. If Canadian-like standards were introduced in Mongolia, the child labour related health risks might be reduced. Thus, the aim of this research was to study if/how child labour contributes to the injuries of children, then to conceive of feasible ways to effectively prevent these injuries. In this research, the population of interest is child labourers in Mongolia. This research paper consists of an introduction and five chapters including conclusions and recommendations. It was written at the University of Northern British Columbia in Prince George. One aim of this research was to describe the broad landscape of child injuries, especially those related to work, and then to discover how these injuries occur in Mongolia. This research identified the risk of child labor-related injury, focusing on the associations between child labour and nomadic herder children's injury.

Furthermore, this research strives to show that the prevention of child labour-related health challenges is based on the identification of occupational conditions. The results of this research suggest important ways to prevent child labour related health challenges based on analyzing and comparing data on child labour injuries in Mongolia with those in Canada.

Chapter One. Background of Labour Environment Risks

Overview

While child injuries are now widely recognized as a growing global problem, their effective prevention still requires urgent and well-organized efforts (Peden et al, 2005). The World Bank has estimated that per year, 2.5 million disabilities and 32,000 fatalities result from a total of 6 million work-related injuries in children (Graitcer & Lerer, 1998). According to the Convention on the Rights of the Child issued by international agencies in 1989 (HER-Net, 2008) the health and development of all children under 18 years of age must be protected. Child labour is prohibited by law in many countries. Nevertheless, in reality, the number of child labourers may not have been reduced over the years and child labourers still suffer from occupational injuries and illness (NIOSH, 1997). Child labour is increasingly a human capital problem, measurable by its impacts on health (Dorman, 2008). The International Labour Organization (ILO, 2006) reported that worldwide there were as many as 317 million children between the ages of 5 to 17 years who were being paid for work. Of these children, 218 million were considered by the organization as being child labourers. The United Nations Children's Fund (UNICEF; 2010) reported that one in six children (158 million) aged 5-14 years are engaged in child labour worldwide: 69 million of these in Sub-Saharan Africa and 44 million in South Asia. The Asia and Pacific regions combined have the highest number of working children under 14 years of age overall (Hemal, 2009). The ILO (2006) estimated that 2.5 million children under the age of 15 years worked in industrial nations during 2000.

Based on the ILO estimates, researchers reported that in developing countries there were over 180 million children between the ages of 5 and 14 years who were working full

time (Alem et al., 2006). Thus, child labour is still common, both in industrialized and developing countries. Many children and adolescents under 18 years of age work (illegally or legally) worldwide. It is not surprising that children who are living in developing countries are more frequently involved in child labour, due to poverty, and hence more vulnerable to labour-related injury.

Of 68,580 children who were included in a survey from the Mongolian National Statistics Office (MNS, 2007) and Employer's Union of Mongolia (MONEF, 2010), 11.5% of them aged 5 to 17 years were involved in child labour in 2006-2007: 91.7% of those in agricultural sectors, 1.0% in small industries, 0.8% in mining, and 0.5% in hotels and restaurants. Moreover, Mongolian National Statistics for 2004 reported that, overall child labourers under 12 years of age work an average of more than 12 hours per week and children under 18 who work in hazardous and other physically demanding labour fields work for 43 or more hours per week (Edmonds, 2008).

Today, the physical and psychological well-being of labouring children is damaged by work-related injury and deaths due to inadequate workplace conditions: unsafe industrial practices, violence, insufficient physical protection and unsafe occupational conditions in combination with supervision with a low level of management expertise and high level of human physical demands (CDC & NIOSH, 2010). Child labour-related injuries affect the Disability Adjusted Life Years (DALYs) and lead to an increased number of Potential Years of Life Lost (PYLL) and Years of Life with Disability (YLD) in children (Dorman, 2008). In information from the National Center for Farm worker Health (NCFH; 2009), the workplace injury-related death rate in children under 15 years of age was 21% of all youth's fatalities in 1992-2000 and 43 occupational death cases per 100,000 children 1995-2002 were registered

in the United States. Thus, in the United States, child workers' injury is four times higher in agricultural sector than in other industries.

Modern farming systems now widely used in the agricultural sector are reliant not only on multiple and specific pesticides but also on animals often confined in large numbers, with concomitant exposures to infectious agents, dusts, radiation, a wide variety of chemicals and other toxic substances (Brian, Chiu & Blair, 2009). Morbidity and mortality come from traumatic injuries and from acute and chronic poisoning including pesticides, medicines, other chemicals and toxic substances in agricultural workplaces such as those resulting from bites or stings by venomous animals. Others have found that "45,000 deaths of acute poisoning per year and 1.8 per 100,000 of global death rate of poisoning occurred among children and youth with age less than 20 years". The frequency of these cases is 4 times higher in developing countries than in developed countries (Peden et al, 2008, p.123).

Children may be at elevated risk of being involved in accidents due to their agerelated inexperience and physical development specifics; child injury cases are often of higher frequency than adults (Dorman, 2008). For example, the American National Institute for Occupational Safety and Health (NIOSH, 1997; 2010) confirmed that the frequency of general injury cases in children aged 16-17 were two times higher than those for all ages combined during 1990-92 and nonfatal injury related emergency service visits per 100 fulltime worker equivalents (FTEs) were also 2 times higher for youth age 15-17 years than for the entire working population during 1999-2003.

Dorman (2008) summarized that children's work hazards are like those of adults, but amplified by their unique anatomical, physiologic, and developmental needs.

Mercury and its compounds (used in extracting gold from pulverized ore) are among the widely-used dangerous chemicals which produce neurotoxicity (Grandjean, 1999).

Labour environment risks

According to the ILO (2006) report, worldwide child labour rates decreased by 25.9% in 2004 compared with 2000, but around 58% of child labourers between 5 and 17 years were engaged in hazardous work such as the mining, manufacturing (e.g., tobacco industry, glass works), construction, and gas production sectors in 2004. The latest worldwide figures show that 115 million children, aged 5-17 years work in hazardous and most dangerous conditions, and around 22,000 children worldwide are killed at work every year due to injuries or illness (ILO, 2011).

Many child labourers work within a poor labour environment that includes: lowopportunity work conditions, noise, indoor and outdoor air pollution, and poor ergonomic task and tool designs. For example, of all working children, 54% of those employed in tobacco, 48% in coffee and 40% in tea enterprises, and 39% in rice production had experienced physical injuries while at work (Obua, 2004).

With exposure to mercury during gold high-grading, mercury poisoning can develop, causing a broad range of physiologic and neuropathic illnesses associated with multiple definable psychological and neurological disorders in children. The mining industry is a highrisk workplace with multiple health hazards such as noise, darkness, infiltrating water, methane and sour (H₂S) gas, dust, and mass casualty mine disasters (e.g., tunnel/roof collapse, explosions), some of which, beyond posing risks of acute traumatic death, may also lead to musculoskeletal and traumatic occupational injuries (CDC/NIOSH, 2010).

Agriculture is a major economic source utilizing large rural areas and posing increased risks to workers. It is the most dangerous work sector, with very high numbers and rates of traumatic death, injury and disease among their population (Stromquist et al, 2009). Therefore, agricultural work poses a high risk of injuries and fatalities for exposed workers, including children (Douphrate et al, 2009). Child labourers are at significant risk of injuries caused by falling. For example, in Asian countries the mean incidence of fall injuries was 170 per 100 000 per year (43% of all injuries) in child labourers aged less than 18 years. This most common type of injury has harmful health consequences (Peden et al, 2008).

Major risk factors for severe injuries (fatal and non-fatal) include unsafe agricultural equipment and heavy farming work in developing countries (Dorman, 2008). Children's physical and mental health may be more vulnerable than adults' to harsh weather and hazardous substances, such as pesticides in farm work, because of their rapid physical and cognitive development (NCFH, 2009).

All of the above findings show that child labour is not only common but may also contribute to increasing the total number of cases of children's illness and death. Canadian health professionals found that risky behaviors and unhealthy occupational conditions are the most important factors in the prevalence of visceral and musculoskeletal disorders and reproductive health problems among adolescents (Health Canada, 2007). Mongolian children who are working in gold mines suffer from a variety of health problems including respiratory and urinary tract diseases as well as joint- and organ-related pain. For example, a total of 42.6% of 40 child labourers reported aches in their limbs and backs, while 28.6% suffered from kidney and urinary diseases, and 28.6% from fatigue (Navch et al, 2006). A joint survey from international organizations found that the prevalence of morbidity and health problems

such as pains in body parts, fatigue and headaches in labourer children is higher than in nonlabourer children (Guarcello, Lyon & Rosati, 2004). The interaction between health status and injury, the impact of uncomfortable work conditions and work processes, may affect people's health and cause various illnesses and result in severe injuries (Cornelio, 2010). Thus, children may be more susceptible to work-related illness, and ill children may, in turn, be more likely to suffer from injuries.

The information outlined above provides evidence that harmful working conditions for child labourers and their resulting childhood illnesses might lead to workplace stress. A French researcher, Michael (2002) stated that stress is a psychosocial factor which causes an increase in the likelihood of injury among children. The General Social Survey, a survey conducted in households of the United States, found that between 30% and 40% of participants felt that their work was "often" or "frequently" stressful (NIOSH, 2002). In a study that analyzed psychological outcomes of hospital patients from 1995 to 1998, Danish researchers found that 14,166 hospital inpatients and outpatients, aged 18–65 years, were treated for affective or stress related disorders. They concluded that employment in occupations involving exposure to work-related threats was a major risk factor for these stress-related disorders (Wieclaw et al., 2006).

The degree of control exerted by their employers and the lack of personal freedom in combination with inadequate pay, high responsibility, and lack of access to education may all contribute to undermining the dignity and self-esteem of children (Alem et al., 2006). An estimated 780 per 100,000 people in Great Britain who worked in 2009-2010 suffered from stress caused or made worse by their current or past work (Health and Safety Executive, 2010). The Canadian Mental Health Association (CMHA, 2010) suggested that more than

18% of youth in Canada (ages 15 - 24 years) struggle with mental health problems. The CMHA indicated that mental health disorders often lead to the disruption of a child's ability to function at home, in school, or in their community.

Mongolian researchers have found that workplace violence, stress and discrimination are all causes of occupational health problems. Of Mongolian miners surveyed, 42 percent were the victims of violence and stress in their workplace (Nach et al, 2006). Of a sample of 40 child gold mine labourers aged 12-18 years, 30% felt that their stress was caused by violence (20 percent), verbal abuse (15 percent) and the inability to have their work officially acknowledged and monitored (15 percent). Once again, it is important to emphasize that childhood stress-related injuries may have significant negative effects on the child's future physical and psychological development. Thus, with regard to the above findings, stress and injury may interact.

Adolescents' risk taking behaviour such as drinking alcohol, smoking and other substance use may further contribute to occupational injuries being common in the workplace (Tursz, 2000). Some epidemiological data indicate that many employed people drink heavily, leading to a variety of adverse consequences and problems (Roman & Blum, 2002). An American researcher, Windle (2003), found that high-risk behavioural problems such as substance use and experiencing violence contribute to some students leaving their high schools. Without regular schools, children who drop out or are removed from their schools are at higher risk of engaging in high-risk behaviours and may be forced to enter the workforce at an earlier age. Pickett et al. (2006), in a study which surveyed 7235 Canadian school children aged 10 to 16 years, found that many children engaged in multiple risk behavior such as smoking at the same time as drinking alcohol and using drugs. This risk taking behavior in

adolescents was found to be a significant etiological factor for injury. Thus, high risk behavioral problems are not only present in schools but also commonly occur in children who are working. For example, the International Programme on the Elimination of Child Labour (IPEC, 2006) found that emergency calls and health care delivery that resulted from alcohol use were common among Mongolian adolescents in mining towns. Youth are believed often to copy health risk behaviors, such as smoking, drinking, drug abuse, habits which may be long-lasting (Crockett & Peterson, 1993).

Child labour related injuries

In comparison with an adult workplace study, when children work in the fields, these consequences can become even greater for them than for adults because of their lack of experience and their still-developing bodies (NCFH, 2009).

Occupational safety standards are important in preventing work-related injuries. Nevertheless, among 40 children working in Mongolian mines surveyed, 87.5% said that they had no knowledge or awareness of the safety and health standards at their sites (Navch et al, 2006).

According to the annual report of the Mongolian National Statistical Office (MNS, 2007), in the overall population, injury and poisoning are the leading causes of inpatient mortality, 105.9 cases per 10,000 population - 19.2% of all injuries affecting the population in 2007. In the first quarter of 2011, 118 injuries occurred in children, two of them from chemical poisoning and one from a mining injury (Secret, 2011). It is estimated that 18% of all children aged 5 to 14 years of age are involved in child labour in Mongolia (UNICEF, 2010). In a random survey (National Committee for Human Rights [NCHR] & ILO, 2008) including nine provinces and one city, 6,950 children aged 9 to 17 years worked as labourers;

16% of them were injured during their work. Of these children, 34% were non-schoolattending: 6.4% of them worked in construction, 17.4% in animal husbandry and 10.1% in gold mining in Mongolia. In addition, psychologists and sociologists have argued that unpaid child labour, which is likely common everywhere in the form of household chores, affects children's intellectual development and mental health (Hobbs, McKechnie & Lavalette, 1999). For example, a Mongolian National survey included 270 children aged 6-17 years who were working in animal husbandry chores. According to this study, 30% of them worked for their siblings, 41.9% for other relatives and 28.1% for other herder households (NCHR & ILO, 2008).

The Mongolian Research Clinics for Trauma Studies reported that 22.5% of all of Mongolia's injuries occurred in children aged 0 to 18 years in 2010. Of these, 32% were due to falls and 22% due to violence (Dolgorsuren, 2011). Traditionally, horse racing is one of the major national games of the annual Mongolian summer festival. Small boys under 7 years old who have experience in riding horses are pressed into service as jockeys in a horse race over distances of more than 15 kilometers across the steppes. Horse races with child jockeys are one form of child labour, both paid and unpaid. The National Centre of Traumatology (NCHR&ILO, 2008) found that 816 cases of horse racing- related injuries in children were registered in Mongolia in 2003-2007. These injury cases constitute 0.3% of all in- and outpatients with injuries.

Child labour is restricted by Labour Law in Mongolia. However, according to survey results from the National Board for Children (NBC); and other local offices of Save the Children (SC) and UNICEF (2006), children also work in risky informal sectors, including gold mining and collecting coal, which may lead to serious health problems. For example,

Mongolian researchers found that the average age of the children who engage in gold mining is 15, most of them are boys, 75% are school children, and 15% are without formal schooling (from two field surveys in 2004 by Navch et al, 2006). ILO (2006) and Nyamtseren and Nansalmaa (2006) found that informal mining of gold in Mongolia often uses elemental mercury as a processing agent, without the miners, even youthful ones, having any instruction or protective equipment. Mercury and its compounds are commonly used in medical, agricultural, mining and many other industries. Mongolian researchers studying children who were working in informal gold exploration found that their urine contained 1.32 times higher level of mercury than the permissible limit (Tsevelmaa & Saijaa, 2004). Injuries which occurred in Mongolian mines were found to be recurrent, severe, and sometimes fatal (Navch et al, 2006). Therefore, some Mongolian children work in unsafe work places without protective equipment and suffer hazardous consequences.

Work-related injuries have been reported in Canadian youth. For example, in 2008, among 42 cases of injuries in children aged 12 – 14 years in British Columbia, 56% of them were sustained while working in the hospitality industry; 8% in construction; 8% in agriculture; and 4% in other manufacturing (Gosal & Company, 2011). In addition, according to Boyce et al. (2008), "42% of injured among school children required medical treatment during unpaid or paid work in Canada" (p.114). One of the few such studies available documented that, although child labour restrictions have been implemented in Canada, illegal child labour exists in Nova Scotia involving children less than 19 year. However, limited research appears to have been completed on child labour in Canada and it is a critical issue that needs to be further studied (Alicia, 2007). Canadian child injuries in the workplace may be underreported (Gosal & Company, 2011).

Interestingly, the Food and Agricultural Organization (FAO) and the International Labor Organization (ILO) encourage the promotion of employment for youth aged 15 to 24 years and creation of youth employment in the agricultural sector, because 400 million youth are unemployed worldwide (FAO & ILO, 2010). The Canadian Tourism Human Resource Council (CTHRC, 2010) released figures showing that the average rate of youth employment increased by 8% among 15 -24 year old youth in Canada in 2007 in comparison with 1997 in Organization for Economic Co-operation and Development (OECD) countries. Thus, youth employment is higher in Canada than in other developed countries such as the United States, Australia and some European countries. In comparison, according to the European Union Labour Force Survey, youth unemployment (15-24 year olds) is 2.5 times higher than other age groups in European Union Member States (European Commission, 2010). In Canada, more youth not only work but also go to university/ college and other schools. For example, in 2005, the incidence of school drop-out in Canadian secondary school children was lower by 4.3% than OECD countries' average rate (CTHRC, 2010). Therefore, suitable legislation that ensures decent working conditions for children may help to decrease child labour and, consequently, prevent child labour related injuries.

Prevention

The above facts indicate that as developing humans, children may be particularly susceptible to the deleterious effects of hazardous work, and may suffer lasting or permanent effects as a result (Alem et al., 2006).

Clearly, work place-related problems may have a harmful impact on children, particularly on adolescents involved in child labour. According to the reports studied, children who are involved in child labour are frequently exposed to traumatic situations. Child labour

carries a variety of potentially negative health outcomes on physical, reproductive, psychological and behavioral development. Thus, today child labour is recognized as a major global public health problem. Unhealthy workplace environments which expose child labourers to injury and illness risks may be contributing to health disparities among children. In addition, child labourers may be a higher-risk group for chemical and pesticide poisoning and accidents. Measuring the frequency of such injuries among child labourers is important in being able to assess the effectiveness of programs intended to improve occupational health conditions (ILO, 2006). However, data on the prevalence of these risk factors with international comparisons between child labourers and non-labourers do not appear to be readily available.

As for medical access, working children are often far from health care services, in particular too far from the qualified child injury treatment professionals, psychologists and other medical specialists they may need. They may only have access to family doctors not adequately trained in child and adolescent injury prevention and management.

According to the above-mentioned research, child labour is quite common in Mongolia, and in particular, children working in mining, other hazardous industries, and animal husbandry and herding may face significant public health problems. Therefore, child labour-related injuries and fatalities are significant and serious public health problems and should be a priority. This is for humane reasons and more practically, because in order for children to be most productive later in life, they must not be seriously affected by child labour.

Improved reporting systems and prevention-oriented research are important tools to reduce occupational injuries and fatalities (Conway et al, 1999). However, Dorman (2008)

noted that, although a great number of studies examined the relationship between child labour and health, there are few that have recommended measures to mitigate this connection.

To reduce children's involvement in child labour, especially in the most hazardous work, cooperative actions such as public awareness and information, studies, and the use of a variety of media tools as implemented in many other countries may be helpful. However, these interventions have not been wholly effective and child labour still continues (Rialp, 1993). The effectiveness of injury prevention is influenced by demographic characteristics and socioeconomic conditions, but risk factor-related alternative approaches of public health are specific and powerful for reducing the definable determinants of injury (Teutsch & Haddix, 1996). How to reduce or eliminate child labour related injuries is not always agreed upon: for example, should the child abstain completely from work, or should the tasks be adjusted/ limited to be age-appropriate?

Prevention of occupational risks, the protection of health and safety, and health promotion are key principles of public health policy (Bagott, 2000). In Healy and Kerr (2010), key factors influencing population health are work environment and employment. Effective population and public health planning should include working conditions as well as personal health and social supports (Pinder, 2007). Children may be disproportionately affected by the built environment where they learn, play, and work (Peden et al, 2008). It has been asserted that ecological and environmental conditions including culture, socio-economics, laws and policies, are basic nutrients for children's and youth's development (Siddiqi et al, 2007). Health promotion is also an essential activity to deploy addressing social, environmental and economic conditions (Nutbeam, 1998). Thus, one of the most promising preventative measures is the health promotion approach. Canada has already demonstrated new health

promotion efforts in many areas, through its population health and new public health strategies, such as the "bottom-up" approach, applying quality of life and environmental changes based on the Ottawa and Bangkok guidelines and other models (Frohlich & Poland, 2007). "Healthy child development, personal health practices, working conditions, and social support networks are important aspects of population health strategies" (Pinder, 2007, p. 95). Researchers emphasize that child labour exists often where inadequate family income requires children's work (Edmonds & Schady, 2011). International organizations have emphasized that reducing family poverty is an essential issue for Mongolia, because poverty incidence was 32% in 2005 (ILO, UNICEF & World Bank, 2009), very high despite recent rapid economic development. For example, of working children, 60.8% worked to augment their low family income (MNS, 2008). Thus, it is clear that lack of minimum needs including food, clothing, or school supplies, due to poor living environment, may lead to child labour, and it is associated with the increased frequency of serious injuries to working children in Mongolia. Parents of working children in animal husbandry sectors reported that of herder children, 28% worked primarily due to lack of family income, and 18.2% due to lack of an adequate family work force (MSWL et al, 2009). New Zealanders found that changing social economic conditions and increased family income had a result of decreasing the proportion of children living in rented dwellings and increasing those living in privately owned, although often mortgaged, houses (O'Brien, 1998). Another researcher, Menendez (2009) from the University of Chicago asserted that family income is a powerful factor in reducing child labour: if household poverty decreased, the children could stop their work in inadequate places. In relation to health promotion approaches, "behavioral change needs to be supported by environmental conditions" and maintenance (Frohlich & Poland, 2007, p. 49). Moreover,

the environmental health promotion which is associated with social epidemiology creates sustainable health outcomes to reduce inequalities at multiple levels including social, health and lifestyle environment (Schulz & Northbridge, 2004).

Thus, improving and translating modern health promotion materials targeting child labour must be applied to reduce child labourers' health problems and injuries. This research will also focus on health promotion interventions to eliminate inadequate child labour.

Child labour-related health consequences are critical points for researchers. Nevertheless, this concern still has not been applied sufficiently; it has received too little emphasis, and undercounting and un-documented cases of injuries and risk exposures in working children are arguably still prevalent (Dorman, 2008). Adequate data for occupational injuries and illness have not been collected in the child labour field (NIOSH, 1997). Available and comparable research data are insufficient in this field. In practice, the most complete studies of child labour's consequences are often carried out by non-governmental organizations (NGOs), more of these in cooperation with international agencies than with governments. Therefore, the cooperative work among scientific researchers, NGOs, and international organizations provides researchers with important tools to identify child labourrelated challenges and potentially to gain access to improved outcomes.

During this literature review these research questions arose: If/how child labour contributes to the injuries of children? What type of child labour is associated with what type of injury? How could we prevent the most common child labour-related injuries?

Chapter Two. Methodology

Data sources

Existing numerical data on child labour-related injuries in Mongolia and Canada was analyzed using recent data from both countries for 2007-2009. This study was carried out for Mongolia based on data exploration of: a nationwide injury report for 2007-2009, a Mongolian national child labour survey report for 2007 from National Statistical Office, pilot survey reports on herder children in 2008 from the Mongolian National Statistical Office, Ministry of Social Welfare and Labour of Mongolia, Country Office of International Labour Organization in Mongolia, Health Statistical Department of Health Agency and a village hospital of Alag-Erdene district, Khuvsgul, Mongolia. In addition, labour force, Census, Canadian Socio-economic Information Management System (CANSIM) reports from Statistics Canada and injury reports from the Canadian Institute for Health Information, and the Public Health Agency of Canada were employed. World Health Organization data were used for both nations. Original data from interview records of a survey which was conducted in 2008 among nomadic herder children were obtained from the research authors in Mongolia, to compare to the published data. General injury data in Mongolian children nationwide aged 5-19 years were grouped into ages 5-9, 10-14, and 15-19. A stratified analysis was conducted for major injuries in children aged from 5 to 17, and reports from child labour surveys were used to further investigate the incidence of injury types among herder child labourers and other working children in Mongolia.

Available data on general (including occupational and non-occupational) injury of working young adults in Canada was obtained electronically from web pages of Statistics Canada, the Canadian Institute for Health Information (CIHI), and Health Canada using UNBC (University of Northern British Columbia) library databases along with Public Use

Micro-data (PUMFs) and CANSIM files. Both Statistics Canada's Census and the quarterly Labour Force Survey (LFS) provide data for working youth over the age of 15, and permit cross tabulations. In addition, reports of World Health Organization (WHO), UNICEF, FAO and ILO were employed as needed.

To obtain additional information on child labour conditions including work experience, working hours and related factors to compare the two nations' exposure during the study period (2007-2008), the researcher compared the annual reports from the National Statistical Office of Mongolia, Public Health Agency of Canada (PHAC) and Canadian Centre for Occupational Health and Safety (CCOHS). This provided perspective on workrelated injury characteristics, types of injuries, and potential injury risk factors in working children in both countries. The data exploration procedures for Mongolia focused on at-risk children who are nomadic child labourers. Other possible sources of information on sociodemographics of child labourers, for example, age, gender, and job task of Mongolian nomadic herder children were obtained from the above-mentioned National Statistics. Information on existing Canadian labour laws, guidelines and other legislative sources for youth employment was obtained through the electronic data bases of Human Resources and Skills Development Canada (HRSDC).

Data exploration, input and process

Child labour-related exposures including: number of working children and nomadic herder child labourers; their age groups; gender; work type; psychological factors; types of animal herding chores in nomadic herder children; and number of different type of injury cases were explored. Data investigation was conducted July-December, 2011 and Mongolian data was explored during August-September, 2011 in Mongolia, then subjected to adjustment

and additional data investigations in October-December, 2011. This research was designed to identify the incidence and risk factors for child labour-related injuries.

In this research, characteristics of working children, herder child labourers aged 5-17 years; animal husbandry work task specifics; exposure and injury cases and deaths; and prior history of injury were examined for 2007-2009 national data for Mongolia. Comparable data for youth employment were found for Canadian youth only for ages 15-24. These data were checked, identified and sorted prior to recording and tracking. Thus, the researcher focused throughout data selection and exploration on different available data for their suitability to the study purpose and research questions.

The first stage of recording was to choose the applicable data such as number of working children, child labourers, work specifics and injury cases from among numerous categorical data. Selected data were then coded and entered into Microsoft Excel and tables analyzed, then charts and graphics were created. During this analysis, the researcher coded and categorized data numerically using standardized selection procedures for the following variables: age, sex, features of child labour tasks and injury types. Analyses were conducted initially using Excel Microsoft software, then more extensively (after converting) in SPSS v. 18. Data files were cross-checked for accuracy prior to each major step of data analysis and interpretation. A retrospective analysis was conducted of prior reports of injury from 2007 to 2009. The researcher recoded data from various sources to facilitate the merging of data from multiple sources for 2007-2009. Data spreadsheets were used broadly to re-categorize, organize, calculate, edit, compare, update and customize data. Data were classified and coded for software analysis. For example, animal husbandry work-specific operations (horse racing/riding horses-1, herding animals-2, housework-3, chores for animal care-4, lambing

sheep -5), gender (male-0 and female-1), and injury types(1 –head/neck, 2-bone broken, 3minor, 4 – cut, 5- burn, 6- frozen and 7- zoonotic infection). Children's ages were grouped variously 5-9; 10-14; 15-17 years in child labour survey report; 9-10; 11-12; 13-14; 15-17years in herder children's survey in Mongolia (MSWL et al., 2009), 5-9; 10-14; 15-19 years in national injury report of Mongolia (Mongolian Health Statistics, 2008/2010) and injury report from Canadian Institute of Health Information (CIHI, 2008/2010) and 12 and over; 15-24 (Statistics Canada, 2010/2011). These varying age groupings often precluded comparison across data sets.

The reported and tracked numerical data in Excel tables were imported into SPSS to analyze (observed and expected) data. Then data outputs were interpreted.

Data Analysis

Means were used to summarize continuous variables such as children's age and working hours. Age-specific morbidity and mortality rates of injury were calculated and expressed using the formula: $\frac{\text{cases of injury in age groups} \cdot 10000 \text{ (or 1000 for deaths)}}{\text{Stratum-specific # of children at mid-year}}$

When reported data by age group were to be analyzed, they were first converted into mean age. For example, age group for 13-14 years was estimated using the mean 13.5. Frequencies and percentages were used to describe the distribution of categorical variables such as prevalence of injuries. Injury incidences were analyzed using a Chi Square test of Independence for multiple variables using the SPSS-18 software program (Norusis, 2011) to compare other independent variables. The same approach was used to examine the results versus chance between observed and expected variables such as injury mechanism, work type and other risk factors (e.g., age, gender and psychosocial conditions) to examine the significant effects among these variables, identify what variables were major risk factors and test the research hypothesis (various types of injuries among child labourers were associated with children's age and work characteristics and psychosocial factors could contribute to child labour related-injuries). In addition, odds ratios (ORs)and 95% confidence intervals (95% CI) were calculated to measure the strength of association between falls related head/neck injury and horse riding of nomadic herder children.

A conceptual model was used to test potential associations, based on the implied connection between the incidence of child labour injury and potential main risk factors for child labour-related injuries such as riding horses, herding animals, and other hazardous work characteristics and their possible relationship to various injury types. This method described the research outcomes and the determinants of child labour injury.

Accuracy and Limitations

Available data sources were analyzed and compared carefully and sorted by dates, ages, and other variables. The researcher endeavored to obtain the necessary data as accurately as possible and to determine what inaccuracies were present. Statistical analysis was implemented repeatedly to validate quality of findings.

To reduce possible biases, the researcher limited literature review and data sources to those from peer-reviewed research articles and reports available from national government of Mongolia, Canadian statistics and other reliable data sources.

The foremost methodological constraint was the lack of comparable age-range data for the Mongolian child labour statistics (age 5-17) to Canada (for which only age 15-24 years were available, generally in aggregate). These data, with different age groupings of children, might affect the validity of data comparison between the two countries. The value of existing data on child labour from the two countries' reports and databases were not comparable because Canada did not have appear to have any published reports of child labour below age 15.

Child labour-related injuries may be underreported to, or undetected by, national authorities, and some of the causes for those which were reported may be unknown. Due to reporting bias, it may have been most difficult to access the injury data that identified the most hazardous forms of child labour and their causes. Complete child labour-related injury data are often difficult to obtain, as reporting may explicitly or tacitly imply illegal practices. Thus, the resulting limitations on reports of child labour injuries may have impacted the completeness of this research.

<u>Chapter Three</u>. Background: Mongolian and Canadian statistics about child labourrelated injuries

Background of child labour and injury in Mongolian children

A child labour survey from the Mongolian National Statistical Office (MNS, 2008) reported that of all 621,612 children aged 5-17 years living in Mongolia during 2006 -2007, 11.5% (71,339) were engaged in work. In this report, number of working children aged 5-17 and work place characteristics are presented (Table 1). As summarized from this result, of all working children, 88.9% work in agricultural sector of Mongolia.

Table 1.

Number of Child labourers in different work places in 2006 - 2007 by age distribution

	Work places									
Age groups	Agriculture	Mining	Manufactures	Energy	Construction	Trade	Hotel & Restaurants	Transportation & communication	Others	Total
5-9	17466	0	39	0	110	383	108	0	22	18128
10-14	22447	390	70	0	296	1448	231	110	23	25015
15-17	23514	298	919	57	521	1820	494	218	355	28196
Total	63427	688	1028	57	927	3651	833	328	400	71339
Percent (%)	88.91	0.96	1.44	0.08	1.3	5,12	1.17	0.46	0.56	100

In figure 1, the largest single age category of working children was for age 15-17 years (39.5%). However, more numerous than those were the children working below legal age, ages 5-14 (60.4%).



Thus, of all working children aged 5-17 years, 60.4% were involved in underage child labour, as the majority of Mongolian child labourers were 14 years and younger. Of them, 39.7% were girls (24% age 5-9 years and 34.7% age 10-14 years) and 60.3% were boys (27.5% age 5-9 and 35.7% age 10-14 years). Thus, these child labourers' ages was more often 10-14 years than 5-9 years, but even these latter, young children accounted for one quarter of young laborers.

In Table 2, general background of all children's out-patient unintentional injury morbidity rates (227.0 -387.2) per 10,000 population aged 5-19 years, analyzed for national health indicators (2007-2009), were higher than adults (206.4 - 305.1 per 10,000). Injury, poisoning and certain other consequences of external causes was in the third place in 2007 and in the fourth place of leading causes of children's morbidity in 2008-2009 in Mongolia.

Table 2.

Leading morbidity causes in Mongolian children aged 5-19 years between 2007 and 2009 (per 10,000 population)

[2007				2008		2009		
_	5-9	10-14	15-19	5-9	10-14	15-19	5-9	10-14	15-19
Name of diseases	per 10000								
Diseases of respiratory system	1082.7	867.7	608.8	1061.2	806.7	596.0	1069.3	892.0	676.8
Diseases of digestive system	540.2	542.8	565.9	569.3	552.3	589.4	664.6	691.9	624.0
Infectious and parasitic diseases	330.6	189.3	159.5	356.4	224.0	212.9	206.3	122.7	156.7
Injury, poisoning and certain other consequences of external causes	227.0	281.3	371.6	240.9	283.5	387.2	249.6	309.7	366.1
Diseases of the skin and subcutaneous tissue	234.2	261.1	325.5	332.2	352.0	427.6	284.8	325.4	397.5

The number of children's injury cases under 15 years was lower than for 15 to 19 year old children in 2007-2009 (Figure 2). For children's injury overall, the frequency in children under 15 years was 13,253 (53.6%) in 2007, 13,310 (53.4%) in 2008, and 14,003 (57%) in 2009.


Moreover, the prevalence trend for injury in younger children, aged 5-14 years, showed that children's injuries increased over the three year period. In addition (Figure 3), fatal injury, poisoning and certain other consequences of external causes were first among children's principal three mortality causes during 2007 – 2009. Of the total Mongolian population (2,747,316), 32.5% were aged 5 to 19 years during those three years, while of all unintentional injury deaths (6,142) in Mongolia, 11.1% occurred among children aged 5-19 years in 2007-2009. Of those children's injury deaths, 48.5% were among younger children aged 5-14 years.



This national injury report showed that injury is the main cause of children's hospitalization and death in Mongolia. Particularly, outpatient injury and injury-related deaths were commonly distributed in younger children aged 5-14. Thus, children under 15 years suffered frequently from injury consequences. The recorded causes of all injuries were traffic (33.8%), drowning (14.1%), falls (12%), weather disaster (14%), and all other (26.1) during 2007-2009 (Mongolian Health Statistics, 2008-2010).

This data showed that traffic- and swimming-related injuries were common; although falls and harsh weather related injury prevalence occurred commonly in children aged 5-19 years in Mongolia. Thus, children were a high risk group for injury.

In regards to a national injury report on children aged 5-19 in Table 3, the most common injury types were bone fracture and head injuries. Not only young children, aged 5-14 years, were affected by this type of injury. For example, among injured 5-14 year-old children, 15.9-19.9% sustained head injuries, 74.4-78.2% bone fractures; while these rates were 15.39 – 20.78% and 71.5-74.5% among 15-19 years old children.

Table 3.

	2007 year			2008 year			2009 year		
	5-9	10-14	15-19	5-9	10-14	15-19	5-9	10-14	15-19
Name of diseases	Number/ %	Number/ %	Number/ %	Number/ %	Numb er/ %	Numb er/ %	Number /%	Number/ %	Number/ %
Head injuries	941	1264	2381	897	1056	2310	988	1259	2191
	16.69%	16.6%	20.78%	15.39%	14.1%	19.9%	16.2%	15.90%	20.71%
Eye injuries	42	50	62	46	35	76	49	62	70
	0.75%	0.66%	0.54%	0.79%	0.47%	0.65%	0.8%	0.78%	0.66%

Types of injuries in children aged 5-19 years between 2007 and 2009 in Mongolia (by number/percentage)

Various types of bone	4103	5667	8198	4311	5853	8650	4500	6154	7620
fractures	72.79%	74.41%	71.54%	73.97%	78.2%	74.5%	74.0%	77.71%	72.02%
Foreign	27	22	37	35	31	60	28	50	61
	0.48%	0.29%	0.32%	0.60%	0.41%	0.52%	0.5%	0.63%	0.58%
	309	259	274	399	248	289	366	215	276
Burning	5.48%	3.40%	2.39%	6.85%	3.31%	2.49%	6.0%	2.71%	2.61%
Exposure and	29	78	165	35	60	143	32	36	134
poisoning (chemical, drug, etc)	0.51%	1.02%	1.44%	0.60%	0.8%	1.23%	0.5%	0.45%	1.27%
	186	276	343	105	199	83	121	143	228
Others	3.30%	3.62%	2.99%	1.80%	2.66%	0.71%	2.0%	1.81%	2.16%
	100%	100%	100%	100%	100%	100%	100%	100%	100%
	5637	7616	11460	5828	7482	11611	6084	7919	10580

This analysis showed younger children under age 15 had similar or only slightly lower risk to that of older children for bone fractures and head injuries.

According to the report from the National Disaster Agency (2010), 50 cases of occupational fatal injuries in industrial sectors excluding animal husbandry sector and 139 injury deaths due to harsh weather disasters in rural herders were registered during 2007-2009 in Mongolia. They reported that of all 52 fatal injury death cases in herders in 2008, 14 (27%) were children and of all 18 fatal injury deaths in 2009, 6 (33.3%) were in children. The cause of these deaths was harsh weather conditions including snow, wind, rainstorm and lightning strikes. It showed how much herders' work met difficulties. Thus, fatal injury occurs with unfortunate frequency in child labourers in animal husbandry sector.

Children's work and injury in Canada

Of all employed youth aged 15 and over, 75.1% were non-students in Canada. Of all employed non-students, 77.6%, and of employed students, 96.3%, worked in service industries in 2009-2010 (Statistics Canada, 2010). Of all Canadian youth aged 15 years and over, 61.8 -63.6% were involved in work in 2007-2009. One of the most common employments was in agriculture: many Canadian youth work on farms. For example, in the labour survey, of all farm workers, approximately 1.8% were children aged 15 years and 2.3% were children aged 16-17 years in 2001 (Statistics Canada, 2011).

According to the labour force survey report, average weekly hours of the students were 16.2 in 2007-2009. According to the census report, of all workers in Canada 0.3% (51,265) youth aged older than 15 had unpaid family work and youth aged 15-24 years were more likely (4.7 times higher) to spend their time for unpaid child care in 2006. Their hours spent on it were 4.7 times higher than spending hours for unpaid housework (Statistics Canada, 2008).

According to Canadian statistics, unintentional injury was one of ten leading causes of death in Canadians in 2007-2009 and unintentional injury of children aged ≤ 14 years was a main cause (29%) of all deaths in 2007 (Statistics Canada, 2010). Moreover, in Canadian statistics, of all national injury cases, 21.3% were children's injury aged 12-19 years in 2009. These injury rates increased every year from 2001 through 2009. Of the most serious injury cases in children aged 12-19 years, 66.1% were due to sports, 3.5% due to household chores, and 3.8% due to workplace accidents in 2009-2010 in Canada (Statistics Canada, 2011).

Comparison of general background of children's injury between Mongolia and Canada

All-injury rates in the overall population were 28.5 per 100,000 population in Canada and 55.7 per 100,000 in Mongolia in 2008 (WHO, 2010). Thus, incidence of all unintentional injury was nearly 2 times higher in Mongolian population than in Canadian population.

General data for all children's hospitalized injury and deaths were reported by the same age groups: 5-9; 10-14 and 15-19 in both countries. In figure 5, 18.7% of all inpatient injury cases and 8.3% of all injury deaths were registered in children aged 5-19 years in Mongolia, while 12.6% (injury cases) and 7.9% (death) occurred in Canadian children aged 5-19 years during 2007-2008 (Mongolian Health Statistics, 2008/2009 & CIHI, 2008/2009). Those rates were, respectively, 17.1 % and 8.1% in Mongolia; 11.4% and 7.3 in Canada during 2008-2009.



Unintentional injury was the main cause of children's illness and death in both Mongolia and Canada. The proportions of inpatient injury prevalence and death were higher in children of Mongolia than in those of Canada, although these indicators decreased slightly in both countries over a two year period. Of their respective overall populations, 18.9% were children aged 5 to 14 years in Mongolia vs. 10.7% in Canada in 2007-2009. Interestingly, in comparison of young children's injury between both countries, the rates of hospitalized and dead young children aged 5-14 years due to injury were higher in Mongolia than in Canada. For example, of all (24,713 in Mongolia and 1,287 in Canada) injured children aged 5-19 years, 53.6% (13,253) were children under 15 years old in Mongolia but only 29.8% (384) in Canada in 2007-2008.

Of all deaths due to injury in children aged 5-19 years, 54.9% were children under 15 years in Mongolia vs. 23.5% in Canada. Thus, younger children's fatal and non-fatal injury is a critical health problem in Mongolia. Mongolian children's all-injury number is 19.2 times higher than that of Canadian children. Moreover, it has been reported that 10.9% of hospitalized injuries in youth aged 15-24 were due to sport and only 3.6% due to work in Ontario Province, Canada (Ontario Trauma Registry, 2011). In a Mongolian self-reported random study of injured male youth aged 15-24, only 14.9% were due to sport and 32.5% due to work (Public Health Institute, 2011). These data indicate that youth may be more likely to suffer injury while working in Mongolia than in Canada. Child labour may contribute to injury related challenges in Mongolia. According to the Canadian statistics, child labour is not reported in Canada. Thus, child labour in Mongolia became the primary focus in the following portion of this research project.

Chapter Four. Child labour related injury

Work environment for child labourers of Mongolia

A national child labour survey in Mongolia identified 71330 child labourers, of whom nearly 60% were children aged 5-11 years and 67.3% were working in hazardous conditions, such as mining and other dusty and unhealthy conditions. In figure 6, of those engaged as child labourers, 80.7% had worked in mixed conditions including without work permission, work for long hours more than 43 hours, and in other unhealthy work environments.



Figure 6. Hazardous work in child labourers aged 5 to 17 years in Mongolia, 2007

Of 71,330 Mongolian child labourers, 67.5% have work experience of less than 1 year, 11.2% of 1-2 years, 10.5% of 3-4 years, 8.5% of 5-9 years, and 2.3% of 10 and more than 10 years. Of young children under 15 years, 81.4% had worked for less than 1 year (MNS, 2008). Most children had little work experience. Thus, limited work experience could also be a risk

^{*&}lt;sup>1</sup> Mixed conditions including working without permission, working \geq 43 hours, and unhealthy work

environment

factor for injury, not only in young children aged 5-14 years, but also in children age 15 and older.

Working long hours was a common problem predisposing to injury in child labourers.

For example, according to child labour survey report, 20.8% of child labourers had worked with prolonged hours (\leq 43hours) per week. Interestingly, in this report, average hours per week of all working children were 46.4 for paid work and 22.0 for unpaid and selfemployed work. Thus, children were more likely to work longer in paid work than in unpaid work. Children from low income families often indicated that they worked longer hours.

All 165 (0.24% of 69,678 weekly child labourers) injury cases were reported (Figure 7). 80.6% of them were children aged 15-17 and 93.9% were boys. In this survey report, of all child labourers who required medical care, 94% had prior history of injuries (Mongolian Statistical Office-MNS, 2008).



Older children, particularly boys, suffered the majority of injuries, possibly because they were engaged more frequently in child labour and unsafe work.

Child labour-related injury in nomadic herder children of Mongolia

In a report from the Ministry of Social Welfare and Labour of Mongolia and the Ministry of Food and Agriculture in cooperation with ILO and Mongolian Association of Animal Health and Livestock Marketing (MSWL et al., 2009), of 263 herder children who were included in a survey of seven representative provinces of Mongolia in 2008, 77% were boys and 23% were girls aged 9-18 years. 43.7% of them were without formal schooling, 33.9% were included in distance education and only 22.4% attended school. Of these herder children, 88.9% (234) were 13-18 years old and 77.0% (180) of those were without formal schooling. It is clear that children without formal schooling and with distance education were involved with child labour. Moreover, 48.2% of those herder children started their animal husbandry work when they were 7-8 years old. As illustrated in figure 8, 50% of children aged 15-18 years, and 43.3% of children aged 13-14, had worked 9-12 hours per day and 55% of children aged 11-12, and 60% of children aged 9-10 had worked 5-8 hours a day.



Thus, working early and long hours was a chronic challenge for nomadic child labourers. In addition, of herder children, 18% encountered hunger, cold and anxiety while working (MSWL et al., 2009). These challenges may predispose these young workers to injury. In table 4, data for 113 injury frequencies among injured nomadic herder children are presented: 99.1% of them were aged 9-17 and 83.2% were boys. The longer hours in combination with hunger and exposure to animals may result in overwork-related fatigue and stress, contributing to the risk of injuries.

Items		Coding	Injury frequency (N=113)
	9-10	9,5	1(0.9%)
1 99	11-12	11,5	2(1.8%)
Age	13-14	13,5	44 (38.9%)
	15-17	16	66 (58.4%)
Sav	Male	0	94 (83.2%)
Sex	Female	1	19 (16.8%)
	Horse racing/riding	1	36 (31.9%)
	Herd animals	2	12 (10.6%)
T	Home work	3	16 (14.2%)
l ype of work	Chores for animal		
	care	4	35 (31%)
	Lambing sheep and		
	birth animals	5	14 (12.3%)
	Head/neck	1	22 (19.5%)
	Bone broken	2	19 (16.8%)
Injung tung	Minor	3	8 (7.1%)
injury type	Cutting	4	5 (4.3%)
	Burning	5	15 (13.3%)
	Frostbite	6	9 (8.0%)
Illness	Zoonosis infection		
miless	(brucellosis)	7	35 (31.0%)

Table 4. Child labourers' animal husbandry work, age and gender distributions associated with frequency of injury/illness in nomadic herder children of Mongolia (N=113)

This analysis showed (Table 4) that of injured and ill nomadic herder children who had prior history of injury, 19.5 % had suffered from serious head/neck injury, 16.8% from bone fractures, 13.3% from burning, 7.1% from minor injury (finger and toe injuries), 8.0% from frostbite, 4.3% from cutting, and 31.0% from zoonotic infection as brucellosis. In regards to this result, of injured/ill herder children, 83.2% were injured boys, although, both sexes did suffer injury. It indicated that older boys were injured more than girls (variable was coded: male-0; female-1).

A report from National Disaster Research Institute (2010) emphasized weather disaster as a risk factor for fatal injury in rural population and herders. They found that herder people are at risk to suffer fatal injury in settings characterized by outdoor harsh work during a natural disaster such as storms or extreme cold. However, the report indicated that non-fatal injury cases in herder children were often underreported. For example, in reality frostbite due to cold winter conditions may often be unreported. This report detected it only through prior history interview of injury in herder children.

According to this self-reported injury exposure, of all 263 herder children, 64 (24.2%) children had prior history of health and work consequences: 39.1% of those had sustained an injury and work-related illness (MSWL et al., 2009). Therefore, nomadic herder children had injuries while doing multiple chores in animal husbandry work. For example, 113 injuries while completing the most common 7 types of chores were reported among 25 herder children. Thus, one herder child may have potential risk while performing each of a minimum of 4 different types of daily chores, to experience multiple and repeated injuries. With these issues, the researcher tested the following hypothesis: that horse riding was associated with injury.

To answer these questions the researcher analyzed categorical data using a Chi square statistical test. The results showed that horse riding was significantly associated with head/neck and bone broken injury, X^2 (24) =304.92, p<0.05, through fall-related injury mechanism, X^2 (20) =113.03, p<0.05. Injury types were dependent on injury mechanism, x^2 (30) = 114.55, p<0.05. With regard to these findings, the null hypothesis of independence was rejected and research hypothesis was retained. Thus, children's injury depended on their work type. However, these results indicated that nomadic children's injuries are not dependent on their age and gender differences, X^2 (18) =20.05; X^2 (6) =6.729, p>0.05; injury mechanism is not significantly associated with children's age group distribution, x^2 (15) = 21.69, p>0.05.

Table 5a

Association between head / neck injury and horse riding in Mongolian nomadic herder children, 2008

		Work s		
	Variables		No horse	
	·	Horse riding	riding	Total
Head &	Observed	19	3	22
neck injury	Expected	7.0	15.0	22.0
No head &	Observed	17	74	91
neck injury	Expected	29.0	62.0	91.0
Total	Observed	36	77	113
	Expected	36.0	77.0	113.0

Table 5b

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	37.385°	1	.000		
Continuity Correction ^b	34.332	1	.000		
Likelihood Ratio	36.259	1	.000		

Fisher's Exact Test				.000	.000
Linear-by-Linear Association	37.054	1	.000		
N of Valid Cases	113				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.01.

b. Computed only for a 2x2 table

In Chi square test analysis (Table 5a,b), herder children's head and neck injuries were significantly associated with the horse riding aspects of animal husbandry work, $x^2(18) = 37.385$, p>0.05.

Head/neck injury and bone fractures were 34.5% of all 113 injury frequencies and were strongly associated with children's riding horses while herding animals (p<0.05). It showed that nomadic herder children's very challenging horse riding may have increased the risk of these serious injuries.

Moreover, herder children's head and neck injuries and broken bones were associated with riding horses and herding animals; minor injuries associated with chores for animal care; cuts with home chores and chores for animal care, burns with home chores, frostbite with herd animals; and zoonotic infection with the chores required for animal care and lambing.

Thus, nomadic herder children who were riding horses and herding animals were more likely to suffer from head/neck injuries and broken bones, and children who were working for lambing sheep and animal husbandry chores were more likely to get zoonotic infection.

Non-fatal injuries sustained by children were most commonly (brain) concussions, scrapes, and frostbite (to the face, ears, fingers, hands and legs).

In this result, it is notable that of injured nomadic herder children who had contact with infected animals, 31% (35) suffered from brucellosis infections acquired while assisting with lambing and other animal births. For example, the national survey report (MSWL et al., 2009), of herder children who had prior history of injury, 10% were working in settings with infected animals, 16.8% with cuts to their skin, 18% carrying heavy loads and water, 36% with dusty conditions during cleaning polluted animal camps. Also, many young workers reported odor, hazardous waste, carrying water long distances for animals, horse racing, cutting animal wools and working in dust windy conditions.

Thus, many animal husbandry chores were difficult and hazardous for children. Child labour-related injuries among nomadic herder children depended on job-specific exposures.

The Chi Square analysis of Independence indicated that falls were more likely related to horse racing and riding horses (p < 0.05).

Thus, the main cause of herder children's injury may be falls from horses, animals and other fall related risk conditions. Children's work required horse riding for 74.4% of tasks in herding and caring animals.

Children's horse riding while herding animals may significantly increase the likelihood of herder children sustaining fatal injuries. Therefore, herder children's job hazards appear to be an essential factor for child labour related injury.

In addition, the strength of association between injury and horse riding was expected to clarify potential challenges of horse riding exposure to injury consequences.

In Table 6, head/neck injury is 15.8 times more common in horse riders than in nonriders, OR=15.83, 95%CI=4.315 - 58.09, p<0.05.

Table 6

Comparison of fall-related injury between horse riders and non-horse riders among nomadic herder children in Mongolia (N=113), 2008²

Variable	ORs	95% CI	p-value
Head/neck injury in horse	15.83	4.315 - 58.09	P<0.0001
riders comparison with non-riders			
Falls in horse riders comparison with	7.26	3.122 - 16.89	P<0.0001
non-riders			

Therefore, fall-related injury is 7.2 times more likely in horse riders than in non-horse riders among nomadic herder children, OR=7.26, 95%CI=3.122 - 16.89, p<0.05. To assess whether children's young age increases vulnerability when children involved with horse riding, $a X^2$ test was conducted, and was significant. Horse-riding was significantly associated with children's young age, X^2 (12) =37.99, p<a 0.05. Children are unsafe when they were working and their age seems to be one of the main factors in these child injuries. These results answered the research questions in the following way: Child labour contributed to the children's injury. Particularly, the most common injury type associated with riding horses among herder nomadic child labourers was head and neck injury. According to the analysis (Table 7) of a self-reported survey of rural district hospital, Alag-Erdene district in Khuvsgul province of Mongolia (Alagerdene, 2011), there were 43 injury cases reported in

² As the numbers involved are quite small (per Table 5a), with one of the cells with n=3, the confidence interval (CI) is broad. However, the OR does have a high p-value, and therefore seems unlikely to have occurred solely by chance.

nomadic herder child labourers in 2008-2009: 60.4% of them occurred in young children aged

7-10 years and 60.5% were boys.

Table 7

Nomadic child labourers' animal husbandry work type, age and gender distributions associated with injury in rural hospital-Alagerdene, Mongolia(N=43)

Items		Coding	Injury frequency (N=43)
	5-7	5,6, 7	8 (18.6%)
Age	8-10	8, 9,10	22 (51.2%)
	11-13	11, 12,13	6 (13.9%)
	14-16	14,15,16	7 (16.3%)
Sex	Male	0	26 (60.5%)
	Female	1	17 (39.5%)
	Horse riding	1	15 (34.9%)
	Herd animals	2	13 (30.2%)
Work time	Home work	3	4 (9.3%)
w ork type	Chores for animal care	4	4 (9.3%)
	Other	5	7 (16.3%)
	Head	1	18 (41.9%)
	Bone broken	2	5 (11.5%)
Injury types	Fractures	3	16 (37.2%)
	Cutting	4	2 (4.7%)
	Others	5	2 (4.7%)
	Falls	1	38 (88.4%)
Injury mechanism	Cutting	2	1 (2.3%)
mjury meenamsm	Animal attack	3	3 (7.0%)
	Others	4	1 (2.3%)

This result showed that of all injured children, 88.4% had prior history due to injury mechanism such as falls from horses and motorcycles while herding animals and 79.1% were reported with head, neck, spine injuries, broken bone and fractures including face, hands, arms, feet, fingers and toes.

In the resulting Chi-square test analysis for this survey from district hospital, horse riding and herding animals were significantly associated with fall injuries, x^2 (12) =28.33, p<0.05 and children's age, x^2 (12) =25.04, p<0.05, but were not significantly associated with gender (p>0.05). There was a significant effect between fall-related injury mechanism and head/neck and minor injuries, x^2 (12) =29.99, p<0.05. Interestingly, fall-related injury mechanism was dependent on children's age, x^2 (12) =21.75, p<0.05. There was a evidence that children's age was an influential factor for children's injury through horse riding for animal husbandry work.

Nomadic children's horse riding still carried an increased risk in this result, most commonly among nomadic children aged 8-10 years working in horse racing and herding animals. These results also can provide the answers for research questions.

Psychological factors for child labourers in Mongolia

According to the analysis for the national report, of all 263 herder children, 66.7% (175) worked with psychologically difficult labour environments: 22.5% of them with unexpected weather disasters, 8.2% with animal attack and being blamed for lost animals, 10.4% with herding and caring for animals in an insecure place and unsafe work conditions, 33.1% working long hours (\geq 9 hours per day), 1.6% tiring from static work, and 24.2% while ill. Older children (age \geq 15 years) were more likely to work for a minimum of 9 hours and a maximum of 13 or more hours. Thus, nomadic herder children's animal husbandry work may continue longer. Long work hours may be an indirect risk factor for children's injuries.

These prolonged working hours and starting their work day early may contribute to the development of children's stress, and increase the risk of work-related injury among nomadic herder children.

In this self-reported interview survey (MSWL et al., 2009), the most difficult consequences were due to attack by angry animals and unexpected harsh weather conditions including rain and snow storms and high winds. Moreover, in analysis (Figure 9), of children aged 11-14 years, 58.1% and of children aged 15-17 years, 53.1% were vulnerable to suffer from these problems.



In relation to this report for nomadic herder children, rural children are more likely engaged in animal husbandry work in their own family's as well as non-relative's household animal farms. Their role was reported as assisting adults due to various reasons: to obtain work experience; shortages of family labour force; low level of family income; pressure from their parents, and personal demands and choices. These children tend not only to lose their formal school chances, but also their childhood's healthy physical and psychological conditions. Many, 30.4% (80) of 263 herder children, were working far from their home (without parents' support on site). They were more likely to suffer from the following psychotraumatic situations: frightened due to herding animal alone (18%), worried about having to pay for lost animals (18.2%), adult blame (4.5%), lonely from being without peer aged friends (4.5%), hunger and cold (18%), herding animals in place with wolves (1.2%) and falls from animals (9%). Herder children's psychological reactions to their work environment difficulties may also be manifested by physical symptoms. Among herder children, headache (22%), chest pain (5%), frequent colds (16%), fatigue (12.7%), bowel symptoms (3%), and epilepsy (3%) symptoms were experienced by 40 (15.2% of all) herder children reporting a prior history of illness. Moreover, psychological/cognitive symptoms (e.g., worrying and anxiety due to loss of animals and adult pressure), occurred among them. These may indicate stressrelated physical and cognitive symptoms. These health and environmental problems may lead them to low self-esteem and mental pressure-related stress.

Comparing all children who work away from parents to those who work away from parents in animal husbandry, anxiety due to animals lost was present in 8.2% of all (263) nomadic herder children and 12.7% in 80 nomadic herder children working away from parents (MSWL et al., 2009). Of these children who work in non-relative family's animal husbandry, 54.9% suffered from injuries while working without parents' on-site support.

In the Chi square test analysis (Table 8 a) of existing data of the national self- reported interview survey, children's psychological stress was significantly associated with a lack of parental presence, X^2 =14.304, df=2, p=0.001.

Table 8

Psychosocial factors		Physica tasks			
		Tired	Afraid	Bored	Total
With parents' support	Observed Expected Count	10 4.5	0 4.8	0 .6	10

Association between psychosocial factors and children's tasks in Mongolian herder children, 2008

Without parents' support	Observed Expected Count	19 24.5	31 26.2	4 3.4	54
Total	Count	29	31	4	64

This analysis also showed that nomadic children's psychological conditions were dependent on parents' support. In figure 10, children who were working with their parents at home were less likely to suffer from unhealthy physical and psychological states such as being tired, afraid, and bored. Children who work without parents' support were more likely to suffer from these psychological consequences.



Figure 10. Psychosocial factors in Mongolian herder children working at home and outside home, 2008

Thus, the nomadic herder children who work far from parents' support may be more likely to work at increased risk of stress and to suffer from psycho-traumatic experiences. These psycho-social factors may influence childhood perceptions and competence, potentially leading to chronic behavioral disorders. Nomadic herder children who worked with families and parents may work at reduced stress, perhaps because they could be more confident of their parents' support and care. In addition, daily work performance influencing injury risks included riding race horses, calving, herding, feeding, treating animals with chemicals and drugs, cutting animal wool, cleaning animal camps, and using heavy and power tools to prepare animal feed, all hazardous types of work. These hazardous exposures and multiple extra work pressures for herder children may place then at risk of suffering chronically from fatigue and stress.

Conceptual model

A conceptual model was designed based on assumptions using outputs of Chi square test for the following main exposure variables for risk of child labour-related injury:

Work specifics (work characteristics)– The most influential predictors, animal husbandry chores, include the following: riding race horses, calving, herding animals by horses and motorcycles, feeding, treating animals with chemicals and drugs, cutting animal wools, cleaning animal camps, and preparing animal feed. Nomadic herder children perform multiple numbers of chores per day in animal husbandry. The highest injury risks were found to be from falls from horses and contacts with infected animals. Multiple animal husbandry chores are the cause of those injuries. For example, riding horses is often combined with herding animals, training young horses, gathering animals to camps, participating in horse racing, etc. In the pilot survey report from district hospital of injury cases among the herder children, 65.1% were related to job specifics: riding horses and herding animals.

Age –Younger children may be at higher risk for injury, due to their less-developed work skills. Injuries are not distributed equally across all ages of child labourers. Injury frequency of herder children aged 15-17 was 1.4 times higher than of children aged 13-14 years.

Injury type and injury mechanism –Injury type depended on injury mechanism in injured herder children. There was a reciprocal relationship between work specifics and injury mechanism. For example, according to the self-reported pilot injury survey from district hospitals, of all injuries in herder children, 88.3% were caused by falls due to riding horses and herding animals, leading to head/neck and minor injuries (79.1% of the child injuries).

In this conceptual model (Figure, 11), child labour and injury in animal husbandry show direct and indirect connections between the different expected variables and injuries. Herder children's riding horses leads to risk of fall-related injury, as do children's conditions such as fear, boredom and worry may contribute indirectly to injury mechanism.



Major risk factors (direct)

Figure 11. Conceptual Model: Child labour related injury in nomadic herder children

Thus, animal husbandry work operations were the main risk factors which tended to increase injury frequency. Children's age characteristics were still influential factors associated with different injury mechanism. Finally, children's injury depended on injury mechanism related to multiple work and age characteristics. For example, herding animals combined with horse riding and animal care with long hours and without parents' support leads to develop stress, anxiety, fatigue and hunger in herder children due to their youth. In turn, these psychological and physical conditions may lead to falls from horses causing a high risk of head injury.

Workplace injury in Canadian children and youth

In regards to injury claim analysis (Work-SafeBC, 2011) of fatal claims for short and long term disability, 3.6% occurred in working youth aged \leq 19 years of age in BC of Canada in 2009. Of all claims in this age group, youth, 74.5% were in those who were working in trade and service sectors. Of all 1,825 injured youth with above ages, 67.4% overall were boys; of the serious injured youth among them, 66% were boys. Of all injured workers who sustained serious injury, 43% were injured due to overexertion and bodily motion and 13% due to falls. Of these serious injuries 19% were fracture, 22%-back strain and 35% other type of strain. Census reported that of all farmer families, 36.3% were working with 4-7 persons from one family (Statistics Canada, 2008). These data showed that working children such as young workers were at risk of workplace injury in Canada. For example, BC Injury Research and Prevention Unit reported (Figure, 12) that workplace injury was commonly claimed for working children under 14-16 year olds and older children were more likely injured than in younger children, 31% of these working children were injured with lacerations and 8% with fractures (Luke, 2009).



These data demonstrated that working children were vulnerable to suffering from workplace injury in Canada. Canadian researchers found that 8.7% of children aged 9-11 years and 29.8% of 12-14 years were working on farms in Alberta; among farm workrelated fatally injured under-20 year old youth, more than 18.1%; and of hospitalized youth, 25.1% were in children aged 5-14 years (Barnetson, 2009). Most (47.8%) of child head injuries in farms were among children younger than 15 years during 2001-2004 in report from Canadian Agricultural Injury Surveillance Program (CAISP, 2007). In the farm injury report from the government of Alberta, 15% of all farm injuries occurred among children under 17 years of old and 12.8% were in hired workers (FARM, 2009). In addition, it was mentioned that 1% of fatalities were in hired child workers (Alberta Agriculture and Rural Development-AARD, 2009 & Barnetson, 2009). It indicated that hired child labour may exist in Canada. Thus, child labour may be under-reported. Also, the Ontario Trauma Registry (2011) reported that of work related injuries which were hospitalized, 4.9% were children aged 5-14 years and 32 (8.0% of them children aged 5-9 years) were hospitalized during 2009-2010. Thus, data suggested that workplace serious injury cases may be more common in Canadian young children than generally reported. In addition, BC statistics (WorkSafeBC, 2011) reported that workplace injury cases in young workers aged 15-24 decreased by 37.3 percent in 2009

compared with 2007 and 2008, although fatal injury cases increased by 2 cases (50%) in 2009 and sharply decreased in 2010 by 4 cases (67%) compared with the previous year. Moreover, the serious injury rate was approximately 8.0 per 1,000 workers in male young workers aged 15-24 years and 2.5 were in female workers in BC in 2008. Thus, males were more likely than females to have suffered workplace injuries in Canada.

In a Mongolian national child labour survey report (MNS, 2008), 43.6% of all injured children received health care consultation, 17.1% were hospitalized and 39.3% had only home remedy care (p.74-75). Of all health care costs of children's illness and injuries, 73.9% were funded by their parents. According to self-reported injury survey in nomadic herder children, of injured children 40.9% received health care aid and 59.1% were not able to access medical treatment (MSWL et al., 2009). In a self-reported survey on prior history of injury in a rural hospital of Mongolia (Alagerdene, 2011), it was reported that 67.4% of herder children who had prior history of injury accessed health care: 46.5% of them were treated in outpatient care in rural and provincial hospitals and 9.3% were hospitalized. Although, 44.2% of injured children received non-medical treatment at their home through traditional care providers. In Canada, of injured children aged 12-19 years, 54.2% received medical treatment within 48 hours, 92.2% could access hospital, clinics and other health care units.

Canadian experience in youth employment and health promotion

With regard to some research findings, children are an at-risk population. Children aged less than 19 years old make up more than 40% of the total population in many developing countries. For example, such youth are only 22.6 % of the overall population in Canada, but 38.2% in 2010 in Mongolia (Statistics Canada, 2010 & MNS, 2010). Thus, they

form a major part of the population and are a potentially very large future generation of workers.

In comparison with Canada, unpaid employment rate is 49.1% and youth employment rate was 35.0% in Mongolia during 2008-2009 (MNS, 2009). The paid youth employment rate is lower and unpaid employment rate is higher in Mongolia than in Canada. Thus, Mongolian youth may be more likely to do unpaid work and child labour than Canadians. This shows that there is a need for opportunity-based policy for social-economic development in Mongolia.

The employment rate was 47% in full time students aged 15-24 during 2006-2007 in Canada. These rates decreased in 2008-2009 by 10% (Statistics Canada, 2010), although in comparison analysis of labour force characteristics, employment rate in children aged 15 and older increased by 15.3% in 2010. It was reported that the employment rate was 55.0% in Canadian youth aged 15-24 years in 2010 (HRSDC, 2011). It is interesting how Canada achieved well-paid youth employment. Canadian- youth-friendly policies and activities may have fostered these achievements.

Some researchers indicate that "youth unemployment rates are approximately twice as high as adult unemployment rates" (Blanchflower, 2001, p.6). Unemployed young children may become involved in child labour easily. Thus, youth employment intervention is powerful to improve children's work skills, experience in making decision and behavioral skills to avoid risks and consequences in workplaces (World Bank, 2010). A youth employment program, *Young Workers Zone* is intended to prevent workplace injuries based on training young workers through a safe work environment, and legislation (Butler-Jones, 2011). Moreover, "work place interventions can promote mental health and reduce the risk of

depression" (EU, 2008, p.6). Thus, the researcher would suggest that youth employment may be a powerful intervention point for health promotion, not only to improve youth mental and physical health conditions and to prevent unhealthy behavior such as smoking, drinking, drug abuse and others, but also to prevent child labour. In relation to this issue there are some questions that this research is intended to answer: How do theoretical issues of health promotion connect to practical settings to reduce child labour related injury? How to create opportunities to reduce child labour through proper health promotion practice in Mongolia?

According to Labour legislation from Human Resources and Social Development of Canada (HRSDC, 2006), Canadian youth employment laws cover children and youth aged 12 to 18 and dictate minimum age for various types of employment, where youth are permitted to work, how long and when they can work, and what working places are restricted. In British Columbia, the Ministry of Labour and Citizen's Services (MLCS, 2006) has developed guidelines for parents on how children aged from 12 through 15 can work safely, what their minimum wage is, and how to foster employer agreements with them through the Employment Standards Act. Another example, the Prince Edward Island (PEI) Provincial Legislative Council Office (2010), in framing their Youth Employment Act, considered authorization, inspection, and definition of youth employment in developing regulations for employers. It shows us that youth employment opportunities may be created through suitable legislation to provide life training and experience to prepare for work.

Legislative support may help indirectly to create youth-friendly and healthy environments. It may establish a fundamental requirement to implement proper health promotion activities in practice. Thus, if families and communities using proper rules and legislation can promote healthy lifestyles and provide a secure and multi-opportunity

environment for them, that may be beneficial for preventing youth's injuries, based on reduction of child labour.

Canadian Youth Employment Strategy, issued in 1997 by Government of Canada, is still important in setting the direction to reduce challenges around youth employment, how to connect a variety of open links, and where to get support (Service Canada, 2010). For example, Newfoundland and Labrador encourage local community-based research to implement youth-friendly projects and youth-centered social policies (PHAC, 2006). The Canadian government also issued a "Youth Employment Strategy" which is designed to help youth to develop their skills and careers, how to find a good job, how to be involved with summer work, etc. (Service Canada, 2010). Canada has plenty of experience with "family friendly" practices intended to encourage youth employment focusing on integrating home and workplace to improve young human resource practices and meet personal needs with part- and full- time work schedule options (Comfort, Johnson & Wallace, 2003, p.10&15).

Government agencies of Canada, in cooperation with communities, have initiated many programs including skills links, job banks, summer job funding, youth workforce development investment, summer work experience, etc. (Service Canada, 2010). In 2005, British Columbia developed the "Youth Friendly City" project (Ragan, 2005) and designed Child and Youth Friendly Planning in 2010 in cooperation with national governmental and international agencies (PHAC, 2010). These programs, if implemented, will integrate evidence-based policies from scientific and practical fields to extend child- and youthfriendly, healthy environments and opportunities establish youth capacity building and encourage youth's participation in team leadership activities (Ragan, 2005). For example, from these programs, a youth friendly city project could include self-sufficiency training, and

support homeless youth, based on local governmental and community support. These activities could help youth to improve their marketing skills and develop their independence. Moreover, a "youth friendly city"-based changing environment is designed to help foster some opportunities including employment, increased family income, proper education, suitable improved work opportunity communication and networks, accessibility to quality health care services and other benefits of mental, psychological and physical health development in all population including children, youth, and the elderly. Meeting these living standards encourages youth's natural inclination toward healthy workplace and future lifestyles. If this positive environment cannot be fostered, youth's natural inclinations may deteriorate, predisposing them more toward child labour-related health challenges.

Using specific risk factor-related interventions may be more powerful to reduce disadvantaged conditions of most parts of a population than just focusing on the at risk population (Frohlich& Poland, 2007). Canadian approaches of implementing youth-friendly and family-friendly programs appear to be very effective in reducing the health risk factor for child labour related injury, youth unemployment, and by providing broad opportunities for a large part of population.

Moreover, public policies are designed to reduce social inequalities, increase employment, improve education, living conditions, and to build healthy communities that can drive down health inequalities (Raphael, 2007).Health promoters and policy makers may need to adapt their approach for disadvantaged children and youth. In the second international conference on health promotion, held in Australia in1988, it was also emphasized that healthy working conditions are an important policy point of Health for All (WHO, 2009). Health promotion is a priority to support safe youth employment and reduce existing child

labour. Therefore, Mongolian health policy needs to focus on environmental changes to society, youth employment, workplace health promotion settings and marginalized child labourers.

Chapter Five: Conclusions

Injury is the third leading cause of all children's morbidity and it increased each successive year during 2007-2009. Moreover, children's injury was the primary cause of children's mortality in Mongolia. Fatal injuries were more common in younger children than in older ones.

Child labor is quite common in Mongolia. The report from Mongolian Statistical Office showed that a huge portion (three fourths- 3/4) of child labourers work in agricultural sector such as animal husbandry chores. Thus, child labourers who are working in animal husbandry are a group vulnerable to workplace injury risks. Analysis in this report was presented that one in ten (1/10) of nomadic herder children were injured due to their job characteristics. Particularly, herder children were at increased risk of serious injury including head/neck, broken bones and other minor injuries when they performed animal husbandry chores using horse riding and care animals. Older and younger herder children were more likely to suffer from injury, because they were more likely to be working in animal husbandry chores with longer working hours. Nomadic horse riders were more likely to suffer head/neck injury and bone broken due to falls from horses. The frequency of fall-related head/neck injuries was high in herder children. Child labourers involved in horse riding were at greater risk of fall-related injuries. Horse riding may be perceived as the main factor increasing the risk of herder children's injury in the animal husbandry sector. Horse riding is more likely to

require more concentration and efforts from children's work performance than other types of work. It is associated with serious injury cases among rural children.

Young age was significantly associated with falls from horse riding. Thus, children's age contributed (at least indirectly) to the risk of injuries.

One recurrent occupational challenge is unsafe work procedures. More than 50% of nomadic herder children work without protective clothes and tools. In Mongolian practice, herder children do not have the habit (custom) or ready access to wear helmets to herd animals while riding horses or wear single-use gloves to process lambing sheep and birth animals to reduce the characteristic risks of those tasks. Inadequate labour conditions of animal husbandry work include working long hours, overloading of multiple work tasks, frightening situations, and worrying circumstances which may influence fatigue (physically) and anxiety (psychologically), combine with work-related stress, may predispose these young child labourers to mental and physical injury.

Statistical analysis demonstrated that nomadic herder children were at increased risk of injuries with certain types of work. A major risk factor for children's injury is the characteristic activity of animal husbandry for child labourers, riding horses to herd animals. Interestingly, herding operations in Mongolia are augmenting or replacing horse-riding with motorcycles. Particular attention will be needed to training, proper equipment, and ageappropriateness of operating those machines will also be critical, as they may soon be equally as common as horses. Thus, nomadic herder children's falls related to head/neck injuries and broken bones have been predictable, but some may be preventable.

The work specifics, working duration and other indirect stress-related risks contributed to injury mechanisms leading to a high frequency of injuries. Herder children may perform multiple chores daily and thus experience frequent injuries.

The associations among multiple direct (work and age characteristics) and indirect (working hours, early working, social-economic, physical and psychological factors) risk factors in the proposed conceptual model may contribute to develop injury mechanisms which were causes of different types of injuries in nomadic child labourers.

A high number of injury cases and deaths in young children and young workers were commonly reported in Canadian farming during 2007-2009. In Canadian research, Barnetson's study results and the report from AARD, hired child labour may exist in some provinces such as Alberta, Ontario of Canada. Thus, it may be underreported. However, child labour is not often reported in Canada. Most importantly, fatal and non-fatal injury cases were quite commonly reported in Canadian young workers. This may be partially due to the existence of a well-organized system of injury claim reporting in Canada. However, Canadians may need to be more aware of children's work to successfully prevent injury in children and youth.

Children's injury-related morbidity and mortality are the main causes of all children's deaths in both countries. Injury incidence in the overall population and hospitalization for injury in children were higher in Mongolia than in Canada. The main injury cause was sport-related consequences in Canada, while work related injury rates were higher in Mongolian youth. Inpatient injury cases in children aged 5-19, particularly in children aged 5-14 years, were more common in Mongolia than in Canada. Moreover, injured children had 2 times better access to medical care in Canada than in Mongolia. Thus, Canadian health care is more

accessible for injured children. It is also possible that this greater access improves surveillance for (reporting of) injuries, as well as outcomes.

Poverty, low family income and other economic challenges may contribute to existing child labour in Mongolia. Mongolian parents and children also often understand traditionally that children's working in animal husbandry is a lifestyle requirement and normal situation. Thus, to change their lifestyle environment and behavior is a potentially important approach to reduce child labour related health challenges such as injury. Improving the fundamental public health conditions of society may reduce child labour, leading to a decrease in child labourers' injury. Canadian experience with youth employment intervention shows that the most influential tool is to create safe and healthy environments for children. Moreover, Canada implemented health promotion actions including Healthy Cities, Youth Friendly City, Family Friendly practices, Youth Employment programs and other youth-supportive projects. Additionally, legislation manuals, laws, and guidelines were the fundamental basis and useful guide to reduce child labour-related injuries based on changing the youths' environment systematically and purposely. Youth may really want to work naturally, mentally and physically, and need suitable policies to support that. In reality, having education and a job are not only the youth's own demand but also human society's demand toward well-being to produce continuously healthy generations. The youth need social support, job skills, and work opportunities. Thus, youth employment is an important issue.

The researcher suggests that Canadian experience on youth employment will be a conceptual recommendation to avoid child labor consequences.

Finally, health promotion offers a variety of innovative programs, interventions and ideas. If we implement health promotion approaches to change behavior based on lifestyle,

social-economic and environmental improvement, child labour will be eliminated gradually. Therefore, a health promotion approach to change and improve environment may be the most important tool to reduce child labour-related injury.

Recommendations

Health promotion

Most importantly, reduction of underlying causes of child labour will likely result in reduced child labour related injury. In relation to this issue, is it possible a youth-friendly environment and other healthy setting programs will have sufficient influence to reduce the incidence of child labour-related injury? In answer to the question of why environmental and behavioral change approaches are determinants of child labour, the researcher would suggest that youth-friendly environment based society development, changing lifestyle and behavioral change in animal husbandry sector may bring improved labour conditions and concomitant changes in health indicators. Changing herder childrens' and parents' attitude may decrease child labour related workplace injuries and, consequently, decrease children's fatal injury rates. In relation to Boyce et al (2008), about youth injuries, the researcher would suggest that Canadian health promotion interventions to create supportive environments for children through "Youth Friendly environment" program and improve the quality of healthy workplace should be a priority for youth wellbeing in Mongolia. As a result, this could lead to the development of cost- effective and sustainable health practices.

Supportive environments are designed to improve long-term physical and psychological health outcomes based on improving psychosocial working environment, confident employment, safe ecology, secure community, improving quality of lifestyles, and minimizing behavioral problems among not only youth (≥15 years old), but also all children (<15 years old). This intervention is useful to all nations. Exchanging experiences with other countries may be beneficial to select more effective methods and compare the specifics of program implementations.

Occupational Health

Occupational, child and workplace health promotion are supportive actions to increase the likelihood tendency of youth employment settings to prevent workplace injuries, mental illness and other health challenges. There is a necessity to provide assistance, via professional inspection, measurement, assessment, and advice as well as adolescent and occupational health promotion approach from Mongolian labor authorities in cooperation with other agencies. Workplace health promotion may be effective in improving youth's safe work environments, and in reducing work related occupational chronic conditions. Protective clothes and helmets, workplace safety advice, and accessible health care for injury should become a priority in Mongolia. Wearing helmets for every procedure of riding horses by children during herding animals and necessary conditions and wearing impermeable gloves for every procedure of lambing sheep and animals are key protective tools in animal husbandry chores of Mongolia. Moreover, appropriate recommendations would be useful: adequate training for each task; proper protective equipment; and age-appropriate tasks.

Youth employment policy

Suitable legislation is important to help children to have adequate jobs and healthy working climate preventing childhood injury. Youth employment is one of the health promotion approaches to create a supportive environment for youth. It is a cost- effective and sustainable intervention for the future, to fundamentally address the social conditions toward healthy societies that influence the determinants of population health.

Canadians' support of these activities and policies which are focused on modern health promotion in improving the policy and practice for determinants of health will help to reach the achievement to improve youth opportunities and employment. It shows Mongolians how practical policy makers support the new health promotion approach and it is also useful in building supportive youth environments. Most importantly, creative work using this theoretical concept is needed to produce useful results. Therefore, if Mongolians were to adopt Canadian practices for youth employment basic conditions (labor legislation, employment standard, youth employment strategy,
and family friendly practices), that might help to substantially reduce the frequency of child labourrelated injury. Thus, these legislative opportunities would not only assist parents to support their youths' demands for adequate, remunerative, and meaningful work, but also encourage the implementation of proper policies to ensure that such activities are safe. Some emulation of the Canadian flexible and supportive legislative policy for youth employment could be very helpful in Mongolia, and could be implemented by a variety of approaches.

.

Bibliography

- Alberta Agriculture and Rural Development. (2009). Stakeholder consultation: Occupational health and safety. Retrieved from http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/aet13359/\$file/ohsnov2010-1.pdf.
- Alagerdene. (2011). Self-reported injury survey in 2008-2009. Rural hospital-Alagerdene district, Khuvsgul province, Mongolia.
- Alem, A., Zergaw, B., Kebede, D., Araya, M., Desta, M., Muche, T., et al. (2006). Child labor and childhood behavioral and mental health problems in Ethiopia. *Ethiop.J. Health Dev*, 20(2), 119-125.
- Alicia, D.M. (2007). Kids, crime, and coercion: Child labour and exploitation in Nova Scotia's illegal economy. *Dissertation Review*. Acadia University (Canada): AAT MR31207, doi: 978-0-494-31207-0.
- Bagott, R. (2000). Health and safety at work. *Public Health: Policy and Politics* (2nd Ed),160-165. Macmillan Press.
- Barnetson, B. (2009). Narratives justifying unregulated child labour in agriculture. Journal of Rural and Community Development. ISSN: 1712-8277 (67-83).
- Blanchflower, D.G. (2001). What Can Be Done to Reduce the High Levels of Youth Joblessness in the World ? ILO: Conference on Employment and Social Protection. (p.1-54). Retrieved from http://www.cesifogroup.de/portal/page/portal/ifoContent/N/neucesifo/CONFERENCE S/SC_CONF_1999-2006/ESP_2001/PAPERS/ESP01-BLANCHFLOWER.PDF.
- Boyce, W., King, M., & Roche, J. (2008). Injury and physical trauma among Canadian youth. PHAC: *Healthy Settings for Young People in Canada*. <u>http://eng.jcsh-cces.ca/upload/Injury_ENG.pdf</u>.
- Brian, C., Chiu, H., & Blair, A. (2009). Pesticides, Chromosomal Aberrations, and Non-Hodgkin's Lymphoma: Interface of human health and agriculture. *Journal of Agro-Medicine*, (14) 2, 250-255.
- Butler-Jones, D. (2011). Report on the state of Public health in Canada. Public Health Agency of Canada. Retrieved from <u>http://www.phac-a</u>spc.gc.ca/cpho-acsp/index-eng.php.
- Canadian Agriculture Injury Surveillance Program. (2007). Fast Facts: Fatal injuries in children under 15. Retrieved from http://cair-sbac.ca/welcome-english.html.
- CDC, (2007).Definitions for WISQARS Nonfatal. Retrieved from http://www.cdc.gov/ncipc/wisqars/nonfatal/definitions.htm.

- CDC., & NIOSH (2009). Delivering on the Nation's Investment in Worker Safety and Health. Journal of Occupational Hazards in Home Healthcare, (125), 22-53.
- CIHI. (2008/2009). National trauma registry. Report, p. 32-70.
- CMHA, (2010). Mental Health for All. *Mental Health Week*. Retrieved from http://www.mentalhealthweek.ca/data/MentalHealthisEveryonesConcernFactSheet.pdf
- Comfort, D., Johnson, K., & Wallace, D. (2003). Part-time work and family-friendly practices in Canadian workplaces. Statistics Canada. *Catalogue*, (71)584-MIE, (p.3-68).
- Conway, G.A., et al. (1999). Alaska's model program for surveillance and prevention of occupational injury deaths. Public Health Reports, (114)6, 555-558. Oxford University Press.
- Cornelio, D. (2010). Preventing workplace injuries and illness. Awareness Session: Labor Occupational Safety and Health (LOSH) Program. Retrieved from http://www.losh.ucla.edu/woshtep/training/pdf/awareness_module_eng.pdf
- Crockett, L.J., & Peterson, A.C (1993).Health risks and opportunities for health promotion. Millstein, S.G, Peterson, A.C. & Nightingale, E.O, *Promoting the health of Adolescents*, (p.13-26). Oxford University Press.
- Canadian Tourism Human Resource Council. (2010). OECD Benchmark report on youth: Canada's youth labour market outperforms most OECD countries. Retrieved September 09, 2010, from http://cthrc.ca/en/member_area/member_news/oecd_benchmark_report_on_youth_can ada_s_youth_labour_market_outperforms_most_oecd_countries.aspx.
- Dolgorsuren, G. (2011). *Children's injuries in summer*. INET News release. Retrieved from: <u>http://www.inet.mn</u>.
- Dorman, P. (2008). Child labour, education and health: A review of the literature International Labour Office, *International Programme on the Elimination of Child Labour* (IPEC) - Geneva: ILO, 2009. ISBN: 978-92-2-121849-4, 1-45
- Douphrate, D.I., Rosecrance, J.C., Reynolds, S.J., Stallones, L., & Gilkey, D.P. (2009). Tractor-Related Injuries: An analysis of workers' compensation data. Interface of human health and agriculture. *Journal of Agro-Medicine*, (14) 2, 198-205.
- Edmonds, E. V., &Schady, N. (2011). Poverty Alleviation and Child Labor. American Economic Journal: Economic Policy. Final version. 4(1-34). Retrieved from <u>http://www.dartmouth.edu/~eedmonds/povallev.pdf</u>.

- Edmonds, E. V. (2008). Defining child labour: A review of the definitions of child labour in policy research. International Labour Office. International Programme on the Elimination of Child Labour (IPEC) Geneva: ILO, 2009. ISBN: 978-92-2-121862-3, 1-38
- European Commission. (2010). Youth and Segmentation in EU labour markets. EU, LFS. Survey Report on Employment in Europe, (p. 1-3). Retrieved from <u>http://ec.europa.eu/employment_social/eie/chap3-2_en.html</u>.
- FARM (2009). Alberta farm injury report. Retrieved from http://www1.agric.gov.ab.ca/\$department/deptdocs.nsf/all/aet13045.
- FAO., & ILO.(2010). Youth employment. *Food, Agricultural & Decent Work*. Retrieved from http://www.fao-ilo.org/fao-ilo-youth/en/.
- Frohlich, K. L., & Poland, B. (2007). Points of intervention in health promotion practice. In O'Neil, M., Pederson, A., Dupere, S., & Rootman, I (2nd Ed.), *Health Promotion in Canada: Critical Perspectives.* (p.46-56). Canadian Scholar's Press.
- Gosal & Company. (2011). Child labour injuries skyrocket in BC. News release. Retrieved from gosalandcompany.com/child-labour-injuries declaration/documents/publication /wcms_decl_fs_49_en.pdf.
- Graitcer, P.L., &Lerer, L.B. (1998). Child labor and health: Qualifying the global health impacts of child labour. *Education*. Washington, D.C: World Bank. Human Development Network,(pp. 2-26).
- Grandjean, Ph. (1999). Mercury risks: Controversy or just uncertainly? Public Health Reports, (114)6, 512-515. Oxford University Press.
- Guarcello, L., Lyon, S., &Rosati, F. (2004). Impact of Working Time on Children's Health. An Inter-Agency Research Cooperation Project. *Understanding Children's Work*. Retrieved from<u>www.ilo.org/ipecinfo/product/download.do?type=document&id</u>.
- Health Canada, (2007). Environmental and workplace health. Report of the Health Professionals and Children's Health and the Environment Workshop. Retrieved from: <u>http://www.hc-sc.gc.ca/ewh-</u> <u>semt/pubs/contaminants/childrens_workshop-enfants_atelier/index-eng.php</u>.
- Health and Safety Executive, (2010). *Stress-related and psychological disorders*. Retrieved from <u>http://www.hse.gov.uk/statistics/causdis/stress/scale.htm</u>.
- Healy, T., & Kerr, J. (2010).*IMAGINE that! A Population Health Primer for Northern Health.* Northern Health. Prince George, BC.
- Hemal, N.M. (2009, July 27). Child Labor: Spreading Disease. Retrieved from

http://www.ammado.com/community/108657/articles/9986.

- HER-net (Hellenic Resources Network). (2008). Convention on the Rights of the Child. Retrieved from http:// http://www.hri.org/docs/CRC89.html.
- Hobbs, S., McKechnie, J., &Lavalette, M. (1999). Child Labor: A world history companion. ISBN 0-87436-956-8. (p.xv-xx&238-240). California: ABC-CLIO, Inc.
- Human Resources and Social Development of Canada. (2011). Work-employment rate. Indicators of well being in Canada. Retrieved from www.rhdcc.gc.ca/.3ndic.1t.4r@-eng.
- ILO-Fact (2006, October). Violence against children at work. Fact Report. Retrieved from http://www.ilo.org/public/english/bureau/inf/download/child/childviolence.pdf.
- ILO, UNICEF & World Bank. (2009). Understanding children's work and youth employment outcomes in Mongolia. *Country report*, p.3-81.
- ILO- Report. (2006). The end of child labour: Making progress in combating child labour. *Report of International labour conference*.95th Session. (p.1-85).
- ILO. (2006, October).*Fact on child labour*. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---ed_norm/.
- ILO. (2006, October). Tacking hazardous child labour in agriculture. *Guidance on policy and practice. User guide.* ISBN: 92-2-118933-3. *Retrieved from http://www.ilo.org/wcmsp5/groups/public/---ed_protect.*
- ILO. (2007). Rooting out child labour from cocoa farms. A manual for training education practitioners: Ghana. (p.3-269). International program on the Elimination of Child Labour, Switzerland. ISBN: 978-92-2-119730-0
- ILO. (2011). Hazardous child labour. Retrieved from http://www.ilo.org/ipec/facts/Hazardouschildlabour/lang--en/index.htm.
- IPEC (2006). Child labour in gold mining: The problem. ILO: International Programme on the Elimination of Child Labour. Geneva. Retrieved from: <u>http://www.rimmrights.org/childmining/child_labour_in_gold_mining.htm</u>.

Legislative Council of PEI (2010). Youth Employment Act. Retrieved from www.gov.pe.ca

- Luke, H. (2009). What's happening to our children: A look at child-work related injury Claims for the past 10 years. BC Injury Research and Prevention Unit. Vancouver, BC. Retrieved from <u>www.injuryresearch.bc.ca</u>.
- Menendez, A. (2009). *The effect of globalization on poverty and child labor*. Conference Presentation. The University of Chicago.

- Michael, R. (2002). Workplace Stress and Injury the Latest Thinking. Retrieved, September 16, 2002, from <u>http://www.ergoweb.com/news/detail.cfm?id=595</u>.
- MLCS, (2006). Employment of young people: a guide for parents. Employment Standards Act and Regulation. (p. 2-4). Retrieved from <u>www.labour.gov.bc.ca/esb</u>
- Mongolian National Statistics [MNS], (2007).Health indicators. *Statistical Brochure*. (2), 20-23.
- Mongolian National Statistics (2008). Report of national child labour survey. Ulaanbaatar. National Statistical Office, Mongolia, p.1-93.
- MONEF. (2010). Contribution of Employers to eliminate the worst forms of child labour. News release. Retrieved from <u>http://www.monef.mn</u>.
- Mongolian Health Statistics (2008/2010). Report of Health Statistics. Department of Health Statistics. National Centre of Health Development, Mongolia.
- Mongolian Ministry of Social Welfare and Labour., et al. (2009). Report of fundamental survey for nomadic herder children. Brief Report (p.9-45).Erdenezul Press, Mongolia.
- National Disaster Research Institute. (2010). *Disaster report*, 2000-2009. National Disaster Agency of Mongolia.
- NIOSH, (1997). Child labor research needs. *NIOSH publication*. (97)143. Retrieved from www.cdc.gov/niosh/.
- Navch, T., Bolormaa, Ts., Enkhtsetseg, B., Khurelmaa, D., & Munkhjargal, B. (2006). Informal Gold Mining. Retrieved from: <u>http://www.unescap.org/stat/isie/reference-materials/Analysis-Country-Documents/Informal-gold-mining-MNG.pdf.</u>
- NBC (National Board of Children, Mongolia)., SC (Save the Children)., & UNICEF (2006). The living conditions of the children in peri-urban areas of Ulaanbaatar. *Summary Report, Mongolia.* Retrieved from <u>http://www.unicef.org/mongolia/LIVE.pdf</u>
- NCHR (National Committee for Human Rights)., & ILO. (2008). Child Labour-Worst Forms. *Final Report*. (1), 2-80.
- NCFH. (2009). *Child labor*. National Center for Farm worker Health, Inc. Retrieved from <u>www.ncfh.org</u>.
- NIOSH (1997). Recommendations from the NIOSH Child Labor Working Team NIOSH/monograph. Child Labor Research Needs, (97)143, 1-19.

- NIOSH, (2002). Occupational Safety and Health Risks. Work Organization and Stress-Related Disorders. Retrieved from <u>http://www.cdc.gov/niosh/programs/workorg/risks.html</u>.
- Norusis, M. (2011). IBM SPSS Statistics 19 Guide to Data Analysis. Software program. Retrieved from <u>http://www.goodreads.com/book/show/12883720-i</u>bm-spss-statistics-19-guide-to-data-analysis-with-cdrom
- Nutbeam, D. (1998). Health promotion glossary. *Health Promotion International*. Oxford University Press.Vol.13 (4), 350-355.
- Nyamtseren, L., & Nansalmaa, M. (2006). Mining. Pilot Survey Report, (1), 1-6.
- O'Brien, M. (1998). The impact of social and economic change of families and children. ISPCAN conference, Auckland. Massey University. Retrieved from <u>http://www.ariplex.com/economic myth busters/obrein.pdf</u>.
- Obua, P. (2004). Child labour in commercial agriculture in Uganda. Afr. Newsletter on Occup Health and Safety, 2004(14), 17-18.
- Ontario Trauma Registry. (2011). Report: Major Injury in Ontario, 2009-2010. Comprehensive Data Set. Canadian Institute for Health Information.
- Peden, M., Oyegbite, K., Smith, J.O., & Hyder, A.A. (2008). World report on child injury Prevention: Falls. ISBN: 978 92 4 156357 4, 101-110. WHO Press.
- PHAC, (2006). Youth engagement in social policy. Retrieved from www. phacaspc.ca/Canada/regions/atlantic/Publications/what.
- <u>Pickett, W., Dostaler, S., Craig, W., Janssen, I., Simpson, K., Shelley, S.D., & Boyce, W.F.</u> (2006). Associations between risk behavior and injury and the protective roles of social environments: an analysis of 7235 Canadian school children. *PubMed.* Queen's University.
- Pinder, L. (2007). The federal role in health promotion: under the radar. In O'Neil,
 M., Pederson, A., Dupere, S., & Rootman, I (2nd Ed.), *Health Promotion in Canada:* Critical Perspectives (p.92-101). Canadian Scholar's Press.
- Public Health Institute. (2011). Injury and Violence. *Report of fundamental research*, Mongolia. (pp.5-30).
- Ragan, D. (2005). The youth friendly city. The Environmental Youth Alliance. (p.3-89).
- Raphael, D. (2007). Addressing health inequalities in Canada: Little attention, inadequate action, limited success. In O'Neil, M., Pederson, A., Dupere, S., & Rootman, I (2nd Ed.), *Health Promotion in Canada: Critical Perspectives.* (p.106-116). Canadian Scholar's Press.

- Roman, P.M., & Blum, T.C. (2002, August). *The Workplace and Alcohol Problem Prevention.* National Institute of Health. Retrieved from <u>http://pubs.niaaa.nih.gov/publications/arh26-1/49-57.htm</u>.
- Rialp, V. (1993). Policy analysis: The role of advocacy. Children and hazardous work in the Philippines. Geneva: *ILO catalogue*. doi: 92-2-106474-3
- Secret, (2011). Protect childhood. Mongolian Children's National Assembly V. *Memorandum*. Retrieved from <u>www.secret.mn</u>.
- Schulz A., & Northbridge, M. (2004). Social Determinants of Health: Implications for Environmental Health Promotion. *Health Education and Behaviour*, 31, 455-471.
- Service Canada.(2010). Youth Employment Strategy Programs. http://www.servicecanada.gc.ca/eng/epb/yi/yep/newprog/yesprograms.shtml
- Siddiqi, A., Irwin, L. G., & Hertzman, C. (2007). Total environment assessment model for early child development. WHO: Evidence research on the social determinants of health. (p.11-17). Retrieved from www.who.int/entity/social.../ecd kn evidence report 2007.pdf.

Statistics Canada. (2008). Census data. Retrieved from www12.statcan.gc.ca.

- Statistics Canada. (2010/2011). Labour Force Survey, 2009-2011. Retrieved from www12.statcan.gc.ca.
- Statistics Canada. (2010). Activity when the most serious injury occurred, among people who sustained at least one activity-limiting injury during part 12 months, population aged 12 and over, 2009-2010. Retrieved from www12.statcan.gc.ca.
- Stromquist., et al. (2009). Challenges of conducting a large rural prospective population based Cohort study: the KEOKUK County Rural Health Study. *Journal Agro-medicine*, 14(2), 142-9. doi:10.1080/10599240902897535
- Teutsch, S.M., & Haddix, A.C. (1996). Decision analysis for public health. Haddix, A.C., Teutsch, S.M., Shaffer, P.A. & Dunet, D.O. Prevention Effectiveness. *Guidelines*, p.46-72. Oxford University Press.
- Tursz, A. (2000). Adolescents' risk-taking behavior. Mohan, D. & Tiwari, G. Injury Prevention and Control, 149-163. Great Britian: TJ International Ltd.
- Tsevelmaa, K., &Saijaa, N (2004).Formation of favorable Environment for Development, Training, Education and Information of Children in Mongolia. Brochure of Scientific Conference, p.101.

UNICEF. (2010, October 19). Child Labour. Retrieved from

http://www.unicef.org/protection/index childlabour.html.

- UNICEF. (2010). Statistics: Unite for Children. Retrieved from http://www.unicef.org/infobycountry/mongolia_statistics.html#81.
- WHO, (2009). The Bangkok Charter for Health Promotion in a Globalized World. Milestones in health promotion: Statements from global conferences. Retrieved from <u>http://www.who.int/healthpromotion/milestones/en/index.html</u>.
- WHO. (2010). Estimated deaths per 100,000 population, by cause, sex and Member State. Department of Measurement and Health Information. 2008. Retrieved from: <u>http://www.who.int/gho/mortality_burden_disease/global_burden_disease_death_estimates_sex_2008.xls</u>.
- Wieclaw, J., Agerbo, E., Mortensen, P.B., & Bonde, J.B. (2006, January 6). Risk of affective and stress related disorders among employees in human service professions. Occupational Environmental Medicine, (63), 314-319. doi: 10.1136/oem.2004.019398 Retrieved from <u>www.occenvmed.com</u>
- Windle, M. (2003). Alcohol Use Among Adolescents and Young Adults. Alcohol Research and Health. (Vol.27, pp.79-85).

WorkSafeBC. (2011). Claim analysis. Retrieved from www.workssafebc.com.

- WorkSafeBC. (2011). 18 young workers hurt each day. News room. Retrieved from www.workssafebc.ca/publications/reports/statistics_reports/assets/pdf/stats2009.pdf.
- World Bank. (2010). Active labor market program for youth. Employment Policy Primer: An Framework to Guide Youth Employment Interventions. (16). Retrieved from <u>http://siteresources.worldbank.org/INTLM/214578-</u> <u>1103128720951/22795057/EPPNoteNo16_Eng.pdf</u>.