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Project Sponsor: Canadian Agricultural Injury Surveillance Program

Project Director: Rob Brison, MD, MPH, FRCPC

Co-investigator: William Pickett, PhD

Project Coordination: Elizabeth Roland, BAH, MSc

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Ontario Ministry of Agriculture, Food and Rural Affairs
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The steering committee that designed this report:

Dr. Helen Ward, University of British Columbia
Tara Swanson, University of British Columbia
Anne DyBuncio, University of British Columbia
CAISP Collaborators (see below)

Individuals and agencies integral to the CAISP project:

British Columbia:

Dr. Helen Ward, Respiratory Division, Department of Medicine, University of British Columbia

Anne DyBuncio, University of British Columbia

Tej Sidhu, Chief Coroner's Office, Province of British Columbia

Dr. Shaun Peck, Deputy Provincial Health Officer, Ministry of Health and Ministry Responsible for Seniors

R.M. Strohmaier, Ministry Coordinator for Access to Linked Health Data Vital Statistics, Ministry of Health

Alberta:

Solomon Kyeremanteng, Alberta Agriculture Food and Rural Development, Farm Safety Program

Stella Lunseth, Alberta Centre for Injury Control and Research, University of Alberta

Lisa Hartling, Department of Paediatrics, University of Alberta

Saskatchewan:

Louise Hagel, Centre for Agricultural Medicine, University of Saskatchewan

Dr. Donna Rennie, Centre for Agricultural Medicine, University of Saskatchewan

Dr. Mary Rose Stang, Research Consultant Population Health Branch, Saskatchewan Health

Farm Safety Officer

Occupational Health and Safety Branch

Saskatchewan Labour

Chief Coroner's Office

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Manitoba:

Dr. Ted Redekop, Manitoba Department of Labour, Occupational Health Branch

Norma Alberg, Manitoba Department of Labour, Occupational Health Branch

Glen Blahey, Manitoba Department of Labour, Workplace Safety and Health Branch

Ontario:

Dr. Rob Brison, Department of Emergency Medicine, Queen's University

Dr. William Pickett, Faculty of Health Sciences, Queen's University

Quebec:

Dr. Louise Pare, Direction de la Sante Publique Chaudiere-Appalaches

Dr. Benoit Gingras, Direction de la Sante Publique Chaudiere-Appalaches

New Brunswick:

Dr. B. Christofer Balram, Director, Provincial Epidemiology Service, Provincial Epidemiologist, Department of Health and Community Services

Elizabeth Bastin, Department of Health and Community Services

Nova Scotia:

Dr. Judy Guernsey, Department of Community Health and Epidemiology, Dalhousie University

George MacKenzie, Chairman, Nova Scotia Farm Health and Safety Committee, Truro, Nova Scotia

Elisabeth Crouse, Nova Scotia Department of Agriculture and Marketing, Truro, Nova Scotia

Prince Edward Island:

Marilyn Affleck, P.E.I. Federation of Agriculture

Dr. Lamont Sweet, Department of Health and Social Services

Newfoundland:

Carolyn Crowley, NF & Labrador of Agriculture

National:

Jocelyn Rouleau, LCDC Health Canada

FOREWORD AND EXECUTIVE SUMMARY

FOREWORD

The participating members of the Canadian Agricultural Injury Surveillance Program (CAISP) are proud to present this report, Gender Analysis of Fatal and Hospitalized Farm Injuries in Canada, 1990-1996. This work has stemmed from the efforts of many individuals and groups. It is our sincere hope that this report and CAISP will continue to assist those who are working towards a reduction in the frequency and severity of farm injuries in Canada.

The objectives of this report are to describe gender differences in fatalities and hospitalizations in Canada, and to identify important patterns associated with these types of injuries. The report is written in a format that has been well received by farm safety specialists, farm operators, and other members of the Canadian agricultural community.

The surveillance data presented here contains basic information on the circumstances surrounding farm injuries that resulted in death or hospitalization, analyzed according to gender. A standardized data collection process was used in all provinces. As has been reported in other CAISP analyses, CAISP believes that farm machinery injuries are identified consistently in every Canadian province. However, because of inconsistent use of location of injury codes for non-machinery farm injuries, we believe that non-machinery injuries are under-reported in some provinces.

The analysis for this report was based on 708 fatal farm injury events and 8264 cases of hospitalization due to hospitalized farm-related injuries. The period of study included 1990-1996 calendar years for fatality data and the fiscals years of 1990-1994 for hospitalization data.

EXECUTIVE SUMMARY

HIGHLIGHTS

Work-Related Fatal Farm Injuries

1) The average annual number of fatal farm injuries identified was 101, with a yearly average of 76 male fatalities and 7 female fatalities. There were 11 times as many work-related fatal farm injuries for men as there were for women.

2) For males, 38% of fatal farm injuries were among those sixty years of age and older, in comparison to 12% for females. Children under age 10 accounted for 25% of female deaths compared to 7% of males.

3) For both genders, 71% of fatal farm injuries involved machinery.

4) Nearly half of the work-related fatal farm injuries to females and 40% of injuries to males occurred between July and September.

5) For both genders, 25% of injuries occurred while working in the field. More than half of those who were fatally injured died at the scene.

Fatal Farm Machinery Injuries

1) Of the 708 fatal farm injuries, 500 cases involved machinery, with an average male:female ratio also of 11:1.

2) For both genders, tractors were involved in just over 65% of fatal farm injuries.

3) The highest percentage of machinery-related injuries for males involved a machine rollover (32%) or runover (20%). For females the order was reversed, at 23% and 44% respectively.

Fatal Non-Machinery Injuries

1) Of the 708 fatal farm injuries, 208 cases had non-machinery causes, the average male:female ratio was also 11:1.

2) The highest percentage of non-machinery fatalities for males involved being struck by an object (24%) followed by animals and falls (14% each). For females, struck by and animal-related causes of injury accounted for 35% each of the total fatalities.

Hospitalized Farm Injuries

1) The total number of hospitalized farm injuries identified was 8263, leading to an average of 1653 per year (287 females and 1366 males). On average, there were 5 times as many work-related fatal farm injuries for men as there were for women. The sex ratio remained fairly constant by year.

2) For males, 24% of hospitalized farm injuries were among those sixty years of age and older, in comparison to 16% for females. Children under age 10 accounted for 12% of female hospitalization compared to 7% of males.

3) For males, 53% of hospitalized farm injuries involved machinery in comparison to 27% for females.

4) The most common diagnoses were fractures and lacerations for both males and females. Over age 60, fractures accounted for 52% of female injuries in comparison to 40% for males.

5) The upper extremity was the anatomical site with the highest male:female ratio (6:1); the lowest was the head (3:1).

Hospitalized Farm Machinery Injuries

1) Tractors were the most frequent type of machinery involved in hospitalizations for both genders (28%). For females, motor vehicles were the next most common machine type and for males it was a combine (9% for both).

2) For both genders, approximately half of machinery-related hospitalizations required a hospital stay of less than three days. The proportion of longer stays (over 6 days) was the same for both genders.

Hospitalized Non-Machinery Farm Injuries

1) For females, 48% of hospitalized farm injuries with non-machinery cause involved animals, compared to 34% for males. Of such cases, a horse was the most frequent animal involved for females (65%), whereas for males it was a cow (56%).

2) For both genders, the second most common cause of non-machinery farm injuries was falls (27% of females and 24% of males). For females age 60 and above, 48% of non-machinery hospitalized injuries were due to falls, compared to 31% of older men.

RECOMMENDATIONS

1) The report illustrates that fatalities and hospitalizations due to farm injuries have both common and distinct patterns when comparing males and females. These patterns can be applied for the refinement of existing prevention programs and in the creation of innovative approaches to prevention that take into account gender specific risks for injuries.

Males and females have the following patterns of injury in common:

a) Machinery, and particularly tractors, are the leading causes of death;
b) Seasonality and location of deaths are consistent between genders;
c) Diagnoses and lengths of hospital stay are also consistent;
d) Animals and falls are leading causes of hospitalization in both genders.

Differences between male and female injury patterns include:

e) Injuries to males strongly outnumber that of females for all types/mechanisms of farm injury;
f) Differences in the distribution of injuries by age: proportionality more older males and young females are injured;
g) The relative importance of rollovers as the mechanism of injury for males compared to runovers for females;
h) The higher percentage of older females having falls and fractures;
i) A greater proportion of females injured by horses

2) Explanations for the different patterns of injury may be attributed to gender differences in:

a) the size of the populations at risk
b) duration of agricultural work exposures
c) the nature of farm work assignments
d) biomechanical and ergonomical considerations
e) behaviours and risk avoidance
f) other unknown factors

Further scientific investigation of the causes for gender differences in farm injury is warranted.

3) Education and training programs:

a) for females, emphasis should be on safe handling and care of large animals, especially horses;
b) the hazards of operating farm machinery should be targeted to males, particularly those over age 60;
c) females should be made more aware of the potential for runover injuries from tractors;
d) youth organizations, such as 4-H clubs, are encouraged to emphasize that both boys and girls are at risk for farm injuries

CAISP should continue to strive to collect more complete and detailed data to better identify injury patterns relevant to males and females.

1.0 INTRODUCTION

This national report from the Canadian Agricultural Injury Surveillance Program describes gender differences and the occurrence of farm-related fatalities and hospitalizations in Canada within the period of 1990-1996. This type of information as well as information about many other aspects of our work is available on our website at: http://meds.queensu.ca/~emresrch/caisp/welcome-english.htm.

1.1 WHY IS IT IMPORTANT TO STUDY AND MONITOR GENDER DIFFERENCES IN FARM INJURIES IN CANADA?

The purpose of this report is to describe gender differences in fatal and hospitalized farm injuries in Canada. Its intent is to evaluate injury patterns that may reflect gender differences in physical aspects and in behavioural activities associated with the farming environment. As the role of women in farm activities is changing, it is important to monitor the nature and circumstances of gender-specific injuries in order to best determine appropriate prevention programs.

1.2 THE CANADIAN AGRICULTURAL INJURY SURVEILLANCE PROGRAM

The Canadian Agricultural Injury Surveillance Program (CAISP) is a national program funded by the Canadian Agriculture Safety Program (CASP). CAISP was funded as a pilot project in December 1995, and became a national CASP program in September 1996.

CAISP is a collaborative program run by organizations from across Canada. It is coordinated from a national office at Queen's University in Kingston, Ontario. The people and organizations that contribute to CAISP include representation from researchers, government agencies, and the agricultural industry.

The main purpose of CAISP is to collect and interpret information on agricultural injuries from across Canada. During the pilot phase of CAISP, national standards were developed for this process and representatives from each of the ten provinces were recruited. CAISP then created a national database of farm fatalities. The focus of the present report is on analyses from national databases that capture fatal and hospitalized farm injuries in Canada. It is our hope that the CAISP fatality and hospitalization databases will become important tools in the evaluation of these prevention programs.

1.3 OBJECTIVES OF CAISP

The objectives of CAISP are:

(1) **To develop a coordinated system for the assembly of national farm injury surveillance data.**

CAISP is working towards the goal of ensuring that its data are collected, compiled, and analyzed in a standard manner by all provinces.

(2) **To ensure that the collected information is interpreted and communicated in forms that are acceptable to potential data users in the agricultural industry.**

The CAISP collaborators are committed to ensuring that the data are disseminated in an appropriate and useful manner. Our primary audience is individuals within the agricultural industry who need to make informed decisions about safety programs and policy. This report is one attempt to make these data accessible to this audience.

1.4 WHY IS CAISP AN IMPORTANT INITIATIVE ?

CAISP is developing a surveillance system for Canada that will describe the occurrence and patterns of farm-related injuries at a higher level of detail than available previously.

It is our hope that CAISP will provide national information to assist in the development of priorities for health and safety programs, the development of strategies for the targeting of these initiatives, and the assessment of the effectiveness of prevention programs following their establishment.

While isolated regional farm injury surveillance initiatives have existed in some parts of the country, we feel that CAISP improves on these important initiatives in the following ways:

1) CAISP has worked towards the goal of ensuring that the data are collected, coded and disseminated in a standard manner across Canada. The collaborative approach is resulting in a more efficient use of resources to provide surveillance activities that are more productive and without duplication.

2) It is advantageous to pool data between provinces in order to increase the number of injuries on which to base analyses and from which to discern trends. The national dataset can be used to describe the farm injury problem across the country, and allows for comparisons.

3) The national approach has enabled the pooling of expertise in agricultural health from all regions of Canada. Some farm safety interventions and decisions may ultimately be made at a national level. It will therefore be useful to have these national data in order to provide an objective basis for decision making about these initiatives.

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2 METHODS

2.1 CONFIDENTIALITY AND CAISP DATA

2.1.1 Database Management

All data collected as part of the CAISP program are maintained in strict confidence. Personal identifiers such as the patients' names and social insurance numbers are removed by provincial authorities and replaced by identification numbers. All data are kept as computer files which are password protected and located in locked rooms. Documents pertaining to CAISP are kept in locked filing cabinets.

2.1.2 Identification of Individual Cases

All reports of patterns of injury contained in this report are based on analyses of group data only. No individual cases are presented. When analysis of the hospitalization data results in a group size of less than five cases, the results are aggregated to the "other" category.

2.2 OVERVIEW OF DATA SETS

2.2.1 Identification of Farm Fatalities

The process used in the identification of farm fatalities varies by province. What follows is a generic description of this process.

1. Potential sources of farm fatality data are identified. These sources are kept by a variety of agencies that vary by province. Examples of these agencies include: occupational health agencies, offices of the provincial coroner or chief medical examiner, departments of vital statistics, ministries of transportation, farm safety and police.
2. A comprehensive list of all potential, farm-related fatalities is assembled within each province. These lists draw upon each available source of fatalities.
3. Once cases are identified, detailed case reports are sought for review and data abstraction. The main sources of information are coroner's investigation reports; occupational safety and heath agency investigation reports; and RCMP/provincial police reports.
4. Data abstraction and entry are completed on each eligible fatality. This is done in a consistent manner using standard data abstraction forms (Appendix B) and a database program that has been developed centrally. Data abstraction is generally done on-site at the Provincial Chief Coroners' Office by reading and abstracting the relevant information from coroners' files. Data are then sent to the national site for further checking, verification and analysis.
5. A group of CAISP collaborators reviews each of the fatalities. Ineligible fatalities are excluded (Appendix C, Decision Rules for Inclusion/Exclusion of Cases). Of those that remain, the group categorizes each of the cases into two categories: a) work-related farm fatalities, and b) farm fatalities that were not necessarily work-related, but were caused by a hazard of the farm environment. The result is the final, national registry of farm fatalities.

2.2.2 Identification of Hospitalized Farm Injuries

CAISP maintains two data sets on hospitalized farm injuries: a basic and an enhanced data set. The process used in the identification of hospitalized farm injuries and collection of data varies by province. What follows is a generic description of this process.

1. Basic Data

Hospital discharge data are obtained from different sources in each province.

Farm machinery injuries are identified using a systematic computer search of these hospital separation databases where:

1) the primary external cause of injury (ICD-9 E-code) is

   (i) E919.0: *Injuries Caused by Agricultural Machines*;

or

   (ii) E849.1 (which indicates that the injury occurred on a farm)

and

2) an E-code identifying a machinery-related injury

are both listed simultaneously on the discharge record.

Non-machinery farm injuries are identified through a systematic search of hospital separation data where:

1) *(i)* the 5th digit of the external cause of injury (ICD-9 E-code) is 1 (indicating that the location of injury is a farm)

and

   (ii) the primary E-code is in the range of E850-869 or E880-928;

or

2) the accident location code indicates that the injury occurred on a farm and the E-code is other than 919.0.

The information obtained through this search constitutes CAISP's basic data set on hospitalized farm injuries. This data set includes: demographic information (eg. age, sex, province), information on diagnosis, hospital identifiers, chart numbers (except in Saskatchewan and in the Atlantic Provinces), and data on lengths of hospital stay and treatment. Enhanced data has been obtained from the following eight provinces: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick and Nova Scotia.

2. Enhanced Data

The patient identifier and institution code in the basic data set are used to identify:

1) individual cases

2) the institutions to which they were admitted.

The Chief Executive Officer (or equivalent) from each hospital is approached for permission to request chart data from their medical records department. Once granted, information is requested using a mail survey format. A standardized data abstraction form for each case is sent by mail to the medical records personnel at the appropriate institution (see Appendix B). Medical records personnel abstract specific information from the individual patient charts. Regular mail and telephone follow-ups are conducted following the initial mailing in order to ensure a high response. This process varies slightly by province.

The information from the computerized hospital record, combined with that returned from the mail survey abstraction form, constitutes the enhanced data set. This data set includes variables, in addition to those in the basic data set, which can be used to describe injury patterns. For example, there is information describing what happened to cause each of the injuries, and whether or not a tractor or agricultural machine was involved.

2.2.3 Case Identification and Data Retrieval

Enhanced Data

Cases identified in these provinces have been verified as farm injuries via the medical record search, and additional information about each case has been abstracted and compiled. Eight provinces were able to secure access to computerized, provincial hospital discharge records from their respective, provincial governments.

2.3 HOSPITAL ADMISSIONS: TRENDS AND PATTERNS

This CAISP report describes injuries associated with admissions to hospital. It is important to recognize that hospital admission practices in Canada may change over time, and this in itself may influence the patterns of injury that are observed.

2.4 APPROACH TO REPORTING

This report is organized into several sections. As discussed, CAISP currently has two different forms of data: basic and enhanced. Some sections rely on basic data only, others rely on the available enhanced data. The report has two main objectives: 1) to describe the gender differences in the farm injury and fatality problem in Canada, and within the provinces; and 2) to identify important patterns of injury leading to hospitalization or death. The report has been designed to be highly visual, with an emphasis on the graphical presentations of data and basic, descriptive statistics. Formal tests of statistical significance are not provided for most analyses.

2.5 DEFINITIONS

Farm. In the Census of Agriculture, Statistics Canada defined a farm as: any farm, ranch or other agricultural holding that produces at least one of the following agricultural products intended for sale: crops, livestock, poultry, animal products, greenhouse or nursery products, mushrooms, sod, honey or maple syrup products.

Farm Person. CAISP considers its study population to be all persons who either live or work on a Canadian farm.

Farm Injury Fatalities. CAISP defined a farm injury fatality as: any accidental injury resulting in death that: 1) occurred during activities related to the operation of a farm; and/or, 2) involved any hazard of a farm environment in Canada

Agricultural (Farm) Machinery Injury. Agricultural machinery injuries include cases admitted to a Canadian hospital, where the *International Classification of Diseases* external cause of injury (E-Code) was coded as E919.0, *Injuries Caused by Agricultural Machinery*. These cases are identified using E-Codes recorded on the hospital discharge record.

Non-Machinery Injury. Non-machinery farm injuries include those admitted to Canadian hospitals, where the International Classification of Diseases E-Code (or supplemental E-Code) for location of injury indicates that the injury occurred on a farm.

2.6 APPROACH TO ANALYSIS

2.6.1 Fatal and Hospitalized Farm Injuries

This analysis presents fatal and hospitalized farm injuries combined and separately. The patterns of injury observed for the leading mechanism of injury and age and sex distribution differed somewhat when the data were examined using these outcomes. These differences may be of importance in terms of identifying priorities for injury control.

2.6.2 Machinery and Non-Machinery Injuries

Both the fatal and hospitalized injury data indicated a pattern of injury analyzed according to gender differences between farm machinery related events and those that did not involve farm machinery. In order to facilitate the logical presentation of the data detailed analysis of each of these two major categories of injury was done.

2.6.3 Inclusion/Exclusion Criteria

CAISP has established a number of decision rules to help in judging whether or not to include specific types of injuries in the data set. The authors have applied these criteria to the data included in the analyses presented in this report. Please refer to Appendix C for a complete list of these rules

2.6.4 Calculation of Percentages

The percentages, which appear in the Tables and graphs, are based on valid results. The number of missing cases is noted below the Tables. Note that the percentages represent proportions within genders, and that the 100% total is for all males **or** all females.

2.6.5 Calculation of Rates

In this report, some rates of injury are provided. These describe ratios of the number of hospitalized farm injuries, to the number of persons at risk of experiencing a farm injury over a time period of interest (usually one year). Calculations of rates on a per capita basis allows the frequency of an outcome to be compared, after accounting for differences in population sized or period of study.

It is very important to recognize that the rates that are reported here are our best estimates. The best population information available in Canada to describe the persons at risk of experiencing a farm injury is population counts from the Canada Census of Agriculture and Population Census. These counts do not include hired workers, visitors to the farm, or some farmers who do not live on their farm. We suspect that some of the injured persons counted among those experiencing farm injuries are in these latter groups. The effect of including in the numerator persons who are not also counted in the denominator is that the estimated rate will be higher than the true rate.

2.7. DATA QUALITY/LIMITATIONS

2.7.1 Use of Calendar Versus Fiscal Year

Records of hospitalization data are kept according to fiscal years (April 1st to March 31$^{st)}$. Because our reporting is based on calendar year, the yearly data for some provinces are incomplete. Therefore analyses of hospitalization data are presented for fiscal years 1990-1994: this includes the first three months of 1995. Fatality data on the other hand, is complete for calendar years 1990-1996.

2.7.2 Length of Stay Analyses: Exclusion of Re-admission / Rehabilitation Cases

The present report focuses on acute cases of injury that result in hospitalization. Where possible, re-admissions to hospital for treatment of an injury, as well as cases treated in rehabilitation hospitals, are excluded. Exclusion of these cases was done to avoid inflating the injury counts by "double-counting" injury events. However, a limitation of this practice was that lengths of stay analyses would be biased downwards because the additional days in hospital associated with injury treatment and rehabilitation were excluded.

2.7.3 Identification of Cases Outside of the Established E-Code Protocol

Five of the provinces identify non-machinery farm injuries using the 'place of occurrence' code available as a fifth digit sub-classification in the ICD E-Code system. This fifth digit may be used, if desired, with E-Code categories in the ranges E850-E869, and also E880-E928. However, the range of codes which are excluded from this statement contain some E-Codes that may be associated with farm injuries.

Because our standardized search process was based on the range of E-Codes suggested by the 5th digit classification, these causes of injury have been excluded from hospital separation data contained in this report. They include hospitalizations that resulted from: 1) railway collisions; 2) some motor vehicle collisions; 3) transport accidents that do not involve vehicles (e.g. falls from animals); 4) late effects of accidental injuries. A complete list of these E-Codes is available. CAISP is actively working towards obtaining information on these events for future reports.

2.7.4 Reporting of Rates

There were two important limitations concerning the reporting of rates within this document.

1) From the information provided in the hospital records, it was not possible to know if the person who was injured was a farm resident, a hired worker or a visitor to the farm (numerator of rate). The best possible information concerning the population for a farm injury are the number of residents living in farm households, available from the Canadian Census of Agriculture and the Population Census (denominator of rate). Thus the denominator would exclude persons injured who were non-resident hired workers or visitors. We suspect that some of the farm injuries were to hired persons and visitors, making the reported rate an overestimate of the true rate.

2) Based on our observations of the incorrect use of the 5th digit location code as described in section 2.7.3, we think that the number of cases of non-machine farm injuries in particular are under reported. The effect of not including all injured persons in the numerator, while still including these counts as part of the denominator population is to underestimate the true rate of injury.

Despite the limitations described above, the authors felt that the estimated rates reported in this document provide some useful information concerning the frequency of these events when comparing age groups or when comparing other health outcomes of interest for this population. However, given the limitations described above, the rates that are reported should be viewed with caution.

3.0 MAGNITUDE OF THE PROBLEM

TOTAL EVENTS BY AGE AND GENDER

Table 3.1 shows the gender distribution of fatal and hospitalized farm injuries by age. Males were involved in the majority of injuries resulting in fatalities as well as hospitalization.

TABLE 3.1 Fatal and hospitalized farm injuries by age group and gender (8971 cases)

Age	Fatal				Hospitalized			
	Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%
0-9	45	6.9	15	25.4	448	6.6	177	12.3
10-19	38	5.9	5	8.5	809	11.9	228	15.9
20-29	59	9.1	4	6.8	736	10.8	143	10.0
30-39	78	12.0	8	13.6	1142	16.7	245	17.1
40-49	87	13.4	11	18.6	1093	16.0	230	16.0
50-59	93	14.3	9	15.3	996	14.6	185	12.9
60-69	116	17.9	1	1.7	960	14.1	142	9.9
70+	133	20.5	6	10.2	643	9.5	86	6.0
Total	**649**	**100**	**59**	**100**	**6827**	**100**	**1436**	**100**

Source: Canadian Agricultural Injury Surveillance Program

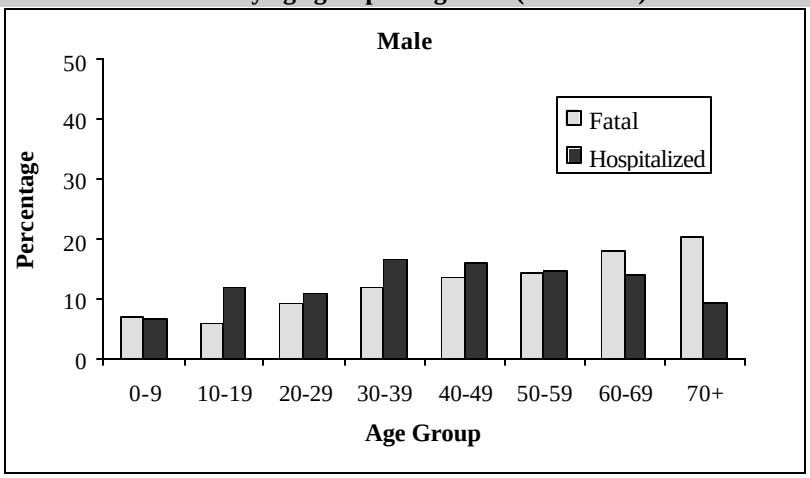
TOTAL EVENTS BY AGE AND GENDER (%)

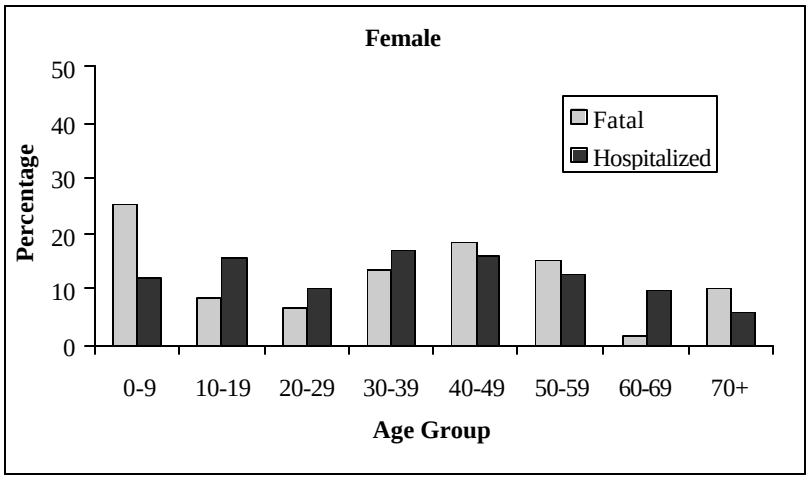
Figures 3.2a&b show the percentage distribution of fatal and hospitalized farm injuries by age group and gender.

Figure 3.2a shows male hospitalization being slightly higher while individuals are under the age of 60. However, over the age of 60, a greater proportion of injuries lead to fatality rather than hospitalization.

Figure 3.2b shows injuries to young girls have a greater proportion of fatalities than hospitalization. However, hospitalization is slightly higher for females between the ages of 10 and 39.

FIGURE 3.2a&b Proportions of fatal and hospitalized farm injuries by age group and gender (8971 cases)





TOTAL EVENTS BY GENDER

Table 3.3 shows the gender distribution of fatal and hospitalized farm injuries. Males dominated the number of fatal and hospitalized farm injuries.

For both genders, 71% of all fatalities were attributed to machinery. A greater percentage of hospitalized injuries were from non-machinery causes for females.

TABLE 3.3 Fatal and hospitalized farm injuries by gender distribution (8971 cases)

Type of Event	Male		Female		Total	
	No.	%	No.	%	No.	%
Fatal	**649**		**59**		**708**	
Machinery	458	6.1	42	2.8	500	5.6
Non-Machinery	191	2.6	17	1.1	208	2.3
Hospitalized	**6827**		**1436**		**8263**	
Machinery	3644	48.7	398	26.6	4042	45.0
Non-Machinery	3183	42.6	1038	69.4	4221	47.1
Total	**7476**	**100**	**1495**	**100**	**8971**	**100**

Source: Canadian Agricultural Injury Surveillance Program

TOTAL EVENTS BY MONTH AND GENDER

Table 3.4 shows the gender distribution of fatal and hospitalized farm injuries by month. Both fatalities and hospitalizations were high during the month of May as well as during the late Summer months. This trend was observed for both males and females.

TABLE 3.4 **Fatal and hospitalized farm injuries by month and gender (8971 cases)**

Month	Fatal				Hospitalized			
	Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%
Jan.-March	64	9.9	4	6.8	1010	14.8	200	13.9
April-June	172	26.5	12	20.3	1945	28.5	492	34.3
July-Sept.	254	39.1	29	49.2	2371	34.7	484	33.7
Oct.-Dec.	155	23.9	14	23.7	1500	22.0	260	18.1
Total	**649**	**100**	**59**	**100**	**6827**	**100**	**1436**	**100**

Source: Canadian Agricultural Injury Surveillance Program

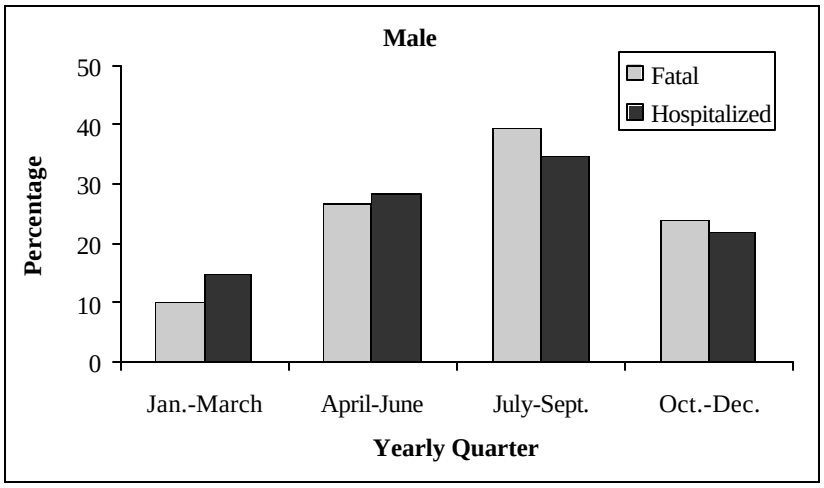
TOTAL EVENTS BY MONTH AND GENDER (%)

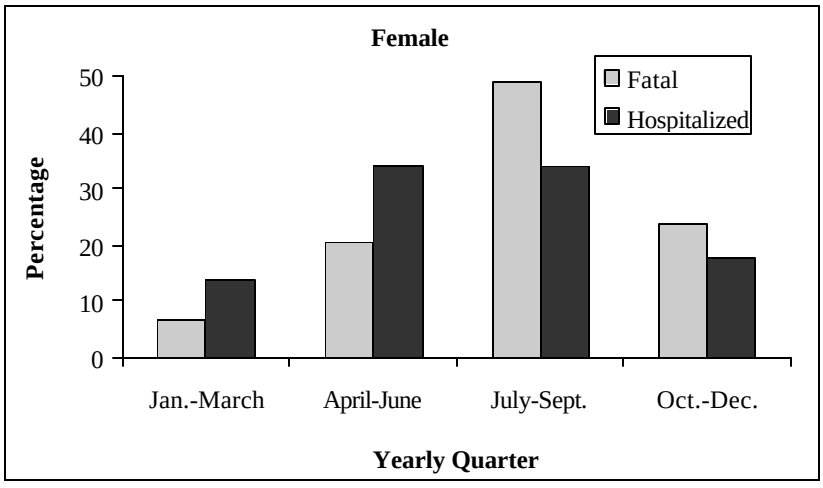
Figures 3.5a&b show the percentage of fatal and hospitalized farm injuries by month and gender.

Figure 3.5a shows male hospitalization and fatality both increasing during the late Summer months.

Figure 3.5b shows female hospitalization being highest in the Spring and Summer months. Female fatalities display a sharp increase in the late Summer months.

FIGURE 3.5a&b **Proportions of fatal and hospitalized farm injuries by month and gender (8971 cases)**





TOTAL EVENTS BY MECHANISM AND GENDER

Table 3.6 shows the gender distribution of fatal and hospitalized farm injuries by mechanism. Being run over or subject to a rollover were among the leading causes of fatalities for both males and females. However, caught in/ entanglement and animal-related trauma were among the leading causes for hospitalization for both genders. Note that falls were of a particular concern, especially for females.

TABLE 3.6 Fatal and hospitalized farm injuries by mechanism and gender (8987 cases)

Mechanism	Fatal				Hospitalized			
	Male		Female		Male		Female	
	No.	%	No	%	No.	%	No.	%
Machinery								
Run over	93	14.3	19	32.2	372	5.4	48	3.3
Rollover	148	22.8	10	16.9	178	2.6	23	1.6
Caught in/ entanglement	68	10.5	**	-	1253	18.4	107	7.5
Pinned or struck by machine	75	11.6	**	-	751	11.0	65	4.5
Motor vehicle	31	4.8	7	11.9	33	0.5	10	0.7
Fell from machine, not run over	14	2.2	0	0.0	525	7.7	86	6.0
Struck by falling or projected object	0	0.0	0	0.0	198	2.9	16	1.1
Other/unknown machinery	29	4.5	0	0.0	334	4.9	43	3.0
Non-Machinery								
Animal	27	4.2	6	10.2	1084	15.9	494	34.4
Fall	26	4.0	**	-	755	11.1	279	19.4
Struck by/against object	46	7.1	6	10.2	589	8.6	110	7.7
Radiation, toxic / noxious substances	13	2.0	0	0.0	204	3.0	42	2.9
Overexertion	0	0.0	0	0.0	213	3.1	52	3.6
Electric current	18	2.8	**	-	19	0.3	**	-
Caught in/under/ between objects	17	2.6	0	0.0	74	1.1	15	1.0
Fires	9	1.4	0	0.0	113	1.6	16	1.1
Temperature extremes	**	-	0	0.0	23	0.3	9	0.6
Other/ unknown non-machinery	32	4.9	**	-	109	1.6	18	1.3
Total	**649**	**100**	**59**	**100**	**6827**	**100**	**1436**	**100**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

TOTAL EVENTS BY AGE GROUP AND GENDER

Table 3.7 shows the gender distribution of fatal and hospitalized farm injuries by age group. For both genders, individuals between the ages of 15 and 59 had the highest number of fatalities and hospitalizations.

TABLE 3.7 Fatal and hospitalized farm injuries by age group and gender (8971 cases)*

Age Group	Machinery				Non-Machinery				Total	
	Male		Female		Male		Female		Male	Female
	No.	%	No.	%	No.	%	No.	%	No.	No.
0-14	451	11.0	119	27.2	379	11.2	207	19.7	830	326
15-59	2517	63.0	272	62.3	2255	66.8	656	62.5	4772	928
60+	1105	26.0	46	10.5	740	22.0	187	17.8	1845	233
Total	**4073**	**100**	**437**	**100**	**3374**	**100**	**1050**	**100**	**7447**	**1487**

* 37 cases missing information
Source: Canadian Agricultural Injury Surveillance Program

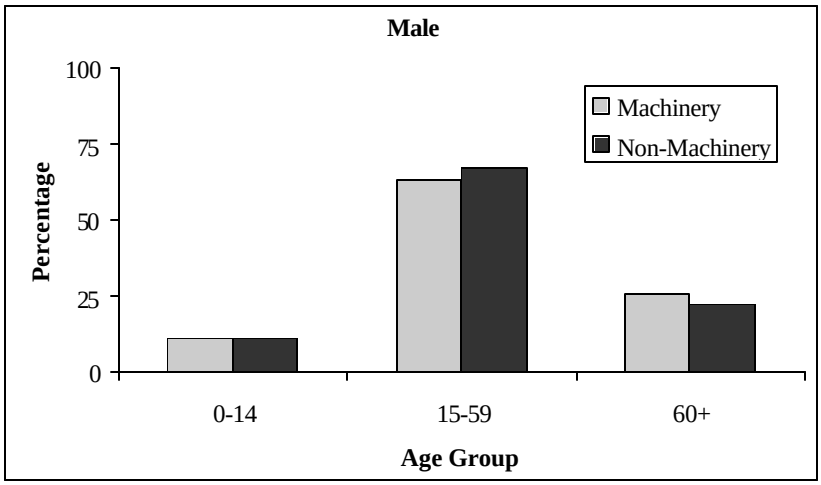
TOTAL EVENTS BY AGE GROUP AND GENDER (%)

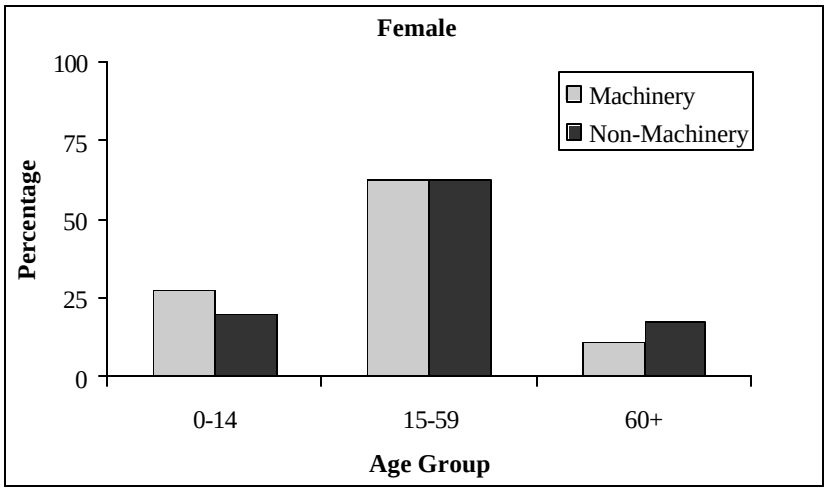
Figures 3.8a&b show the percentage distribution of fatal and hospitalized farm injuries by age group and gender.

Figure 3.8a shows that the proportion of male farm injuries caused by machinery versus non-machinery sources were nearly equal. Individuals between the ages of 15 and 59 had the largest proportion of injuries despite the source of the injury or the outcome of the injury.

Figure 3.8b shows farm injuries to young girls include a greater proportion of machinery sources whereas farm injuries to older females are more frequently due to a non-machinery cause. However, individuals between the ages of 15 and 59 were the most frequently injured regardless of the source.

FIGURE 3.8a&b Proportions of fatal and hospitalized farm injuries by age group and gender (8971 cases)*





4.0 GENDER ANALYSIS OF FATAL FARM INJURIES

AGE AND GENDER

Table 4.1 shows the gender distribution of fatal farm injuries by age. Overall, fatalities among males were eleven times higher than among females. Males in their sixties had a fatality rate more than 100 times higher than their female counterparts.

TABLE 4.1 Work-related fatal farm injuries by age and gender (708 cases)

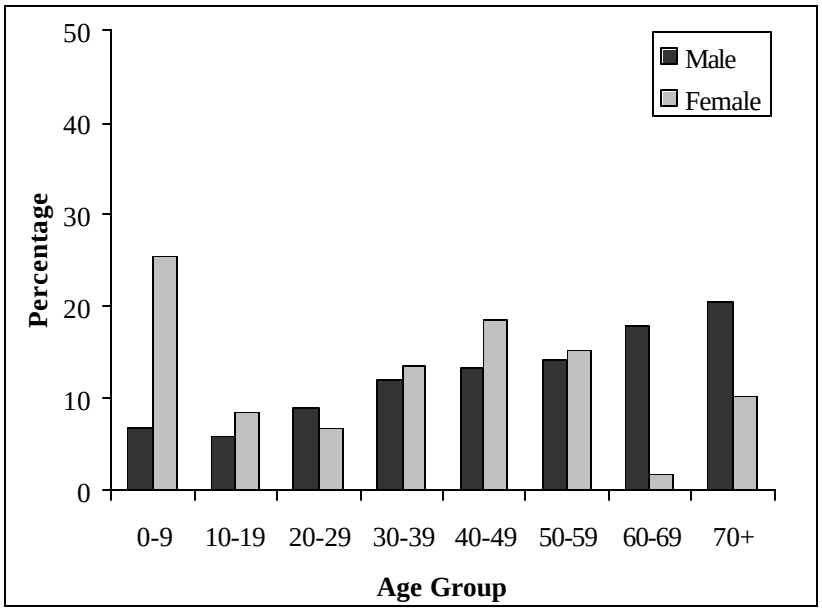
Age	Male		Female		Ratio
	No.	%	No.	%	Male:Female
0-9	45	6.9	15	25.4	3:1
10-19	38	5.9	5	8.5	8:1
20-29	59	9.1	4	6.8	15:1
30-39	78	12.0	8	13.6	10:1
40-49	87	13.4	11	18.6	8:1
50-59	93	14.3	9	15.3	10:1
60-69	116	17.9	1	1.7	116:1
70+	133	20.5	6	10.2	22:1
Total	**649**	**100**	**59**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 4.2 shows the percentage of fatal farm injuries by age and gender. Young girls were the largest proportion of female fatalities whereas male fatalities seemed to increase at a steady rate with an increase in age.

FIGURE 4.2 Proportions of work-related fatal farm injuries by age and gender (708 cases)



RELATIONSHIP TO FARM OWNER AND GENDER

Table 4.3 shows the gender distribution of fatal farm injuries by relationship of the deceased to the farm owner. Very few women were owner/operator or hired workers.

TABLE 4.3 Work-related fatal farm injuries by relationship of deceased to farm owner and gender (708 cases)*

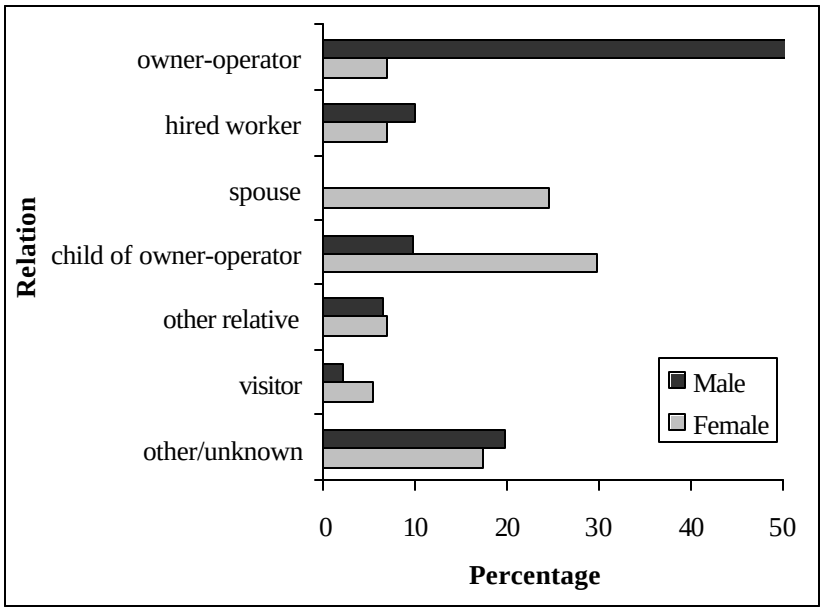
Relation	Male		Female		Ratio
	No.	%	No.	%	Male:Female
owner/operator	319	49.2	4	6.8	80:1
hired worker	62	10.0	4	6.8	156:1
spouse	0	0	15	25.5	-
child of owner	61	9.4	17	28.8	4:1
other relative	42	6.5	4	7.0	10:1
visitor	13	2.2	3	5.4	4:1
other/unknown	123	20.1	10	17.5	12:1
Total	**620**	**100**	**57**	**100**	**11:1**

* 31 cases missing relation information
Source: Canadian Agricultural Injury Surveillance Program

RELATIONSHIP TO FARM OWNER AND GENDER (%)

Figure 4.4 shows the percentage of fatal farm injuries by relationship of the deceased to the farm owner. The greatest proportion of farm injuries were to male owner-operators. Fatalities among women involved mainly a spouse or female child of the owner/operator.

FIGURE 4.4 Proportions of work-related fatal farm injuries by relationship of deceased to farm owner by gender (708 cases)*



YEAR AND GENDER

Table 4.5 shows the gender distribution of fatal farm injuries by year of occurrence. The highest gender ratio was observed in 1990. Due to the short period of study, a general trend cannot be discerned.

TABLE 4.5 **Work-related fatal farm injuries by year and gender (708 cases)**

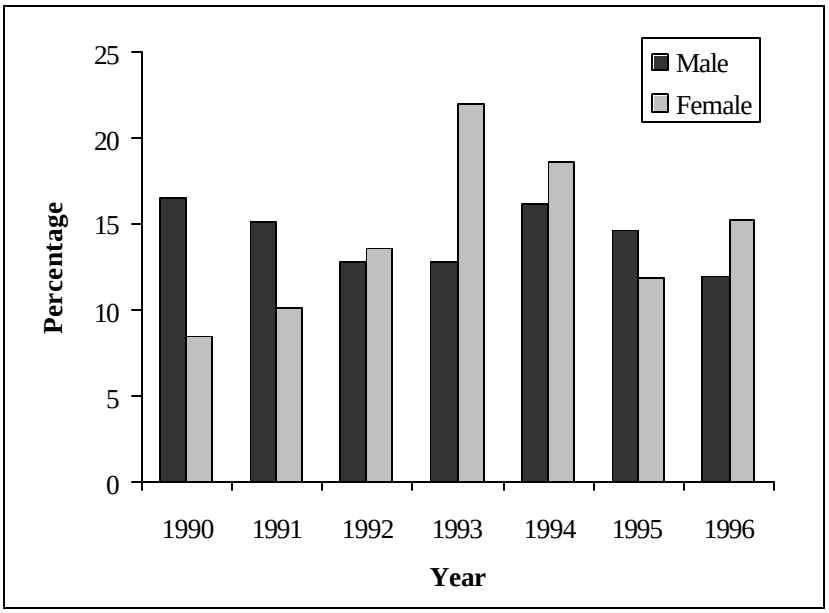
Year	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1990	107	16.5	5	8.5	21:1
1991	98	15.1	6	10.2	16:1
1992	83	12.8	8	13.6	10:1
1993	83	12.8	13	22.0	6:1
1994	105	16.2	11	18.6	10:1
1995	95	14.6	7	11.9	14:1
1996	78	12.0	9	15.3	9:1
Total	**649**	**100**	**59**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

YEAR AND GENDER (%)

Figure 4.6 shows the percentage of fatal farm injuries by year of occurrence and gender. The largest proportion of female fatalities occurred in 1993, whereas the proportion of male fatalities was more evenly distributed.

FIGURE 4.6 **Proportions of work-related fatal farm injuries by year and gender (708 cases)**



YEARLY QUARTER AND GENDER

Table 4.7 shows the gender distribution of fatal farm injuries by yearly quarters and gender. During the first quarter, male fatalities were sixteen times higher than their female counterparts.

TABLE 4.7 **Work-related fatal farm injuries by yearly quarter and gender (708 cases)***

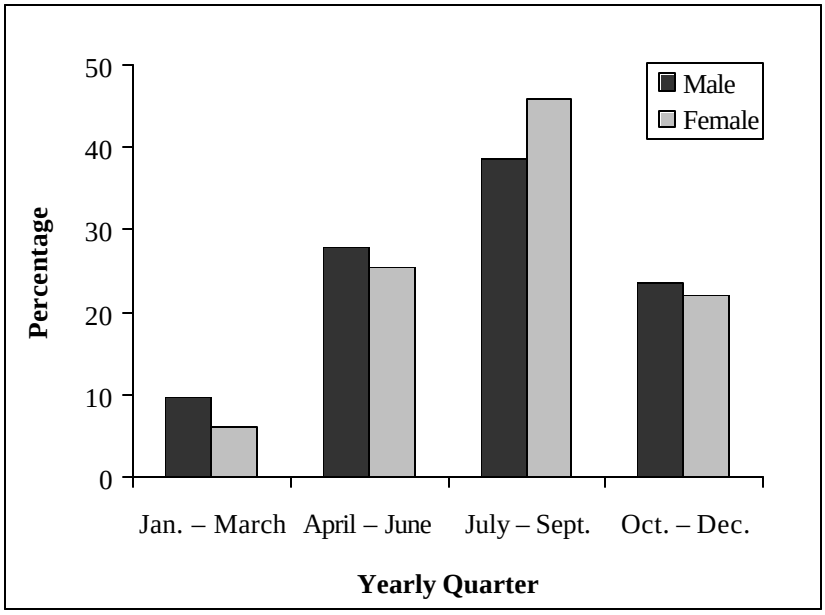
Yearly Quarter	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Jan.-March	64	9.9	4	6.8	16:1
April-June	172	26.7	12	20.3	14:1
July-Sept.	254	39.4	29	49.2	9:1
Oct.-Dec.	155	24.0	14	23.7	11:1
Total	**645**	**100**	**59**	**100**	**11:1**

* 4 cases missing month information
Source: Canadian Agricultural Injury Surveillance Program

YEARLY QUARTER AND GENDER (%)

Figure 4.8 shows the percentage of fatal farm injuries by yearly quarters and gender. The greatest proportion of fatalities for both genders occurred during the late Summer months.

FIGURE 4.8 **Proportions of work-related fatal farm injuries by yearly quarter and gender (708 cases)***



DAY OF THE WEEK AND GENDER

Table 4.9 shows the percentage of fatal farm injuries by day of the week. The highest number of fatalities for both genders occurred at the beginning of the work week. However, both genders had few deaths occurring on a Sunday.

TABLE 4.9 Work-related fatal farm injuries by day of the week and gender (708 cases)*

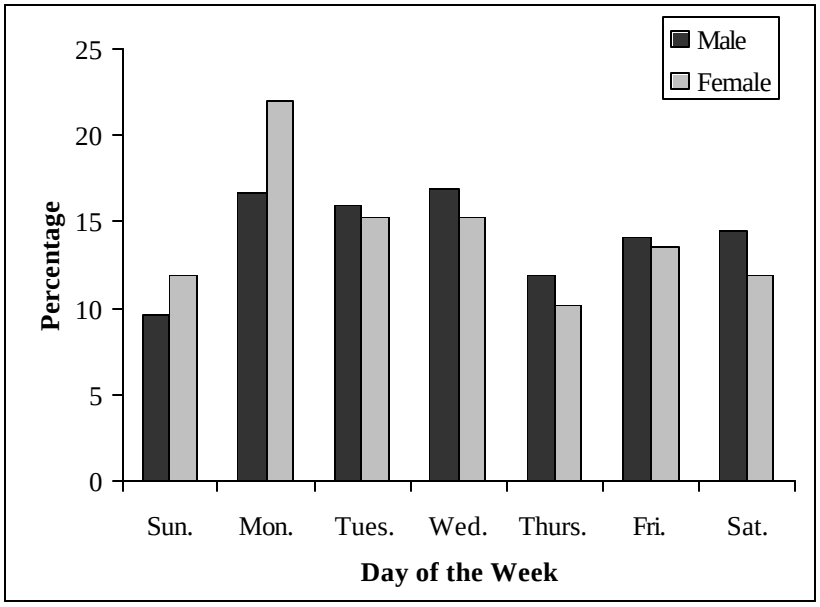
Day	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Sunday	62	9.6	7	11.9	9:1
Monday	108	16.7	13	22.0	8:1
Tuesday	103	16.0	9	15.3	11:1
Wednesday	109	16.9	9	15.3	12:1
Thursday	77	11.9	6	10.2	13:1
Friday	91	14.1	8	13.6	11:1
Saturday	95	14.5	7	11.9	14:1
Total	**645**	**100**	**59**	**100**	**11:1**

* 4 cases missing day of week information
Source: Canadian Agricultural Injury Surveillance Program

DAY OF THE WEEK AND GENDER (%)

Figure 4.10 shows the percentage of fatal farm injuries by day of the week and by gender. Proportionally, more fatalities occurred on Mondays for females while for males the incidence leading to death were more evenly distributed.

FIGURE 4.10 Work-related fatal farm injuries by day of the week and gender (708 cases)*



TIME OF DAY AND GENDER

Table 4.11 shows the gender distribution of fatal farm injuries by time of day. Male fatalities are seventeen times higher than females during the morning hours.
(The time of day categories are mutually exclusive)

TABLE 4.11 Work-related fatal farm injuries by time of day and gender (708 cases)*

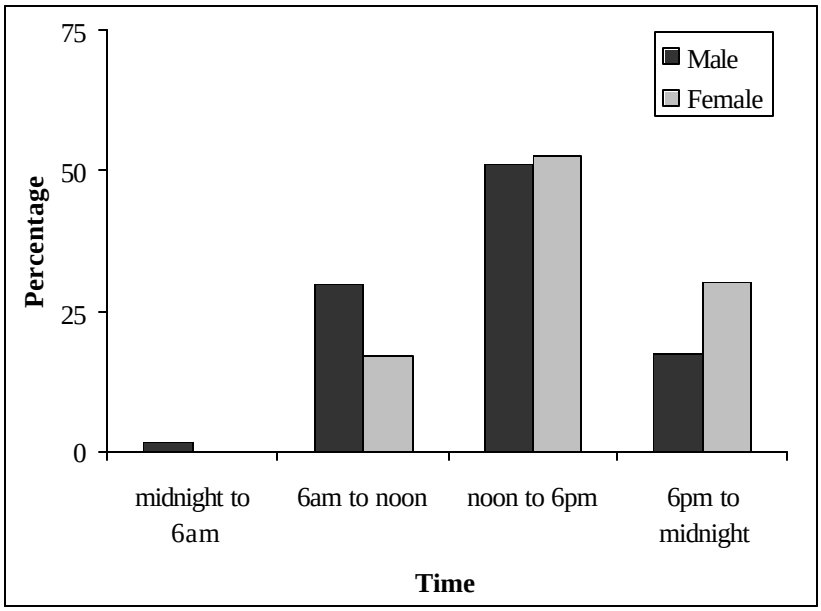
Time	Male		Female		Ratio
	No.	%	No.	%	Male:Female
midnight to 6am	8	1.6	0	0.0	-
6am to noon	153	29.8	9	17.0	17:1
noon to 6pm	263	51.2	28	52.8	9:1
6pm to midnight	90	17.5	16	30.2	6:1
Total	**514**	**100**	**53**	**100**	**10:1**

* 141 cases missing time of day information
Source: Canadian Agricultural Injury Surveillance Program

TIME OF DAY AND GENDER (%)

Figure 4.12 shows the percentage of fatal farm injuries by time of day and gender. Approximately half of all fatalities occurred in the afternoon. Be conservative with this distribution as nearly 20% of the observations were missing.

FIGURE 4.12 Proportions of work-related fatal farm injuries by time of day and gender (708 cases)*



TIME TO DISCOVERY AND GENDER

Table 4.13 shows the gender distribution of fatal farm injuries by length of time until discovery of the injured person. When this was known, witnessed fatalities were most common for both males and females.

TABLE 4.13 Work-related fatal farm injuries by time until discovery and gender (708 cases)*

Time to Discovery	Male		Female	
	No.	%	No.	%
witnessed	104	17.2	19	33.3
less than 1 hour	50	8.3	1	1.8
1-4 hour	43	7.1	1	1.8
more than 4 hours	32	5.3	2	3.5
unknown	376	62.1	34	59.6
Total	**605**	**100**	**57**	**100**

* 46 cases missing time until discovery information
Source: Canadian Agricultural Injury Surveillance Program

LOCATION OF DEATH AND GENDER

Table 4.14 shows the gender distribution of fatal farm injuries by location of death. The majority of both sexes were found dead and a similar proportion died in hospital.

TABLE 4.14 Work-related fatal farm injuries by location of death and gender (708 cases)*

Location	Male		Female	
	No.	%	No.	%
found dead	373	62.1	30	52.6
died in hospital	110	18.3	12	21.1
died enroute	34	5.7	5	8.8
unknown	57	9.5	4	7.0
other	14	2.3	3	5.3
Total	**601**	**100**	**57**	**100**

* 50 cases missing location of death information
Source: Canadian Agricultural Injury Surveillance Program

LOCATION OF INJURY AND GENDER

Table 4.15 shows the gender distribution of fatal farm injuries by location of injury. Male fatalities involving a water source were over twenty times higher than their female counterparts.

TABLE 4.15 Work-related fatal farm injuries by location of injury and gender (708 cases)*

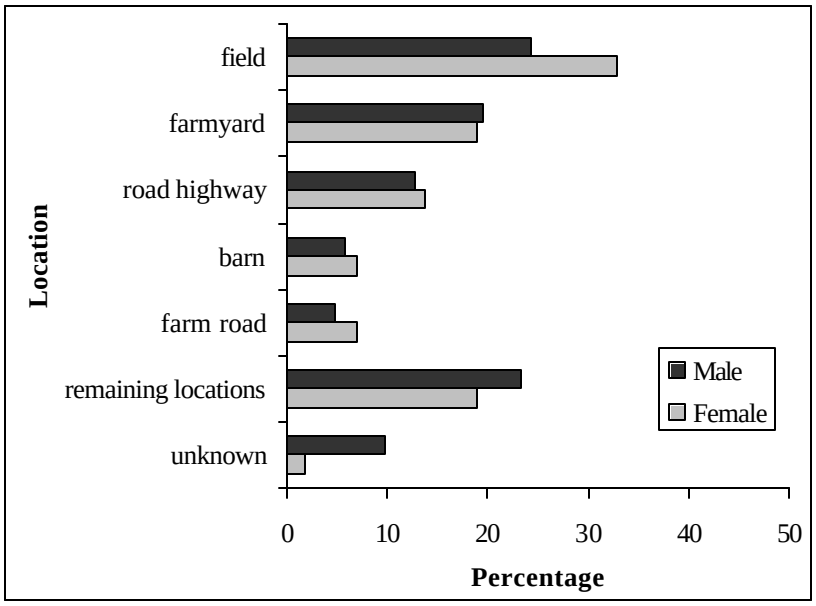
Location	Male		Female		Ratio
	No.	%	No.	%	Male:Female
field	153	24.2	19	32.8	8:1
farmyard	123	19.4	11	19.0	11:1
road highway	80	12.6	8	13.8	10:1
barn	36	5.7	4	6.9	9:1
farm road	31	4.9	4	6.9	8:1
silo	20	3.2	3	5.2	7:1
driveway	11	1.7	2	3.4	6:1
water source	20	3.2	1	1.7	20:1
shed	13	2.1	1	1.7	13:1
other	83	13.1	4	6.9	21:1
unknown	62	9.8	1	1.7	62:1
Total	**632**	**100**	**58**	**100**	**11:1**

* 18 cases missing location of injury information
Source: Canadian Agricultural Injury Surveillance Program

LOCATION OF INJURY AND GENDER (%)

Figure 4.16 shows the percentage of fatal farm injuries by location of injury and gender. A slightly higher proportion of females were injured in the field and on road highways, as opposed to other locations.

FIGURE 4.16 Proportions of work-related fatal farm injuries by location of injury and gender (708 cases)*



PROVINCE AND GENDER

Table 4.17 shows the gender distribution of fatal farm injuries by province. In Alberta, male fatalities were nearly twenty times higher than female deaths. Yet for British Columbia the male-to-female ratio was approximately 5 to 1. Note that there were no female fatalities in Nova Scotia or Prince Edward Island.

TABLE 4.17 Work-related fatal farm injuries by Province and gender (708 cases)

Province	Male		Female		Ratio
	No.	%	No.	%	Male:Female
British Columbia	48	7.4	10	16.9	5:1
Alberta	98	15.1	5	8.5	20:1
Saskatchewan	91	14.0	10	16.9	9:1
Manitoba	55	8.5	4	6.8	14:1
Ontario	198	30.5	15	25.4	13:1
Quebec	119	18.3	13	22.0	9:1
New Brunswick	14	2.2	2	3.4	7:1
Nova Scotia	16	2.5	0	0.0	-
Prince Edward Island	10	1.5	0	0.0	-
Total	**649**	**100**	**59**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

5.0 GENDER ANALYSIS OF FATAL FARM MACHINERY INJURIES

AGE AND GENDER

Table 5.1 shows the gender distribution of fatal farm injuries by age. Machinery fatalities among males were nearly eleven times higher than among females. Fatalities among males over 60 were at least 50 times higher than their female counterparts.

TABLE 5.1 Work-related fatal farm machinery injuries by age and gender (500 cases)

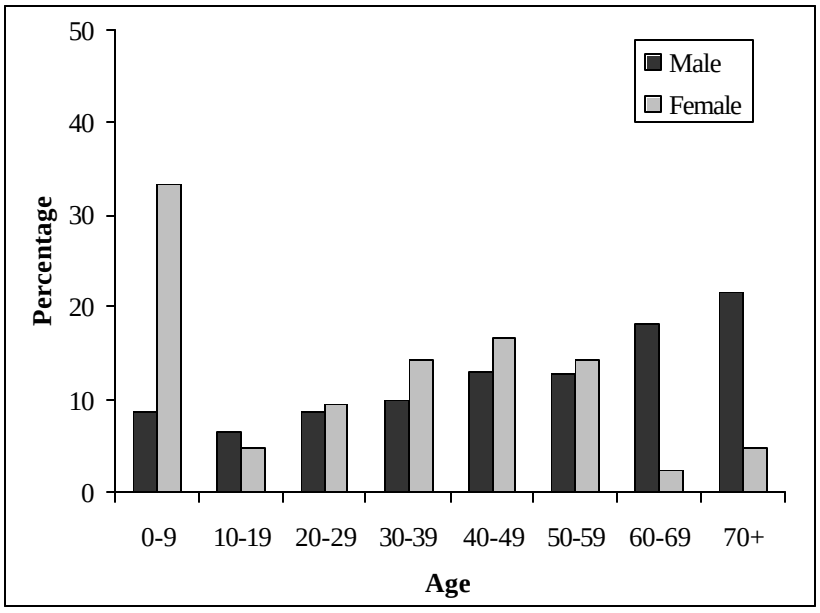
Age	Male		Female		Ratio
	No.	%	No.	%	Male:Female
0-9	40	8.7	14	33.3	3:1
10-19	30	6.6	2	4.8	15:1
20-29	40	8.7	4	9.5	10:1
30-39	46	10.0	6	14.3	8:1
40-49	60	13.1	7	16.7	9:1
50-59	59	12.9	6	14.3	10:1
60-69	84	18.3	1	2.4	84:1
70+	99	21.6	2	4.8	50:1
Total	**458**	**100**	**42**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 5.2 shows the percentage of fatal farm injuries by age category and gender. Girls under the age of 9 accounted for one third of all farm machinery fatalities involving females.

FIGURE 5.2 Proportions of work-related fatal farm machinery injuries by age and gender (500 cases)



MECHANISM OF INJURY AND GENDER

Table 5.3 shows the gender distribution of fatal farm machinery injuries by mechanism of injury. Fatalities due to being pinned or struck by a machine were nearly 38 times more frequent among males.

TABLE 5.3 Work-related fatal farm machinery injuries by mechanism of injury and gender (500 cases)

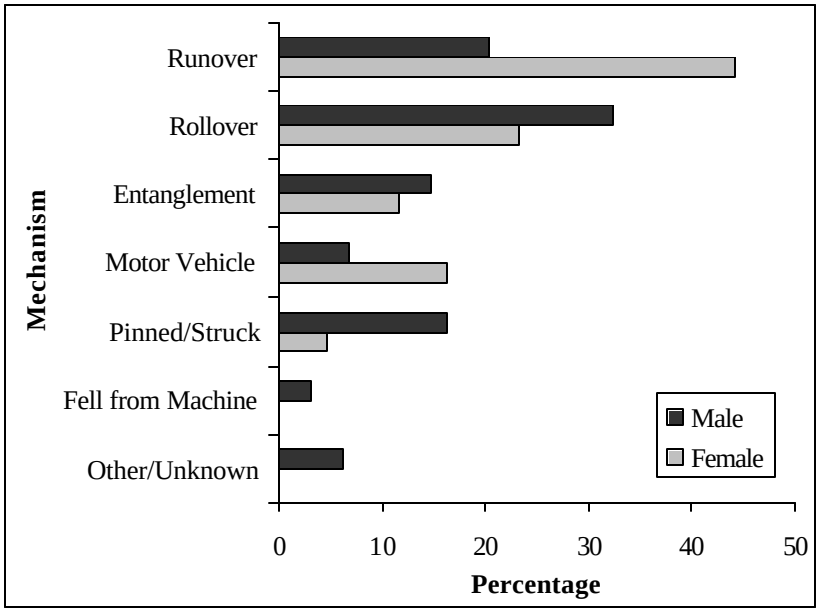
Mechanism	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Run over	93	20.3	19	44.2	5:1
Rollover	148	32.3	10	23.3	15:1
Caught in / entanglement	68	14.8	4	11.6	14:1
Motor vehicle	31	6.8	7	16.3	4:1
Pinned or struck by machine	75	16.4	2	4.7	38:1
Fell from machine, not run over	14	3.1	0	0.0	-
Other/unknown	29	6.3	0	0.0	-
Total	**458**	**100**	**42**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

MECHANISM OF INJURY AND GENDER (%)

Figure 5.4 shows the percentage of fatal farm injuries by mechanism of injury and gender. For males, proportionally more fatalities were due to rollovers and being pinned/struck by machines. For females, being run over and motor vehicles were relatively higher in proportion.

FIGURE 5.4 Proportions of work-related fatal farm machinery injuries by mechanism of injury and gender (500 cases)



MACHINE TYPE AND GENDER

Table 5.5 shows the gender distribution of fatal farm injuries by machine type. Tractors were the dominant cause of death for both sexes.

TABLE 5.5 **Work-related fatal farm machinery injuries by machine type and gender (500 cases)**

Machine Type	Male		Female		Ratio
	No.	%	No.	%	Male:Female
tractor	298	65.1	29	69.0	10:1
motor vehicle	30	6.6	4	9.5	8:1
power take off	18	3.9	2	4.8	9:1
farm wagon	4	0.9	1	2.4	4:1
mower	4	0.9	1	2.4	4:1
combine	3	0.7	1	2.4	3:1
welder	2	0.4	1	2.4	2:1
baler	13	2.8	0	0.0	-
grain auger	12	2.6	0	0.0	-
harvester	7	1.5	0	0.0	-
recreation vehicle	5	1.1	0	0.0	
manure spreader	5	1.1	0	0.0	-
plough disk	2	0.4	0	0.0	-
chainsaw	2	0.4	0	0.0	-
other farm implement	50	10.9	3	7.1	17:1
unknown	3	0.7	0	0.0	-
Total	**458**	**100**	**42**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

YEAR AND GENDER

Table 5.6 shows the gender distribution of fatal farm injuries by year of occurrence. In 1990, the number of male fatalities due to machinery was highest, yet female fatalities were at their lowest value. Due to the short period of study, a general trend cannot be discerned.

TABLE 5.6 Work-related fatal farm machinery injuries by year and gender (500 cases)

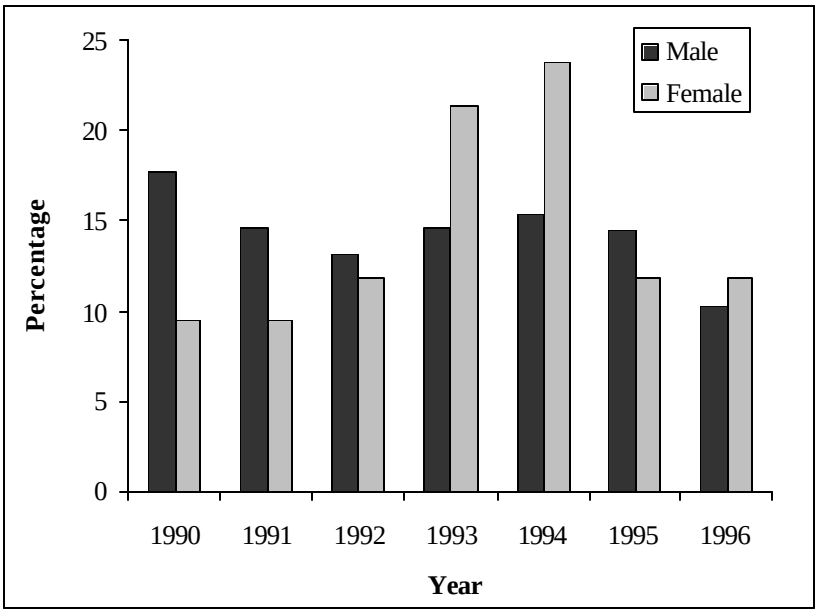
Year	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1990	81	17.7	4	9.5	20:1
1991	67	14.6	4	9.5	17:1
1992	60	13.1	5	11.9	12:1
1993	67	14.6	9	21.4	7:1
1994	70	15.3	10	23.8	7:1
1995	66	14.4	5	11.9	13:1
1996	47	10.3	5	11.9	9:1
Total	**458**	**100**	**42**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

YEAR AND GENDER (%)

Figure 5.7 shows the percentage of fatal farm injuries due to machinery by year of occurrence and gender. In 1993 and 1994, the proportion of female fatalities was slightly higher than male fatalities, which were more evenly distributed.

FIGURE 5.7 Proportions of work-related fatal farm machinery injuries by year and gender (500 cases)



MONTH AND GENDER

Table 5.8 shows the gender distribution of fatal farm injuries due to machinery by month and gender. During the month of June, male fatalities were 47 times higher than their female counterparts.

TABLE 5.8 **Work-related fatal farm machinery injuries by month and gender (500 cases)***

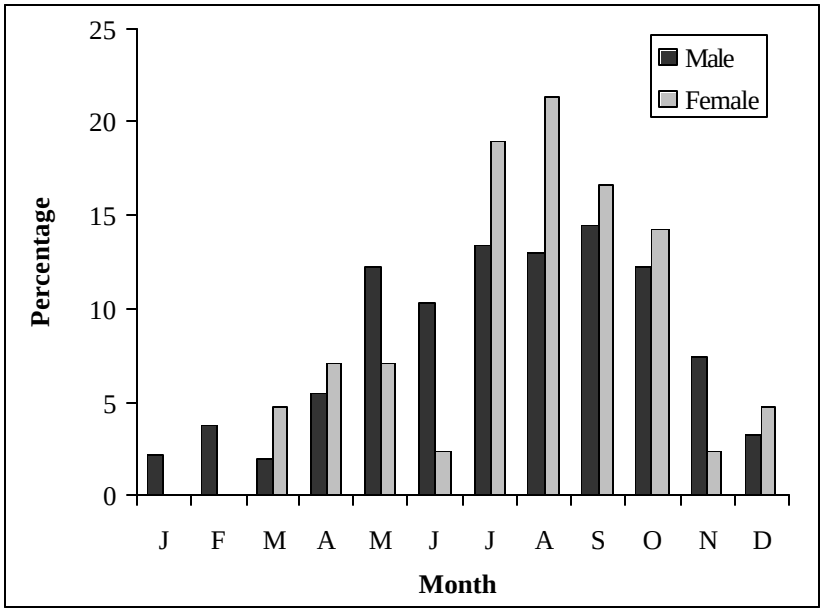
Month	Male		Female		Ratio
	No.	%	No.	%	Male:Female
January	10	2.2	0	0.0	-
February	17	3.7	0	0.0	-
March	9	2.0	2	4.8	5:1
April	25	5.5	3	7.1	8:1
May	56	12.3	3	7.1	19:1
June	47	10.3	1	2.4	47:1
July	61	13.4	8	19.0	8:1
August	59	13.0	9	21.4	7:1
September	66	14.5	7	16.7	9:1
October	56	12.3	6	14.3	9:1
November	34	7.5	1	2.4	34:1
December	15	3.3	2	4.8	8:1
Total	**455**	**100**	**42**	**100**	**11:1**

* 3 cases missing month information
Source: Canadian Agricultural Injury Surveillance Program

MONTH AND GENDER (%)

Figure 5.9 shows the percentage of fatal farm injuries involving machinery by month and gender. During the late Summer months, the greatest proportion of fatalities occurred with the largest increase for females.

FIGURE 5.9 **Proportions of work-related fatal farm machinery injuries by month and gender (500 cases)***



6.0 GENDER ANALYSIS OF FATAL NON-MACHINERY FARM INJURIES

AGE AND GENDER

Table 6.1 shows the gender distribution of fatal non-machinery farm injuries by age. Non-machine related fatalities among males were more than eleven times higher than among females. Fatalities were highest for individuals over the age of 30.

TABLE 6.1 Work-related fatal non-machinery farm injuries by age and gender (208 cases)

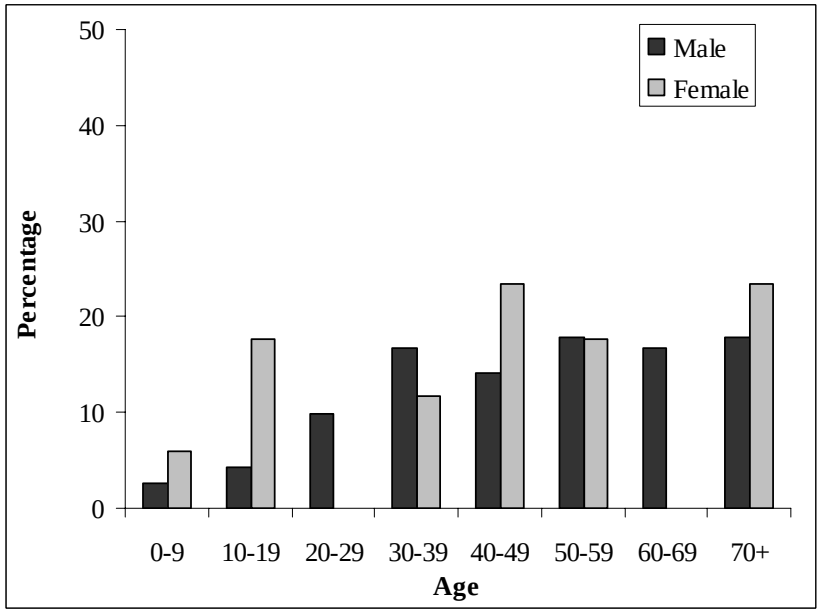
Age	Male		Female		Ratio
	No.	%	No.	%	Male:Female
0-9	5	2.6	1	5.9	5:1
10-19	8	4.2	3	17.6	3:1
20-29	19	9.9	0	0.0	-
30-39	32	16.8	2	11.8	16:1
40-49	27	14.1	4	23.5	7:1
50-59	34	17.8	3	17.6	11:1
60-69	32	16.8	0	0.0	-
70+	37	19.4	4	23.5	9:1
Total	**191**	**100**	**17**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 6.2 shows the percentage of fatal non-machinery farm injuries by age and gender. For both males and females non-machinery fatalities were lowest for children under the age of 10. For females it is between 20-29 that injuries are lowest (0 injuries).

FIGURE 6.2 Proportions of work-related fatal non-machinery farm injuries by age and gender (208 cases)



CAUSE AND GENDER

Table 6.3 shows the gender distribution of fatal non-machinery farm injuries by cause. Being struck by/against an object and animal-related fatalities were the most common for both males and females.

TABLE 6.3 Work-related fatal non-machinery farm injuries by cause and gender (208 cases)

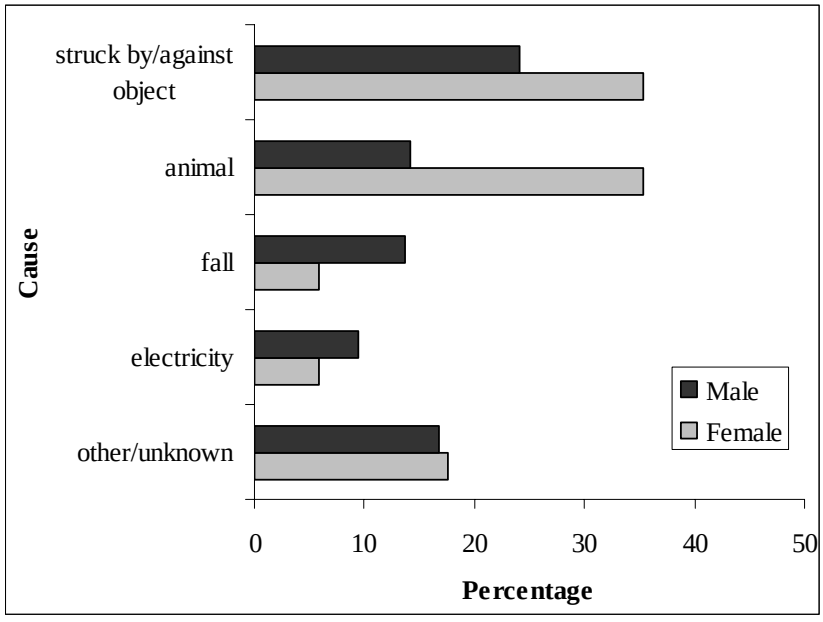
Cause	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Struck by / against object	46	24.1	6	35.3	8:1
Animal	27	14.1	6	35.3	5:1
Fall	26	13.6	1	5.9	26:1
Electricity	18	9.4	1	5.9	18:1
Caught in/under/ between objects	17	8.9	0	0.0	-
Radiation, toxic/noxious substances	13	6.8	0	0.0	-
Fires	9	4.7	0	0.0	-
Temperature	3	1.6	0	0.0	-
Other/unknown	32	16.8	3	17.6	11:1
Total	**191**	**100**	**17**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

CAUSE AND GENDER (%)

Figure 6.4 shows the percentage of fatal non-machinery farm injuries by cause and gender. Being struck against an object or animal involvement accounted for over 70% of female fatalities.

FIGURE 6.4 Work-related fatal non-machinery farm injuries by cause and gender (208 cases)



YEAR AND GENDER

Table 6.5 shows the gender distribution of fatal farm injuries by year of occurrence. In 1994, the number of male fatalities due to non-machinery causes was highest, yet female fatalities were at their lowest value. Due to the short period of study, a general trend cannot be discerned.

TABLE 6.5 Work-related fatal non-machinery farm injuries by year and gender (208 cases)

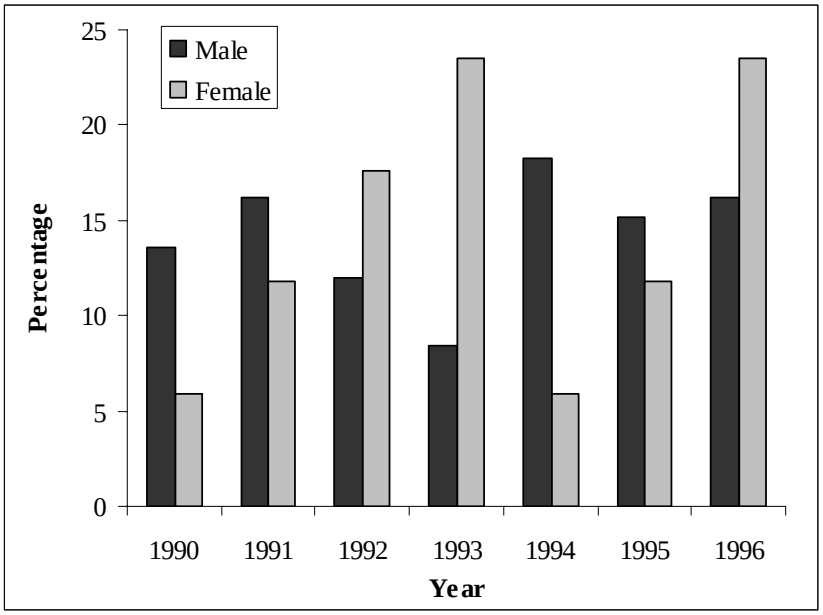
Year	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1990	26	13.6	1	5.9	26:1
1991	31	16.2	2	11.8	16:1
1992	23	12.0	3	17.6	8:1
1993	16	8.4	4	23.5	4:1
1994	35	18.3	1	5.9	35:1
1995	29	15.2	2	11.8	15:1
1996	31	16.2	4	23.5	8:1
Total	**191**	**100**	**17**	**100**	**11:1**

Source: Canadian Agricultural Injury Surveillance Program

YEAR AND GENDER (%)

Figure 6.6 shows the percentage of fatal farm injuries due to non-machinery causes by year of occurrence and gender. In 1993, the proportion of female fatalities was slightly higher than for males.

FIGURE 6.6 Proportions of work-related fatal non-machinery farm injuries by year and gender (208 cases)



MONTH AND GENDER

Table 6.7 shows the gender distribution of fatal farm injuries due to non-machinery causes by month and gender. In the month of October, there were 20 times more male fatalities due to non-machinery causes then their female counterparts.

TABLE 6.7 **Work-related fatal non-machinery farm injuries by month and gender (208 cases)***

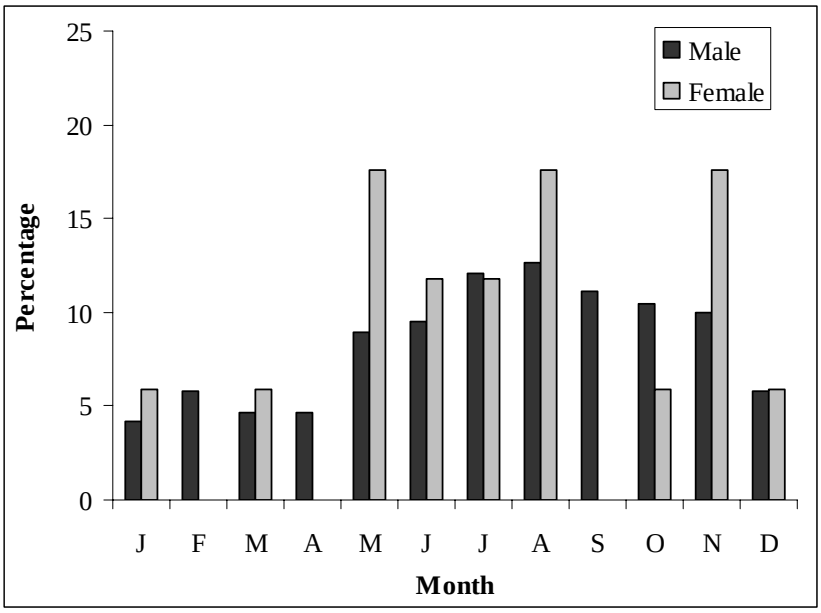
Month	Male		Female		Ratio
	No.	%	No.	%	Male:Female
January	8	4.2	1	5.9	8:1
February	11	5.8	0	0.0	-
March	9	4.7	1	5.9	9:1
April	9	4.7	0	0.0	-
May	17	8.9	3	17.6	6:1
June	18	9.5	2	11.8	9:1
July	23	12.1	2	11.8	12:1
August	24	12.6	3	17.6	8:1
September	21	11.1	0	0.0	-
October	20	10.5	1	5.9	20:1
November	19	10.0	3	17.6	6:1
December	11	5.8	1	5.9	11:1
Total	**190**	**100**	**17**	**100**	**11:1**

* 1 case missing month information
Source: Canadian Agricultural Injury Surveillance Program

MONTH AND GENDER (%)

Figure 6.8 shows the percentage of fatal farm injuries involving non-machinery causes by month and gender. During the Spring and Summer months, the greatest proportion of non-machinery fatalities occurred.

FIGURE 6.8 **Proportions of work-related fatal non-machinery farm injuries by month and gender (208 cases)***



7.0 GENDER ANALYSIS OF HOSPITALIZED FARM INJURIES

RATES AND GENDER

MALES

Table 7.1 shows the rate of hospitalization for males due farm injuries. The rate increased steadily with age, as there was more than a four-fold increase between individuals under the age of 9 and those over the age of 70.

TABLE 7.1 Estimated Rates (100,000 farm population) of hospitalized farm injuries by age (6827 cases)

MALES

Age	Hospitalization		Farm Populationϕ		Rate/100,000/yr
	No.	%	No.	%	
0-9	448	6.5	66611	14.5	134.5
10-19	809	11.8	84944	18.5	190.5
20-29	736	10.8	51165	11.1	287.7
30-39	1142	16.7	63639	13.8	359.2
40-49	1093	16.0	68321	14.9	320.0
50-59	996	14.6	58985	12.8	337.7
60-69	960	14.1	44355	9.6	432.9
70+	643	9.5	21502	4.7	598.1
Total	**6827**	**100**	**459521**	**100**	**297.2**

Source: Canadian Agricultural Injury Surveillance Program
ϕStatistics Canada, Census of Agriculture 1993, interpolated

FEMALES

Table 7.2 shows the rate of hospitalization for females due to farm injuries. The rate increased steadily with age as the rate nearly tripled between individuals under the age of 9 and those over the age of 70.

TABLE 7.2 Estimated Rates (100,000 farm population) of hospitalized farm injuries by age (1436 cases)

FEMALES

Age	Hospitalization		Farm Populationϕ		Rate/100,000/yr
	No.	%	No.	%	
0-9	177	9.1	62679	15.6	56.5
10-19	228	9.6	76605	19.2	59.5
20-29	143	11.8	39132	9.7	73.1
30-39	245	13.0	61066	15.2	80.2
40-49	230	11.5	64849	16.2	70.9
50-59	185	11.7	51062	12.7	72.5
60-69	142	14.8	31057	7.7	91.4
70+	86	18.6	14949	3.7	115.1
Total	**1436**	**100**	**401403**	**100**	**71.5**

Source: Canadian Agricultural Injury Surveillance Program
ϕStatistics Canada, Census of Agriculture 1993, interpolated

AGE AND GENDER

Table 7.3 shows the gender distribution of hospitalized farm injuries by age. Overall, hospitalization among males was nearly five times higher than among females. The male-to-female ratio for farm injuries ranges from a minimum of 3:1 for the youngest age group to a maximum of 8:1 for the oldest age group.

TABLE 7.3 Hospitalized farm injuries by age and gender (8263 cases)

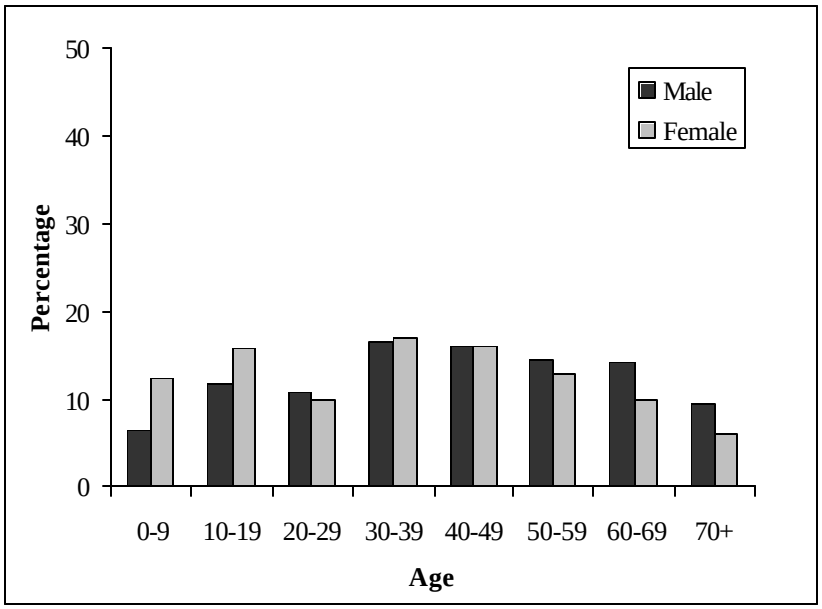
Age Group	Male		Female		Ratio
	No.	%	No.	%	Male:Female
0-9	448	6.5	177	12.4	3:1
10-19	809	11.8	228	15.8	4:1
20-29	736	10.8	143	10.0	5:1
30-39	1142	16.7	245	17.1	5:1
40-49	1093	16.0	230	16.0	5:1
50-59	996	14.6	185	12.9	5:1
60-69	960	14.1	142	9.9	7:1
70+	643	9.5	86	6.0	8:1
Total	**6827**	**100**	**1436**	**100**	**5:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 7.4 shows the percentage of hospitalized farm injuries by age and gender. For individuals between the ages of 20 and 59, the proportion of males and females injured was almost equal within each age group. Girls (under the age of 19) had a higher proportion of injuries than boys. However, older individuals showed a reversed pattern such that a larger proportion of males were injured.

FIGURE 7.4 Proportions of hospitalized farm injuries by age and gender (8263 cases)



FISCAL YEAR AND GENDER

Table 7.5 shows the gender distribution of farm injuries by each fiscal year during the time frame of this study. The male-to-female ratio of hospitalized farm injuries remained relatively stable throughout the study, being at a low in 1991-1992 and peaked in 1993-1994. Due to the short period of study, a general trend cannot be discerned.

Table 7.5 Hospitalized farm injuries by fiscal year and gender (8263 cases)*

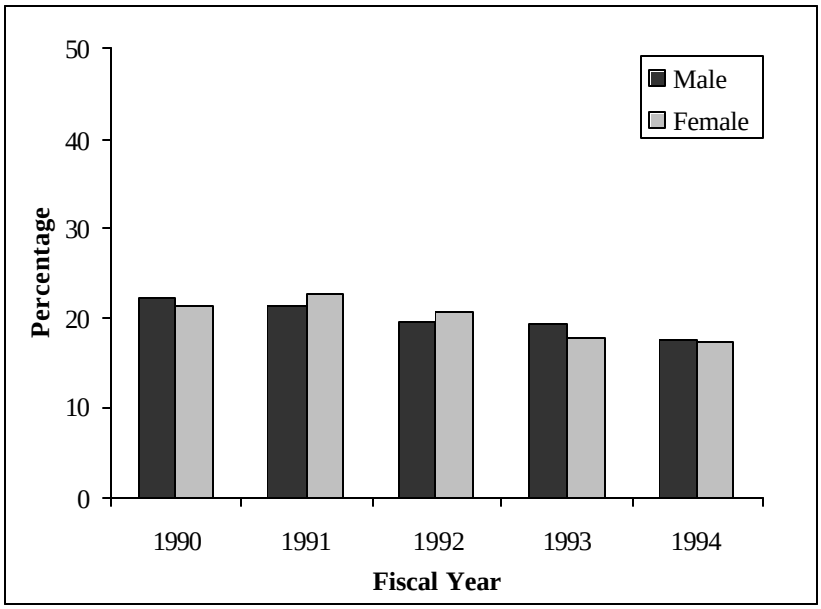
Fiscal Year	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1990	1522	22.3	306	21.3	5:1
1991	1454	21.3	327	22.8	4:1
1992	1331	19.5	299	20.8	5:1
1993	1324	19.4	256	17.8	5:1
1994	1195	17.5	248	17.3	5:1
Total	**6826**	**100**	**1436**	**100**	**5:1**

* 1 case missing year information
Source: Canadian Agricultural Injury Surveillance Program

FISCAL YEAR AND GENDER (%)

Figure 7.6 shows the percentage hospitalized farm injuries by fiscal year and gender. Within each fiscal year, the percentage of males and females hospitalized for injury remained relatively equal, ranging from approximately 17% to 23% for both genders

FIGURE 7.6 Proportions of hospitalized farm injuries by fiscal year and gender (8263 cases)*



MONTH AND GENDER

Table 7.7 shows the gender distribution of hospitalized farm injuries by gender in yearly quarters. The male-to-female ratio was highest in the month of December and lowest in the month of June.

TABLE 7.7 Hospitalized farm injuries by month and gender (8263 cases)*

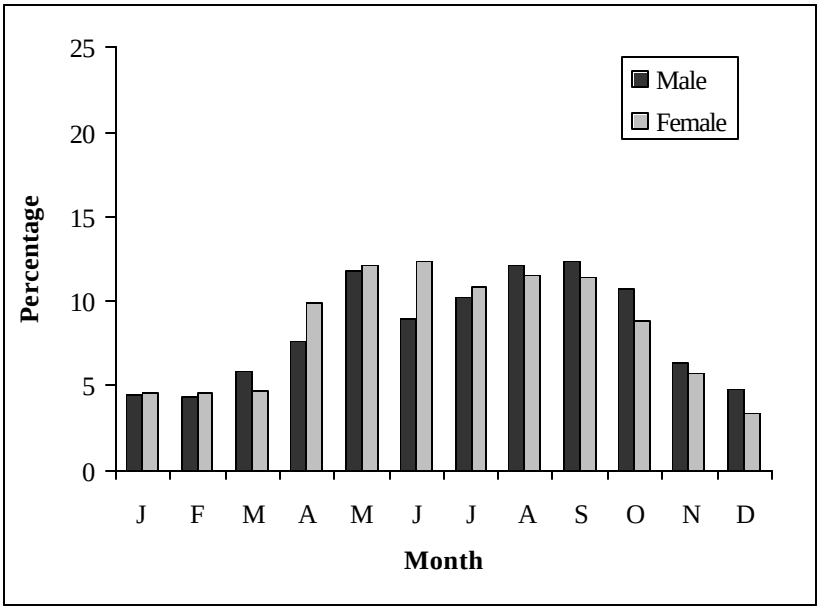
Month	Male		Female		Ratio
	No.	%	No.	%	Male:Female
January	305	4.5	66	4.6	5:1
February	302	4.4	66	4.6	5:1
March	403	5.9	68	4.7	6:1
April	521	7.6	142	9.9	4:1
May	807	11.8	174	12.1	5:1
June	617	9.0	176	12.3	4:1
July	705	10.3	156	10.9	5:1
August	823	12.1	165	11.5	5:1
September	843	12.3	163	11.4	5:1
October	737	10.8	128	8.9	6:1
November	437	6.4	84	5.8	5:1
December	326	4.8	48	3.3	7:1
Total	**6826**	**100**	**1436**	**100**	**5:1**

* 1 case missing month information
Source: Canadian Agricultural Injury Surveillance Program

MONTH AND GENDER (%)

Figure 7.8 shows the percentage of hospitalized farm injuries for yearly quarters and gender. Percentage of injuries was higher during the Spring and Summer months, as could be expected with an increase in farming activity during these months. A greater percentage of females were injured between the months of April and July, whereas a slightly greater percentage of males were injured between August and December.

FIGURE 7.8 Proportions of hospitalized farm injuries by month and gender (8263 cases)*



LENGTH OF STAY AND GENDER

Table 7.9 shows the gender distribution of farm injuries by length of stay in the hospital. In excess of 24,000 hospital days were used for the treatment of farm injuries.

TABLE 7.9 Hospitalized farm injuries by length of stay and gender (8263 cases)

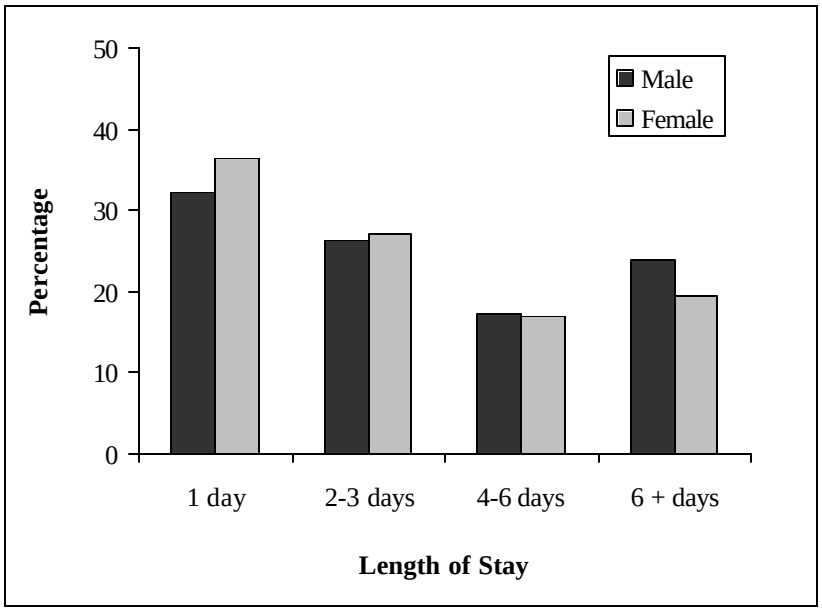
Length	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1 day	2204	32.3	521	36.3	4:1
2-3 days	1805	26.4	391	27.2	5:1
4-6 days	1189	17.4	243	16.9	5:1
6 + days	1629	23.9	281	19.6	6:1
Total	**6827**	**100**	**1436**	**100**	**5:1**

Source: Canadian Agricultural Injury Surveillance Program

LENGTH OF STAY AND GENDER (%)

Figure 7.10 shows the percentage distribution of farm injuries by length of stay in the hospital. For both genders, the greatest proportion of patients were in hospital only one day, however nearly one quarter of male patients were hospitalized for at least 6 days.

FIGURE 7.10 Proportions of hospitalized farm injuries by length of stay and gender (8263 cases)



LOCATION AND GENDER

Table 7.11 shows the gender distribution of hospitalized farm injuries by location of the injury event. Overall, males had nearly five times more hospitalizations than females. Note that information in regards to the location of injury was most often designated as not known.

TABLE 7.11 Hospitalized farm injuries by location and gender (8263 cases)*

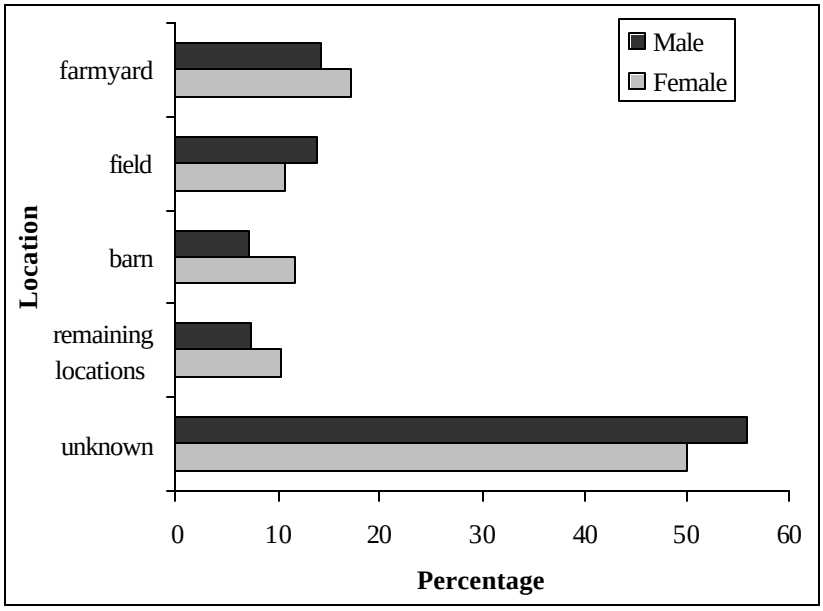
Location	Male		Female		Ratio
	No.	%	No.	%	Male:Female
farmyard	972	14.4	247	17.2	3.9:1
field	943	14.0	153	10.7	6.2:1
barn	494	7.3	167	11.6	5.7:1
silo	62	0.9	**	-	-
shed	56	0.8	16	1.1	3.5:1
farm road	32	0.5	10	0.7	3.2:1
road highway	22	0.3	9	0.6	2.4:1
farm house	19	0.3	7	0.5	2.7:1
water source	18	0.3	**	-	-
driveway	8	0.1	**	-	-
other	287	4.3	100	7.0	2.9:1
unknown	3814	56.7	721	50.2	5.3:1
Total	**6727**	**100**	**1436**	**100**	**4.7:1**

* 100 cases missing location information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

LOCATION AND GENDER (%)

Figure 7.12 shows the percentage of hospitalized farm injuries by location of the injury event. A higher percentage of females were injured in the farmyard as well as the barn whereas the males had a higher percentage of injuries in the field.

FIGURE 7.12 Proportions of hospitalized farm injuries by location and gender (8263 cases)*



DIAGNOSIS AND GENDER

Table 7.13 shows the gender distribution of hospitalized farm injuries by main diagnosis. Males were approximately eight times more likely to have lacerations and nerve damage than females.

TABLE 7.13 Hospitalized farm injuries by diagnosis* and gender (8263 cases)

Diagnosis	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fractures	2659	38.9	619	43.3	4:1
Dislocations	188	2.8	42	2.9	5:1
Sprains/ Strains	323	4.7	70	4.9	5:1
Lacerations	1234	18.1	153	10.7	8:1
Contusions	362	5.3	103	8.6	5:1
Nerve Damage	65	0.6	7	0.6	8:1
Joint Disorders	89	1.3	13	0.9	7:1
Other	1933	28.3	421	29.5	4:1
Total	**6853**	**100**	**1428**	**100**	**5:1**

Source: Canadian Agricultural Injury Surveillance Program

*diagnosis categories are not necessarily mutually exclusive

DIAGNOSIS AND GENDER (%)

Figure 7.14 shows the percentage of hospitalized farm injuries by main diagnosis and gender. Fractures were a common diagnosis, particularly for females. Males experienced a greater proportion of lacerations.

FIGURE 7.14 Proportions of hospitalized farm injuries by diagnosis and gender (8263 cases)

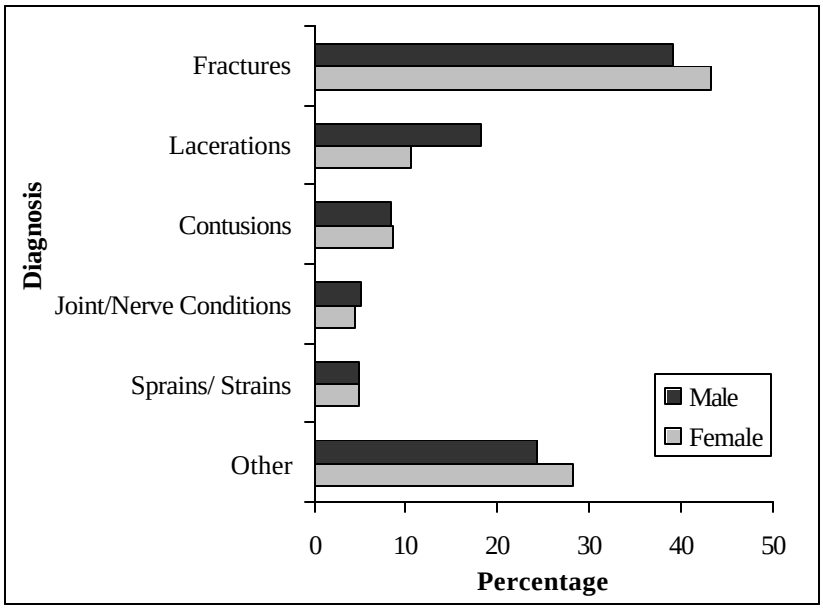


Table 7.15 **Hospitalized farm injuries by primary diagnosis and gender (8263 cases)**

N-code*	Description of N-code	Males		Females	
		No.	%	No.	%
800-804	Fracture: skull	232	3.4	46	3.2
805-809	Fracture: spine and trunk	594	8.7	116	8.1
810-819	Fracture: upper limb	860	12.6	220	15.3
820-829	Fracture: lower limb	969	14.2	237	16.5
830-839	Dislocation	191	2.8	42	2.9
840-849	Sprains/strains of joints and adjacent muscles	321	4.7	70	4.9
850-854	Intracranial injury excl. those with skull fracture	369	5.4	155	10.8
860-869	Internal injury of chest, pelvis and abdomen	212	3.1	42	2.9
870-879	Open wound: head, neck and trunk	205	3.0	30	2.1
880-887	Open wound: upper limb	730	10.7	78	5.4
890-897	Open wound: lower limb	300	4.4	45	3.1
920-924	Contusion with intact skin surface	362	5.3	103	7.2
925-929	Crushing injury	212	3.1	19	1.3
940-949	Burns	205	3.0	22	1.5
950-957	Injury to nerves and spinal cord	41	0.6	7	0.5
958-959	Certain traumatic complications and unspecified injuries	287	4.2	60	4.2
	Other/missing	737	10.8	146	10.2
	Total	**6827**	**100**	**1438**	**100**

Source: Canadian Agricultural Injury Surveillance Program

* based on the nature of injury code from: U.S. Department of Health and Human Services (1989). "The International Classification of Disease, 9th Revision." DHHS Publication No. (PHS) 89-1260

Table 7.15 shows the distribution of machinery farm injuries by major diagnostic category. Only the main diagnosis is reported in this table. For both genders, fractures to the upper and lower limbs were among the most frequently seen primary injuries. Open wounds to the upper limbs were also rather common. (diagnosis categories are not mutually exclusive)

ANATOMICAL SITE AND GENDER

Table 7.16 shows the gender distribution of hospitalized farm injuries according to the anatomical site of the injury. Males were nearly six times more likely to have an upper extremity injury than females.

TABLE 7.16 Hospitalized farm injuries by anatomical site and gender (8263 cases)*

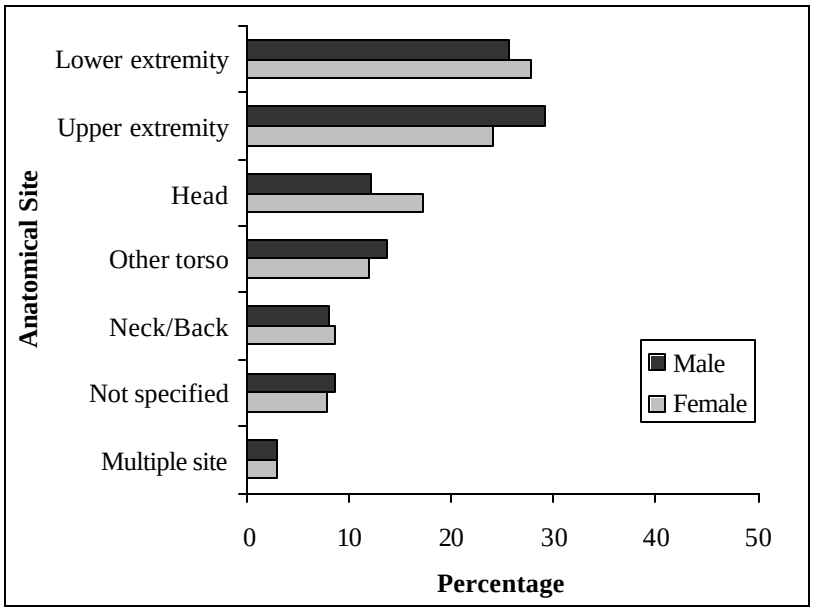
Anatomical site	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Lower extremity	1736	25.6	395	27.7	4:1
Upper extremity	1981	29.2	343	24.0	6:1
Head	811	12.0	245	17.2	3:1
Other torso	922	13.6	170	11.9	5:1
Lower back	252	3.7	71	5.0	4:1
Multiple site	206	3.0	40	2.8	5:1
Upper back	208	3.1	39	2.7	5:1
Neck	73	1.1	13	0.9	6:1
Not specified	591	8.7	112	7.8	5:1
Total	**6780**	**100**	**1428**	**100**	**5:1**

* 55 cases missing anatomical site information
Source: Canadian Agricultural Injury Surveillance Program

ANATOMICAL SITE AND GENDER (%)

Figure 7.17 shows the percentage of hospitalized farm injuries considering the anatomical site of the injury and gender. Injuries to the extremities composed approximately fifty percent of the injuries for both males and females. Head injuries were proportionally greater for females than for their male counterparts.

FIGURE 7.17 Proportions of hospitalized farm injuries by anatomical site and gender (8263 cases)*



8.0 GENDER ANALYSIS OF HOSPITALIZED FARM MACHINERY INJURIES

RATE AND GENDER

MALES

Table 8.1 shows the rate of hospitalization for males due to machinery farm injuries. The rate increased steadily with age.

TABLE 8.1 Estimated Rate of Hospitalized farm machinery injuries among males by age (3644 cases)*

MALES					
Age	**Hospitalization**		**Farm Populationϕ**		**Rate/100,000/yr**
	No.	**%**	**No.**	**%**	
0-9	236	6.7	66611	14.5	70.9
10-19	360	10.2	84944	18.5	84.8
20-29	379	10.7	51165	11.1	148.1
30-39	563	15.9	63639	13.8	176.9
40-49	551	15.5	68321	14.9	161.3
50-59	528	14.9	58985	12.8	179.0
60-69	537	15.2	44355	9.6	242.1
70+	390	11.0	21502	4.7	362.8
Total	**3544**	**100**	**459521**	**100**	**154.2**

* 100 cases missing age information

Source: Canadian Agricultural Injury Surveillance Program

ϕ Statistics Canada, Census of Agriculture, interpolated 1993

FEMALES

Table 8.2 shows the rate of hospitalization for females due to machinery farm injuries. The rate was lowest for individuals between the ages of 10 and 19 years of age.

TABLE 8.2 Estimated Rate of Hospitalized farm machinery injuries among females by age (398 cases)*

FEMALES					
Age	**Hospitalization**		**Farm Populationϕ**		**Rate/100,000/yr**
	No.	**%**	**No.**	**%**	
0-9	70	18.0	62679	15.6	22.3
10-19	59	15.2	76605	19.2	15.4
20-29	39	10.0	39132	9.7	19.9
30-39	55	14.1	61066	15.2	18.0
40-49	60	15.4	64849	16.2	18.5
50-59	62	15.9	51062	12.7	24.3
60-69	34	8.7	31057	7.7	21.9
70+	10	2.6	14949	3.7	13.4
Total	**389**	**100**	**401403**	**100**	**19.4**

* 9 cases missing age information

Source: Canadian Agricultural Injury Surveillance Program

ϕ Statistics Canada, Census of Agriculture, interpolated 1993

AGE AND GENDER

Table 8.3 shows the gender distribution of farm machinery injuries by age. Males had nine times as many farm machine injuries. The male-to-female ratios generally increased with age to an extreme value of 39:1 for the oldest age group.

TABLE 8.3 Hospitalized farm machinery injuries by age and gender (4042 cases)*

Age	Male		Female		Ratio
	No.	%	No.	%	Male:Female
0-9	236	6.7	70	18.0	3:1
10-19	360	10.2	59	15.2	6:1
20-29	379	10.7	39	10.0	10:1
30-39	563	15.9	55	14.1	10:1
40-49	551	15.5	60	15.4	9:1
50-59	528	14.9	62	15.9	9:1
60-69	537	15.2	34	8.7	16:1
70+	390	11.0	10	2.6	39:1
Total	**3544**	**100**	**389**	**100**	**9:1**

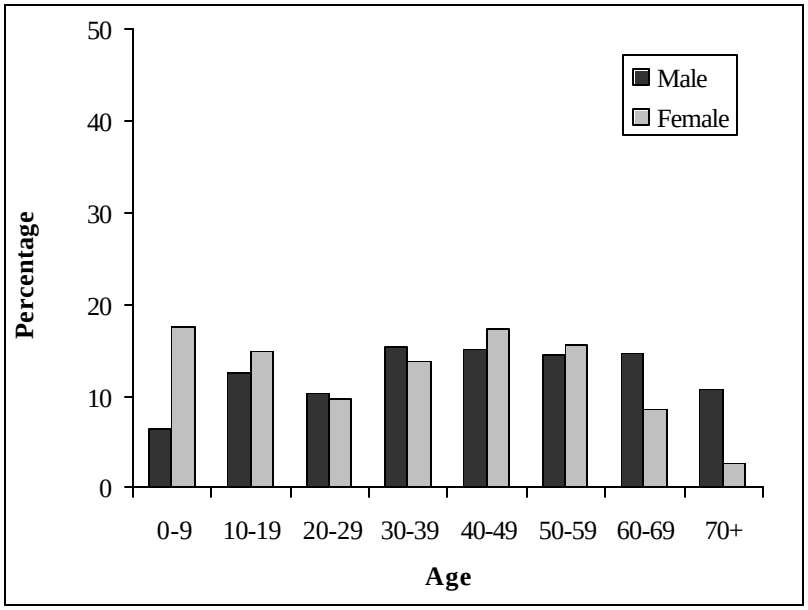
* 109 cases missing age information

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 8.4 shows the percent distribution of farm machinery injuries by age and gender. For individuals between the ages of 10 and 59, the proportion of males and females injured was almost equal within each age group. Young girls and older men had relatively higher percentage of machinery related injuries.

FIGURE 8.4 Proportions of hospitalized farm machinery injuries by age and gender (4042 cases)*



FISCAL YEAR AND GENDER

Table 8.5 shows the gender distribution of farm machinery injuries according to gender by each fiscal year during the time frame of this study. The male-to-female ratio of hospitalized farm machinery injuries remained relatively stable throughout the study. Due to the short period of study, a general trend cannot be concluded.

TABLE 8.5 Hospitalized farm machinery injuries by fiscal year and gender (4042 cases)

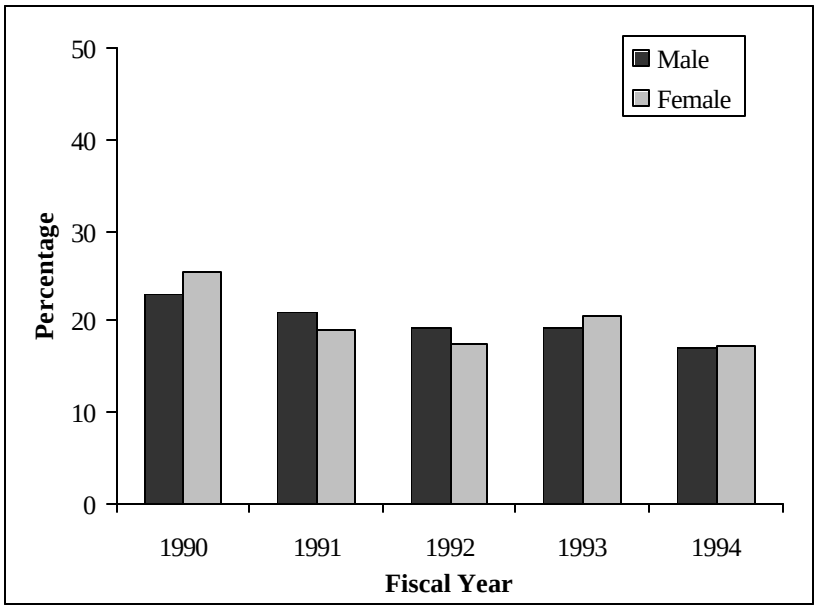
Fiscal Year	Male		Female		Ratio
	No.	% .	No.	%	Male:Female
1990	838	23.0	101	25.4	8:1
1991	769	21.1	76	19.1	10:1
1992	703	19.3	70	17.6	10:1
1993	707	19.4	82	20.6	9:1
1994	627	17.2	69	17.3	9:1
Total	**3644**	**100**	**398**	**100**	**9:1**

Source: Canadian Agricultural Injury Surveillance Program

FISCAL YEAR AND GENDER (%)

Figure 8.6 shows the distribution of hospitalized farm machinery injuries by gender within each fiscal year. The percentage of males and females hospitalized for machinery-related injury was relatively equal each year, ranging from approximately 17% to 25% for both genders.

FIGURE 8.6 Proportions of hospitalized farm machinery injuries by fiscal year and gender (4042 cases)



LENGTH OF STAY AND GENDER

Table 8.7 shows the gender distribution of machinery farm injuries by length of stay in the hospital. In excess of 12,000 hospital days were used for the treatment of machinery farm injuries.

TABLE 8.7 **Hospitalized farm machinery injuries by length of stay and gender (4042 cases)**

Length of Stay	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1 day	1054	29.0	128	32.2	8:1
2-3 days	961	26.4	87	21.9	11:1
4-6 days	616	16.9	77	19.3	8:1
6+ days	1013	27.8	106	26.6	10:1
Total	**3644**	**100**	**398**	**100**	**9:1**

Source: Canadian Agricultural Injury Surveillance Program

LENGTH OF STAY AND GENDER (%)

Figure 8.8 shows the percentage distribution of machinery farm injuries by length of stay in the hospital. For both genders, the greatest proportion of patients were in hospital only one day, however more than one quarter of patients were hospitalized for at least 6 days.

FIGURE 8.8 **Proportions of hospitalized farm machinery injuries by length of stay and gender (4042 cases)**

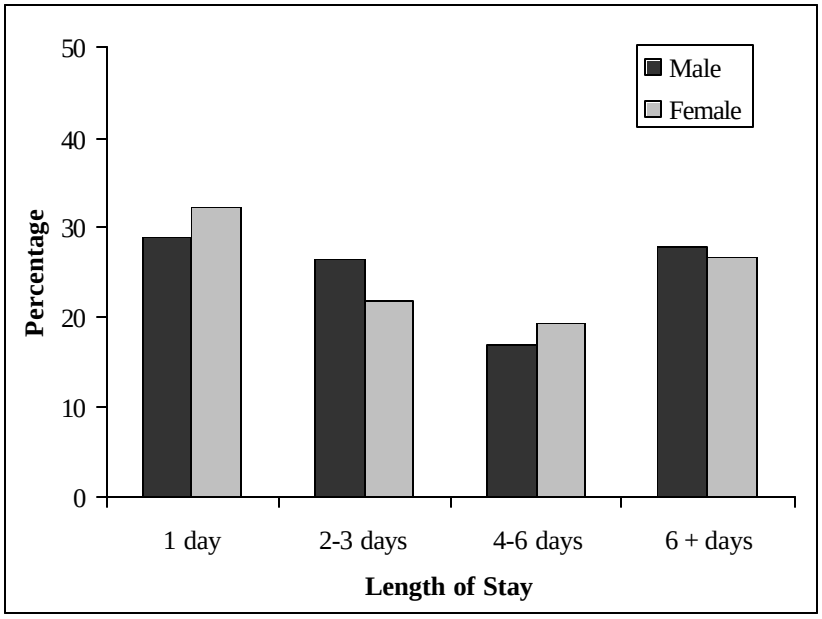


Table 8.9 Hospitalized machinery farm injuries by primary diagnosis and gender (4042 cases)

N-code*	Description of N-code	Male		Female	
		No.	%	No.	%
800-804	Fracture: skull	91	2.5	10	2.5
805-809	Fracture: spine and trunk	328	9.0	31	7.8
810-819	Fracture: upper limb	561	15.4	74	18.6
820-829	Fracture: lower limb	503	13.8	64	16.1
830-839	Dislocation	76	2.1	6	1.5
840-848	Sprains/strains of joints and adjacent muscles	91	2.5	14	3.5
850-854	Intracranial injury excl. those with skull fracture	149	4.1	22	5.5
860-869	Internal injury of chest, pelvis and abdomen	117	3.2	7	1.8
870-879	Open wound: head, neck and trunk	109	3.0	10	2.5
880-887	Open wound: upper limb	605	16.6	49	12.3
890-897	Open wound: lower limb	208	5.7	18	4.5
920-924	Contusion with intact skin surface	179	4.9	25	6.3
925-929	Crushing injury	182	5.0	13	3.3
940-949	Burns	47	1.3	**	-
950-957	Injury to nerves and spinal cord	26	0.7	**	-
958-959	Certain traumatic complications and unspecified injuries	164	4.5	23	5.8
	Other/missing	208	5.7	27	6.8
	Total	**3644**	**100**	**398**	**100**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

* based on the nature of injury code from: U.S. Department of Health and Human Services (1989). "The International Classification of Disease, 9th Revision." DHHS Publication No. (PHS) 89-1260

Table 8.9 shows the distribution of machinery farm injuries by major diagnostic category. Only the main diagnosis is reported in this table. For both genders, fractures to the upper and lower limbs were among the most frequently seen primary injuries. Open wounds to the upper limbs were also rather common. (diagnosis categories are not mutually exclusive)

DIAGNOSIS AND GENDER

Table 8.10 shows the gender distribution of hospitalized farm machinery injuries by main diagnosis. Males had approximately twelve times more dislocations and lacerations than their female counterparts. (diagnosis categories are not mutually exclusive)

TABLE 8.10 Hospitalized farm machinery injuries by diagnosis and gender (4042 cases)

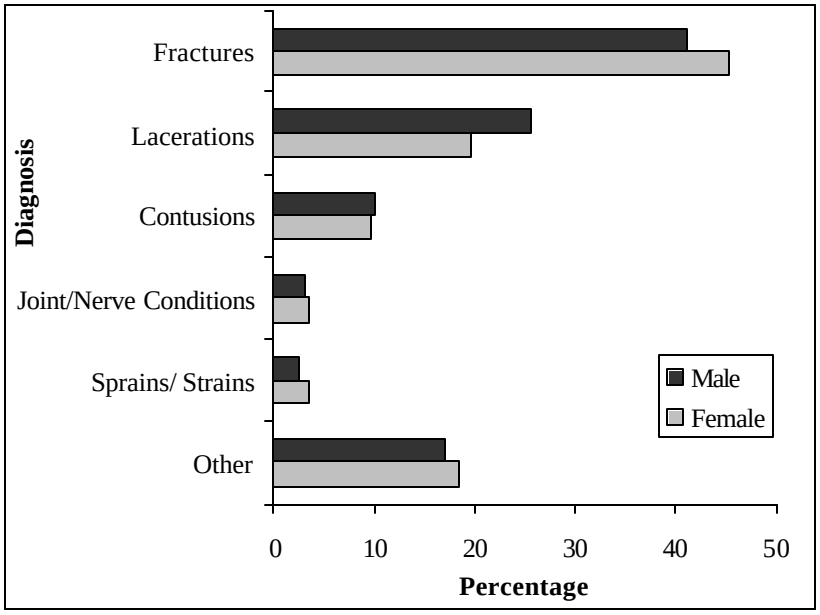
Diagnosis	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fractures	1483	40.7	179	45.0	8:1
Dislocations	76	2.1	6	1.5	13:1
Sprains/ Strains	91	2.5	14	3.5	6:1
Lacerations	922	25.3	77	19.3	12:1
Contusions	179	4.9	25	9.6	10:1
Joint Disorders	29	0.8	**	-	7:1
Nerve Damage	26	0.7	**	-	9:1
Other	838	23.0	89	22.4	9:1
Total	**3644**	**100**	**398**	**100**	**9:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

DIAGNOSIS AND GENDER (%)

Figure 8.11 shows the percentage of hospitalized farm machinery injuries by main diagnosis and gender. Fractures were most common diagnosis for both males and females, however females having a slightly higher proportion of these injuries. Males experienced a slightly greater proportion of lacerations.

FIGURE 8.11 Proportions of hospitalized farm machinery injuries diagnosis and gender (4042 cases)



ANATOMICAL SITE AND GENDER

Table 8.12 shows the gender distribution of hospitalized farm machinery injuries by the anatomical site of the injury. Males had nearly thirteen times more torso injuries than their female counterparts. Females had no injuries categorized as "Multiple site" injuries. (anatomical site categories are not mutually exclusive)

TABLE 8.12 Hospitalized farm machinery injuries by anatomical site and gender (4042 cases)*

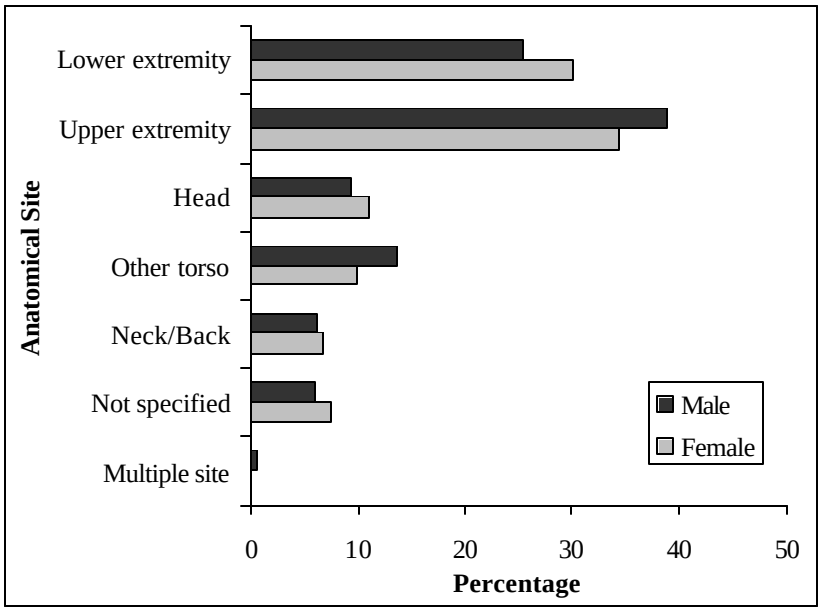
Anatomical site	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Lower extremity	918	25.4	119	30.1	8:1
Upper extremity	1401	38.8	136	34.4	10:1
Head	339	9.4	44	11.1	8:1
Other torso	490	13.6	39	9.9	13:1
Lower back	87	2.4	11	2.8	8:1
Multiple site	22	0.6	0	0.0	-
Upper back	99	2.7	12	3.0	8:1
Neck	38	1.1	**	-	-
Not specified	221	6.1	30	7.6	7:1
Total	**3615**	**100**	**395**	**100**	**9:1**

* 32 cases missing anatomical site information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

ANATOMICAL SITE AND GENDER (%)

Figure 8.13 shows the percentage of hospitalized farm machinery injuries considering the anatomical site of the injury and gender. Injuries to the extremities composed the majority of the injuries for both males and females. Males had a greater percentage of upper extremity injuries. Whereas females had a greater percentage of injuries to the lower extremities.

FIGURE 8.13 Proportions of hospitalized farm machinery injuries by anatomical site and gender (4042 cases)*



MECHANISM OF INJURY AND GENDER

Table 8.14 shows the gender distribution of hospitalized farm machinery injuries considering the mechanism of injury. Males had twelve times more injuries due to being caught in/entangled, pinned or struck by machine, struck by falling or projected object.

TABLE 8.14 Hospitalized farm machinery injuries by mechanism of injury and gender (4042 cases)

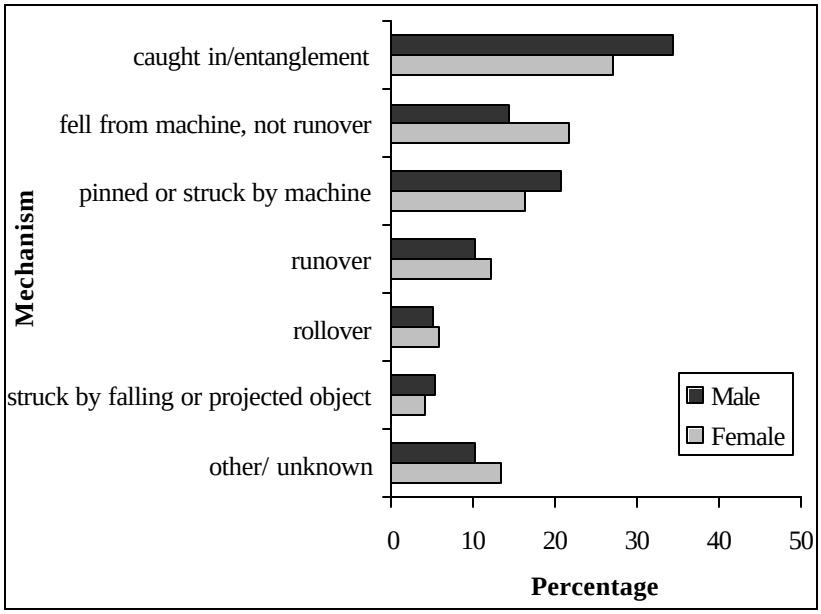
Mechanism	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Caught in /entanglement	1253	34.4	107	26.9	12:1
Fell from machine, not run over	525	14.4	86	21.6	6:1
Pinned or struck by machine	751	20.6	65	16.3	12:1
Run over	372	10.2	48	12.1	8:1
Rollover	178	4.9	23	5.8	8:1
Struck by falling or projected object	198	5.4	16	4.0	12:1
Motor vehicle	33	0.9	10	2.5	3:1
Other/ unknown	334	9.2	43	10.8	8:1
Total	**3644**	**100**	**398**	**100**	**9:1**

Source: Canadian Agricultural Injury Surveillance Program

MECHANISM OF INJURY AND GENDER (%)

Figure 8.15 shows the percentage of hospitalized farm injuries by mechanism of injury and gender. Entanglement was the most common mechanism of injury, especially for males, whereas females were often injured from falling off machinery.

FIGURE 8.15 Hospitalized farm machinery injuries in Canada by mechanism of injury and gender (4042 cases)



MACHINE TYPE AND GENDER

Table 8.16 shows the gender distribution of hospitalized farm machinery injuries by machine type. Some machinery with high male-to-female ratios include fence equipment, swathers, chainsaws, combines and balers. Note that tractors were the dominant cause of injury for both males and females and there was much less discrepancy between sexes when recreation vehicles were involved.

TABLE 8.16 Hospitalized farm machinery injuries by machine type and gender (4042 cases)

Machine Type	Male		Female		Ratio
	No.	%	No.	%	Male:Female
tractor	1015	27.9	112	28.1	9:1
motor vehicle	185	5.1	34	8.5	5:1
combine	335	9.2	14	3.5	24:1
grain auger	237	6.5	21	5.3	11:1
power take off	201	5.5	19	4.8	11:1
recreation vehicle	81	2.2	29	7.3	3:1
farm wagon	103	2.8	23	5.8	5:1
harvester	104	2.9	17	4.3	6:1
plough disk	113	3.1	14	3.5	8:1
baler	151	4.1	7	1.8	22:1
hay elevator	53	1.5	13	3.3	4:1
swather	94	2.6	**	-	-
auger (unspecified)	101	2.8	**	-	-
power tool	82	2.3	**	-	-
fence equipment	72	2.0	**	-	-
plant equipment	26	0.7	7	1.8	4:1
manure spreader	38	1.0	**	-	-
garden equipment	22	0.6	5	1.3	4:1
lawn mower	26	0.7	**	-	-
chainsaw	31	0.9	**	-	-
mower	28	0.8	5	1.3	6:1
spray equipment	8	0.2	**	-	-
welder	**	-	0	0.0	-
unknown	188	5.2	15	3.8	13:1
other farm implement	347	9.5	41	10.3	9:1
Total	**3644**	**100**	**398**	**100**	**9:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

9.0 GENDER ANALYSIS OF HOSPITALIZED NON-MACHINERY FARM INJURIES

RATE AND GENDER

MALES

Table 9.1 shows the rate of hospitalization for males due to non-machinery farm injuries. The rate increased steadily with age, as there was more than a three-fold increase between males under the age of 9 and those over the age of 70.

TABLE 9.1 Estimated rate of hospitalized non-machinery farm injuries by age and gender (4221 cases)

MALES					
Age	**Hospitalization**		**Farm Populationϕ**		**Rate/100,000/yr**
	No.	**%**	**No.**	**%**	
0-9	212	6.7	66611	14.5	63.7
10-19	349	11.0	84944	18.5	82.2
20-29	357	11.2	51165	11.1	139.5
30-39	579	18.2	63639	13.8	182.0
40-49	542	17.0	68321	14.9	158.7
50-59	468	14.7	58985	12.8	158.7
60-69	423	13.3	44355	9.6	190.7
70+	253	7.9	21502	4.7	235.3
Total	**3183**	**100**	**459521**	**100**	**138.5**

Source: Canadian Agricultural Injury Surveillance Program
ϕ Statistics Canada, Census of Agriculture, interpolated 1993

FEMALES

Table 9.2 shows the rate of hospitalization for females due to non-machinery farm injuries. The rate increased steadily with age as the rate nearly tripled between females under the age of 9 and those over the age of 70.

FEMALES					
Age	**Hospitalization**		**Farm Populationϕ**		**Rate/100,000/yr**
	No.	**%**	**No.**	**%**	
0-9	107	10.3	62679	15.6	34.1
10-19	169	16.3	76605	19.2	44.1
20-29	104	10.0	39132	9.7	53.2
30-39	190	18.3	61066	15.2	62.2
40-49	161	15.5	64849	16.2	49.7
50-59	123	11.8	51062	12.7	48.2
60-69	108	10.4	31057	7.7	69.5
70+	76	7.3	14949	3.7	101.7
Total	**1038**	**100**	**401403**	**100**	**51.7**

Source: Canadian Agricultural Injury Surveillance Program
ϕ Statistics Canada, Census of Agriculture, interpolated 1993

AGE AND GENDER

Table 9.3 shows the gender distribution of non-machinery farm injuries by age group. In total, male injuries were approximately three times more frequent than female injuries. The male-to-female ratio increased only slightly between the younger and older age groups.

TABLE 9.3 Hospitalized non-machinery farm injuries by age and gender (4221 cases)

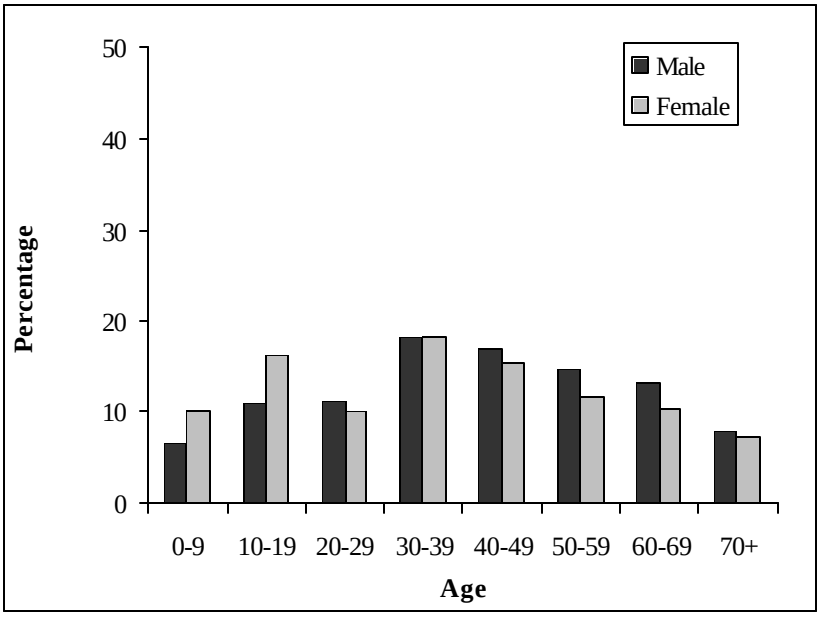
Age	Male		Female		Ratio
	No.	%	No.	%	Male:Female
0-9	212	6.7	107	10.3	2:1
10-19	349	11.0	169	16.2	2:1
20-29	357	11.2	104	10.0	3:1
30-39	579	18.2	190	18.3	3:1
40-49	542	17.0	161	15.5	3:1
50-59	468	14.7	123	11.8	4:1
60-69	423	13.3	108	10.4	4:1
70+	253	7.9	76	7.3	3:1
Total	**3183**	**100**	**1038**	**100**	**3:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 9.4 shows the percentage distribution of non-machinery farm injuries according to age group and gender. Under the age of twenty, girls had a relatively higher percentage of injuries. The highest proportion of injuries for both genders was between the ages of 30 and 39.

FIGURE 9.4 Proportions of hospitalized non-machinery farm injuries by age and gender (4221 cases)



FISCAL YEAR AND GENDER

Table 9.5 shows the distribution of non-machinery farm injuries according to gender by each fiscal year. The male-to-female ratio was relatively stable but due to the short period of study, a general trend cannot be concluded.

TABLE 9.5 Hospitalized non-machinery farm injuries by fiscal year and gender (4221 cases)

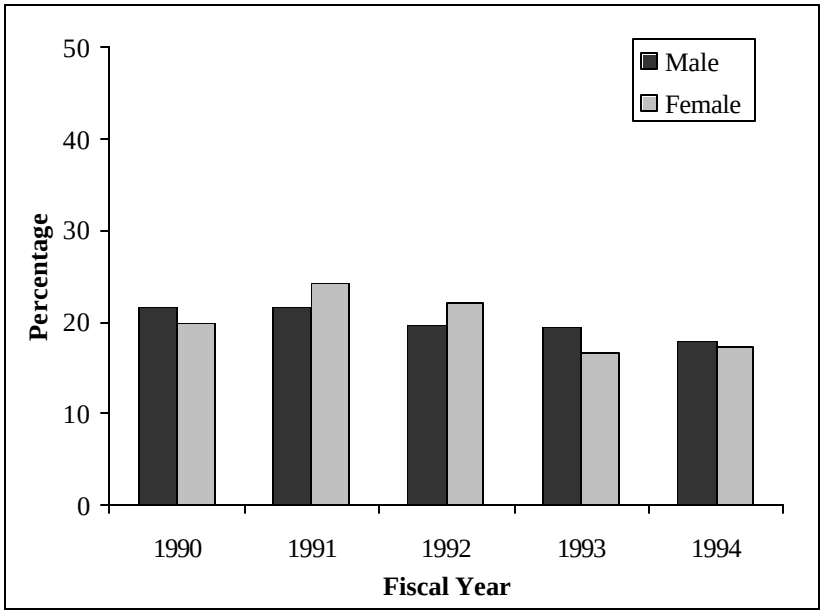
Fiscal Year	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1990	684	21.5	205	19.7	3:1
1991	688	21.6	252	24.3	3:1
1992	623	19.6	228	22.0	3:1
1993	618	19.4	173	16.7	4:1
1994	570	17.9	180	17.3	3:1
Total	**3183**	**100**	**1038**	**100**	**3:1**

Source: Canadian Agricultural Injury Surveillance Program

FISCAL YEAR AND GENDER (%)

Figure 9.6 shows the distribution of hospitalized non-machinery farm injuries by gender within each fiscal year during the timeframe of this study. While the percentage of non-machinery injury to males was relatively stable, slight decreases were observed for females in the most recent two years.

FIGURE 9.6 Proportions of hospitalized non-machinery farm injuries by fiscal year and gender (4221 cases)



LENGTH OF STAY AND GENDER

Table 9.7 shows the gender distribution of non-machinery farm injuries by length of stay in the hospital. In excess of 11,000 hospital days were used for the treatment of non-machinery farm injuries.

TABLE 9.7 **Hospitalized non-machinery farm injuries by length of stay and gender (4221 cases)**

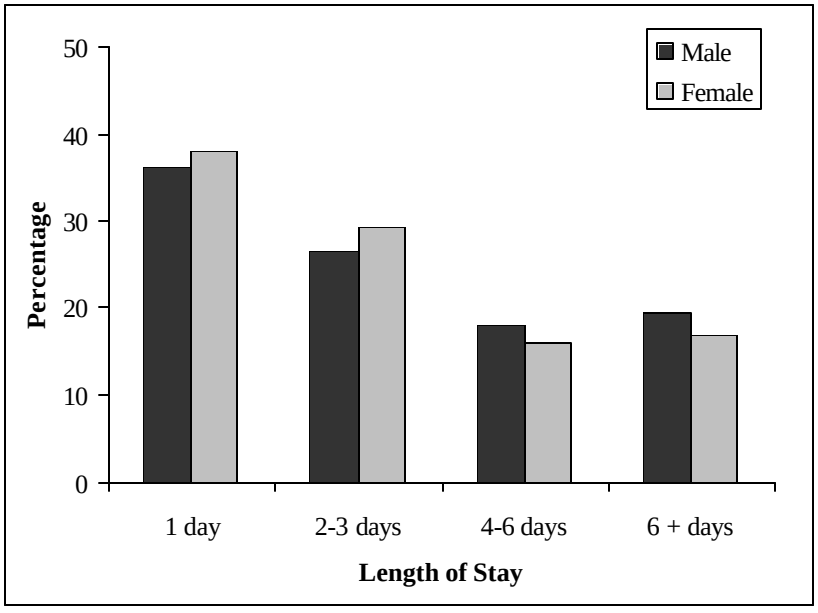
Length Of Stay	Male		Female		Ratio
	No.	%	No.	%	Male:Female
1 day	1150	36.1	393	37.9	3:1
2-3 days	844	26.5	304	29.3	3:1
4-6 days	573	18.0	166	16.0	4:1
6+ days	616	19.4	175	16.9	4:1
Total	**3183**	**100**	**1038**	**100**	**3:1**

Source: Canadian Agricultural Injury Surveillance Program

LENGTH OF STAY AND GENDER (%)

Figure 9.8 shows the percentage distribution of non-machinery farm injuries by length of stay in the hospital. For both genders, the greatest proportion of patients were in hospital only one day, however nearly one quarter of patients were hospitalized for at least 6 days.

FIGURE 9.8 **Proportions of hospitalized non-machinery farm injuries by length of stay and gender (4221 cases)**



LOCATION AND GENDER

Table 9.9 shows the distribution of non-machinery farm injuries by location of the event leading to injury according to gender. The farmyard and barn were the most common location for both genders. The farmhouse appeared to be of slightly higher risk to females.

TABLE 9.9 Hospitalized non-machinery farm injuries by location and gender (4221 cases)

Location	Male		Female		Ratio
	No.	%	No.	%	Male:Female
farmyard	610	19.2	199	19.2	3:1
field	302	9.5	79	7.6	4:1
barn	411	12.9	158	15.2	3:1
shed	30	0.9	13	1.3	2:1
farm road	7	0.2	6	0.6	1:1
silo	32	1.0	**	-	-
road highway	5	0.2	7	0.7	1:1
farm house	12	0.4	5	0.5	2:1
water source	13	0.4	**	-	-
driveway	**	-	**	-	-
other	217	6.8	76	7.3	3:1
unknown	1540	48.4	490	47.2	3:1
Total	**3183**	**100**	**1038**	**100**	**3:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

Table 9.10 Hospitalized non-machinery farm injuries by primary diagnosis and gender (4221 cases)

N-code*	Description of N-code	Male		Female	
		No.	%	No.	%
800-804	Fracture: skull	143	4.5	36	3.5
805-809	Fracture: spine and trunk	267	8.4	85	8.2
810-819	Fracture: upper limb	299	9.4	145	14.0
820-829	Fracture: lower limb	465	14.6	173	16.7
830-839	Dislocation	112	3.5	36	3.4
840-848	Sprains/strains of joints and adjacent muscles	233	7.3	56	5.4
850-854	Intracranial injury excl. those with skull fracture	220	6.9	133	12.8
860-869	Internal injury of chest, pelvis and abdomen	93	2.9	35	3.4
870-879	Open wound: head, neck and trunk	93	2.9	20	1.9
880-887	Open wound: upper limb	124	3.9	29	2.8
890-897	Open wound: lower limb	96	3.0	26	2.5
920-924	Contusion with intact skin surface	181	5.7	79	7.6
925-929	Crushing injury	29	0.9	6	0.6
940-949	Burns	156	4.9	21	2.0
950-957	Injury to nerves and spinal cord	16	0.5	**	-
958-959	Certain traumatic complications and unspecified injuries	124	3.9	37	3.6
	Other/missing	532	16.7	119	11.5
	Total	**3183**	**100**	**1038**	**100**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

* based on the nature of injury code from: U.S. Department of Health and Human Services (1989). "The International Classification of Disease, 9th Revision." DHHS Publication No. (PHS) 89-1260

Table 9.10 shows the distribution of non-machinery farm injuries by major diagnostic category. Only the main diagnosis is reported in this table. Fractures to the upper and lower limbs were the most frequent primary injuries seen. Spine and truck fractures as well as intracranial injury were also rather common, more so for females. (diagnosis categories are not mutually exclusive)

DIAGNOSIS AND GENDER

Table 9.11 shows the gender distribution of hospitalized non-machinery farm injuries by main diagnosis. Males were approximately seven times more likely to have nerve damage and joint disorders than females.

TABLE 9.11 Hospitalized non-machinery farm injuries by diagnosis* and gender (4221 cases)

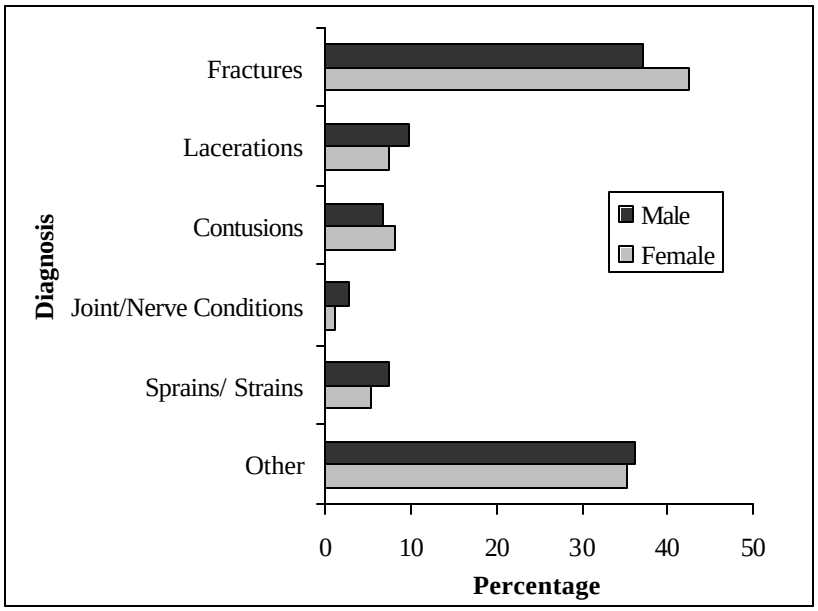
Diagnosis	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fractures	1176	37.2	439	42.5	3:1
Dislocations	112	3.5	35	3.4	3:1
Sprains/ Strains	233	7.4	56	5.4	4:1
Lacerations	311	9.8	75	7.3	4:1
Contusions	182	5.7	79	7.6	2:1
Joint Disorders	60	1.9	9	0.9	7:1
Nerve Damage	29	0.9	**	-	-
Other	1091	34.3	342	32.9	3:1
Total	**3194**	**100**	**1038**	**100**	**3:1**

* diagnosis categories are not mutually exclusive
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

DIAGNOSIS AND GENDER (%)

Figure 9.12 shows the distribution of hospitalized non-machinery farm injuries by gender considering diagnosis. Fractures were the more common diagnosis, especially for females. Males had the greatest proportion of lacerations and sprains/strains while females had a slightly higher percentage of contusions.

FIGURE 9.12 Proportions of hospitalized non-machinery farm injuries by diagnosis and gender (4221 cases)



ANATOMICAL SITE AND GENDER

Table 9.13 shows the distribution of hospitalized non-machinery farm injuries according to the anatomical site of injury. Males are nearly five times more likely to have injury involving multiple sites, yet they are only about twice as likely to have a head injury compared to females.

TABLE 9.13 Hospitalized non-machinery farm injuries by anatomical site and gender (4221 cases)*

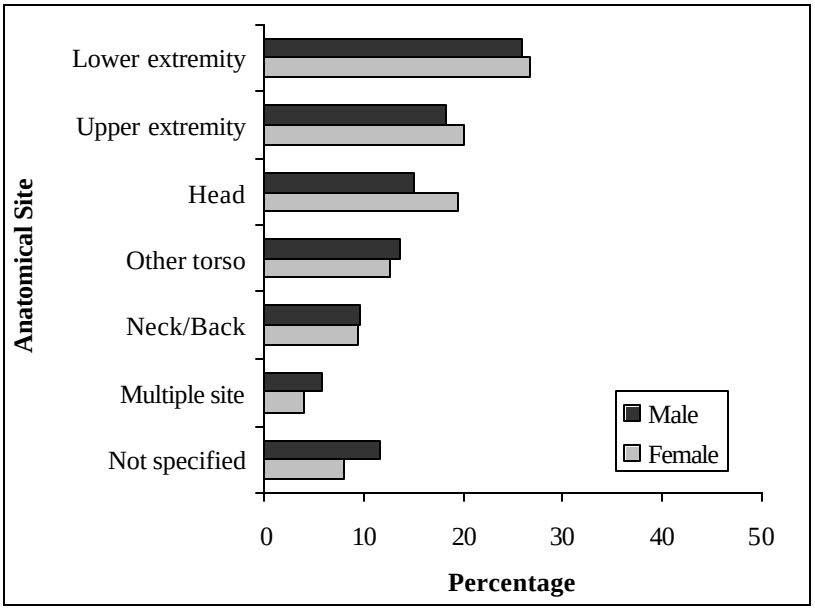
Anatomical site	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Lower extremity	818	25.8	276	26.7	3:1
Upper extremity	580	18.3	207	20.0	3:1
Head	472	14.9	201	19.5	2:1
Other torso	432	13.6	131	12.7	3:1
Lower back	165	5.2	60	5.8	3:1
Multiple site	184	5.8	40	3.9	5:1
Upper back	109	3.4	27	2.6	4:1
Neck	35	1.1	9	0.9	4:1
Not specified	370	11.7	82	7.9	5:1
Total	**3165**	**100**	**1033**	**100**	**3:1**

* 23 cases missing anatomical site information
Source: Canadian Agricultural Injury Surveillance Program

ANATOMICAL SITE AND GENDER (%)

Figure 9.14 shows the distribution of hospitalized non-machinery farm injuries considering the anatomical site of the injury. Injuries to the extremities composed nearly fifty percent of the injuries for both males and females. Head injuries were proportionally greater for females than for males.

FIGURE 9.14 Proportions of hospitalized non-machinery farm injuries by anatomical site and gender (4221 cases)*



ANIMAL TYPE AND GENDER

Table 9.15 shows the gender distribution of hospitalized farm injuries caused by animals according to type of animal involved. Overall, males had approximately twice as many injuries involving farm animals than females. Injury involving pigs was nearly five times more common among males, however injuries involving horses were nearly as common for males as for females.

TABLE 9.15 Hospitalized non-machinery farm injuries by animal type and gender (1578 cases)

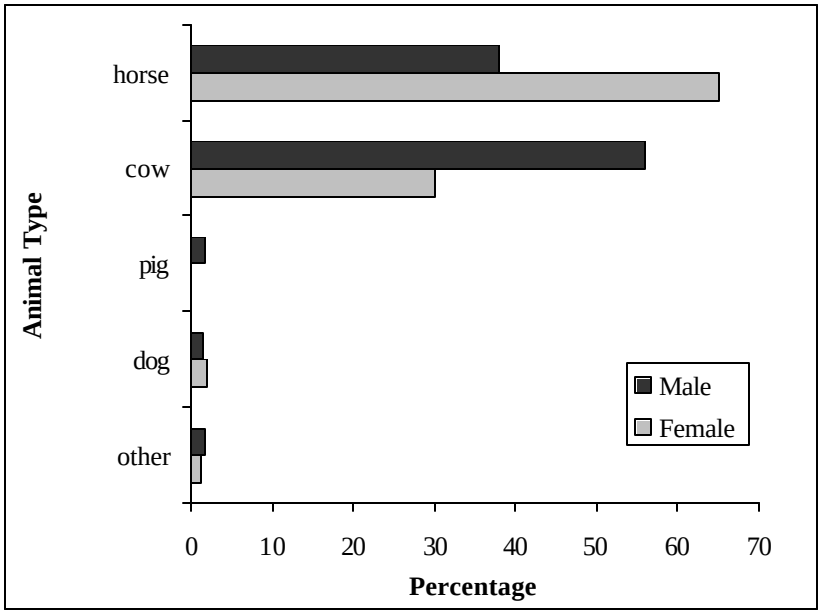
Animal	Male		Female		Ratio
	No.	%	No.	%	Male:Female
horse	412	38.0	321	65.0	1:1
cow	607	56.0	148	30.0	4:1
pig	18	1.7	**	-	-
dog	16	1.5	10	2.0	2:1
sheep	9	0.8	**	-	-
other	18	1.7	6	1.2	3:1
unspecified	**	-	**	-	-
Total	**1084**	**100**	**494**	**100**	**2:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

ANIMAL TYPE AND GENDER

Figure 9.16 shows the percentage of hospitalized farm injuries caused by animals. Cows were the cause of a majority of animal injuries, followed by horses or males. In contrast, horses were involved in almost two-thirds of animal-related injuries for females.

FIGURE 9.16 Proportions of hospitalized non-machinery farm injuries by animal type and gender (1578 cases)



CAUSE AND GENDER

Table 9.17 shows the distribution of hospitalized non-machinery farm injuries by cause. Males were approximately seven times more likely to have injury involving fires compared to their female counterparts.

TABLE 9.17 Hospitalized non-machinery farm injuries by cause and gender (4221 cases)

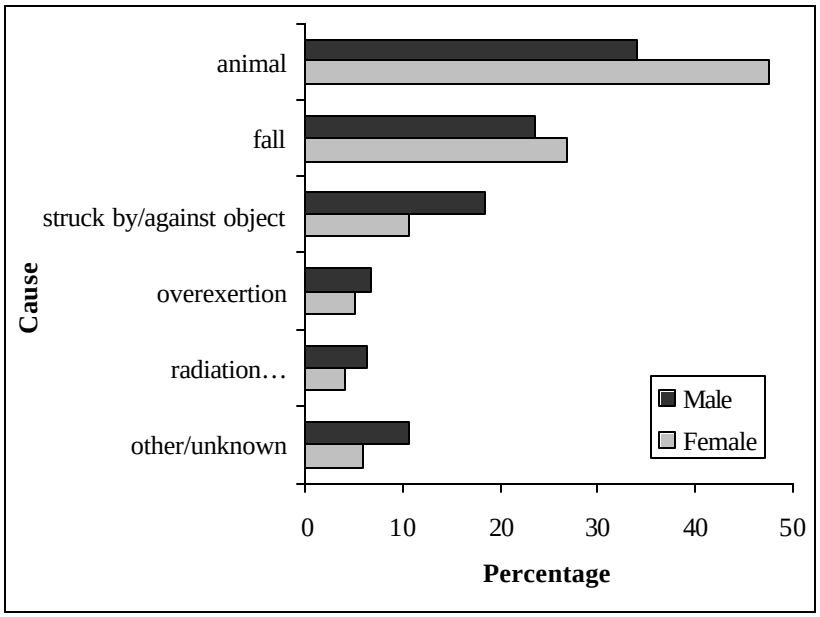
Cause	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Animal	1084	34.2	494	47.6	2:1
Fall	755	23.7	279	26.9	3:1
Struck by/against object	589	18.5	110	10.6	5:1
Overexertion	213	6.7	52	5	4:1
Radiation, toxic/noxious substances	204	6.4	42	4	5:1
Fires	113	3.6	16	1.5	7:1
Caught in/under/between objects	74	2.3	15	1.4	5:1
Temperature extremes	23	0.7	9	0.9	3:1
Electric current	19	0.6	**	-	6:1
Other/ unknown	109	3.4	18	1.7	6:1
Total	**3183**	**100**	**1038**	**100**	**3:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

CAUSE AND GENDER

Figure 9.18 shows the distribution of hospitalized non-machinery farm injuries considering the cause of the injury. A large proportion of injuries to females were caused by animals or falls, whereas a greater percentage of males were injured by being struck by/against an object.

FIGURE 9.18 Proportions of hospitalized non-machinery farm injuries by cause and gender (4221 cases)



10.0 HOSPITALIZED FARM INJURIES: BY AGE GROUP

10.1 AGES 0 TO 14 YEARS

AGE AND GENDER

Table 10.1.1 shows the gender distribution of hospitalized farm injuries by age for individuals aged 0-14 years. For both genders, the incidence of hospitalizations increased with age. The male-to-:female ratio value of 2.5:1 demonstrates that there was a rather small gap between genders with respect to the frequency of hospitalization of children.

TABLE 10.1.1 Hospitalized farm injuries among children (0-14 yrs), by age and gender (1094 cases)

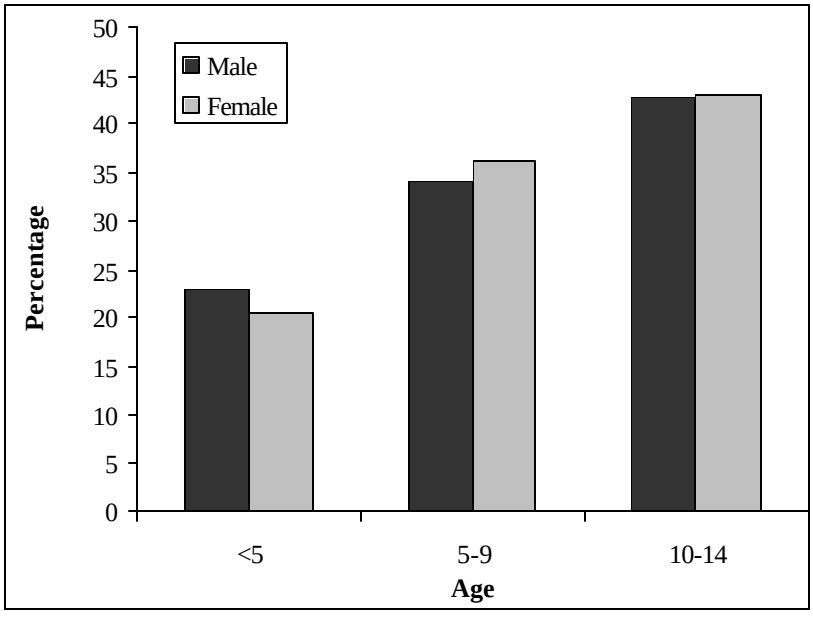
	Male		Female		Ratio
Age	**No.**	**%**	**No.**	**%**	**Male:Female**
<5	180	23.0	64	20.6	3:1
5-9	268	34.2	113	36.3	2:1
10-14	335	42.8	134	43.1	3:1
Total	**783**	**100**	**311**	**100**	**3:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 10.1.2 shows the distribution of hospitalized farm machinery injuries by age and gender for individuals aged 0-14 years. The proportions were nearly equal for both boys and girls at any given age and for both genders, hospitalization increased with age.

FIGURE 10.1.2 Proportions of hospitalized farm injuries among children (0-14 yrs), by age and gender (1094 cases)



AGES 0 TO 14 YEARS

MONTH AND GENDER

Table 10.1.3 shows the gender distribution of hospitalized farm injuries by month for individuals aged 0-14 years. For both genders, there was an increase in the number of injuries between the months of April and September.

TABLE 10.1.3 Hospitalized farm injuries among children (0-14 yrs), by month and gender (1094 cases)

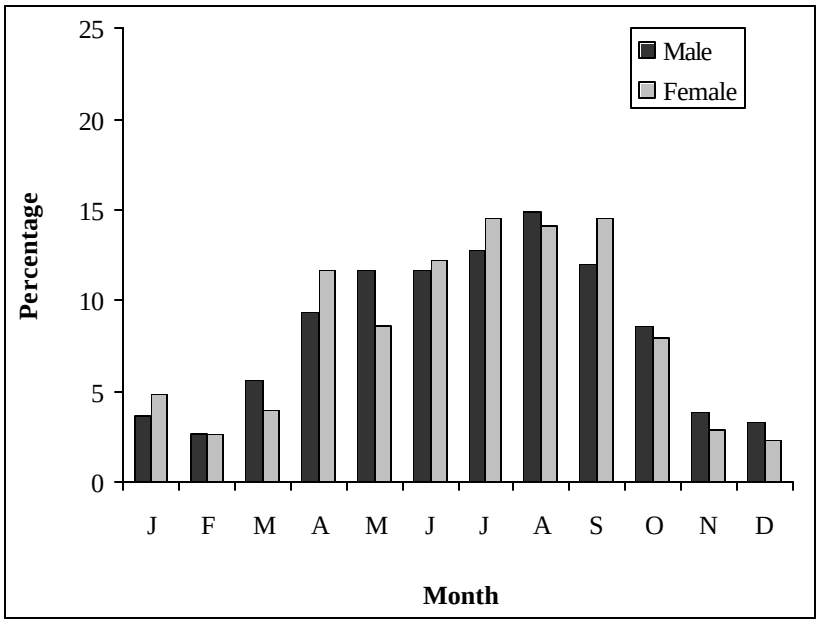
Month	Male		Female		Ratio
	No.	%	No.	%	Male:Female
January	29	3.7	15	4.8	2:1
February	21	2.7	8	2.6	3:1
March	44	5.6	12	3.9	4:1
April	73	9.3	36	11.6	2:1
May	91	11.6	27	8.7	3:1
June	91	11.6	38	12.2	2:1
July	100	12.8	45	14.5	2:1
August	117	14.9	44	14.1	3:1
September	94	12.0	45	14.5	2:1
October	67	8.6	25	8.0	3:1
November	30	3.8	9	2.9	3:1
December	26	3.3	7	2.3	4:1
Total	**783**	**100**	**311**	**100**	**3:1**

Source: Canadian Agricultural Injury Surveillance Program

MONTH AND GENDER (%)

Figure 10.1.4 shows the percentage distribution of hospitalized farm injuries by month for individuals aged 0-14 years. Both males and females had an increase in the proportion of hospitalized injuries during the summer months, peaking in the later months of July and August.

FIGURE 10.1.4 Proportions of hospitalized farm injuries among children (0-14 yrs), by month and gender (1094 cases)



AGES 0 TO 14 YEARS

MECHANISM AND GENDER

Table 10.1.5 shows the gender distribution of hospitalized farm injuries for individuals aged 0-14 years considering the mechanism of injury. For both genders, the most prominent mechanism was caught in/ entanglement, followed by being run over or falling from the machine.

TABLE 10.1.5 Hospitalized farm machinery injuries among children (0-14 yrs), by mechanism and gender (513 cases)

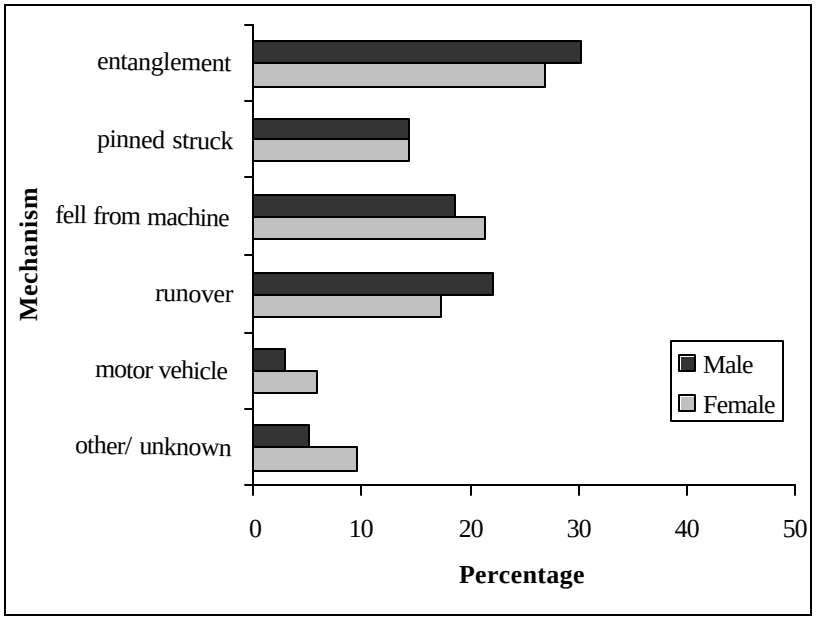
Mechanism	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Caught in/ entanglement	123	30.1	28	26.9	4:4
Pinned or struck by machine	59	14.4	15	14.4	4:1
Fell from machine, not run over	76	18.6	22	21.2	4:1
Run over	90	22.0	18	17.3	5:1
Struck by falling or projected object	13	3.2	**	-	-
Rollover	15	3.7	**	-	-
Motor Vehicle	12	2.9	6	5.8	2:1
Other/unknown	21	5.1	10	9.6	2:1
Total	**409**	**100**	**104**	**100**	**4:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

MECHANISM AND GENDER (%)

Figure 10.1.6 shows the percentage of hospitalized farm injuries for individuals aged 0-14 years by mechanism of injury and gender. Entanglement was the most common mechanism of injury especially for males, whereas females were often injured from falling off a machine.

FIGURE 10.1.6 Proportions of hospitalized farm machinery injuries among children (0-14 yrs), by mechanism and gender (513 cases)



AGES 0 TO 14 YEARS

MACHINE TYPE AND GENDER

Table 10.1.7 shows the gender distribution of hospitalized farm machinery injuries for individuals aged 0-14 years by machine type. Tractors were the dominant cause of injury for both males and females and there was much less discrepancy between sexes when recreational vehicles were involved.

TABLE 10.1.7 Hospitalized farm machinery injuries among children (0-14 yrs), by most common machine type and gender (513 cases)*

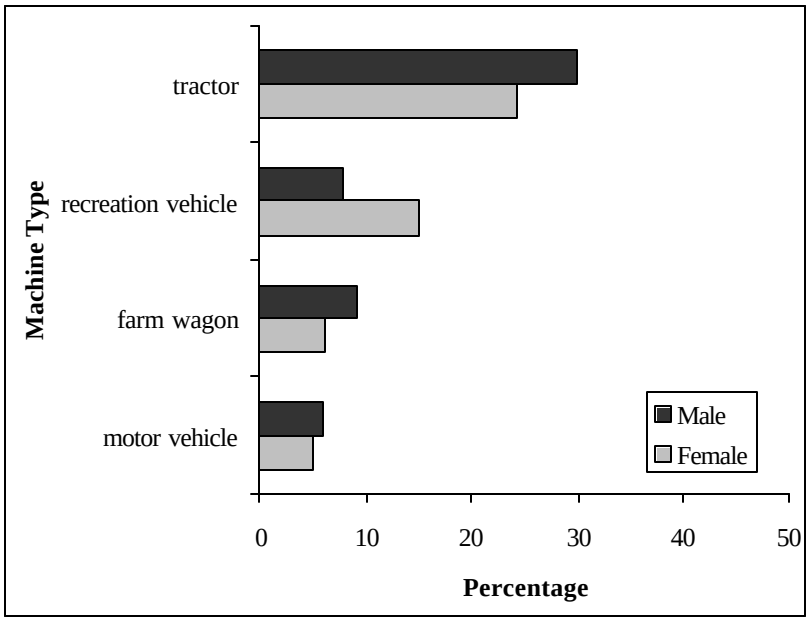
Machine Type	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Tractor	114	29.8	24	24.2	5:1
Combine	16	4.2	**	-	-
Auger	24	6.3	**	-	-
Power take off	17	4.5	**	-	-
Motor Vehicle	23	6.0	5	5.1	5:1
Baler	7	1.8	**	-	-
Plough disk	8	2.1	**	-	-
Harvester	10	2.6	**	-	-
Farm wagon	35	9.2	6	6.1	5:1
Combine	16	4.2	**	-	-
Recreational Vehicle	30	7.9	15	15.2	2:1
Other	98	24.3	34	32.3	3:1
Total	**382**	**100**	**99**	**100**	**4:1**

* 32 cases missing machine type information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

MACHINE TYPE AND GENDER (%)

Figure 10.1.8 shows the percentage of hospitalized farm injuries for individuals aged 0-14 years by machine type. Nearly one third of machine-related injuries for these individuals involved a tractor for both genders. However, recreational vehicles were also a concern accounting for 15% of female machine-related injuries.

FIGURE 10.1.8 Proportions of hospitalized farm machinery injuries among children (0-14 yrs), by 4 most common machine types and gender (513 cases)



AGES 0 TO 14 YEARS

CAUSE AND GENDER

Table 10.1.9 shows the distribution of hospitalized farm injuries for individuals aged 0-14 years by cause. For males, the most frequent cause of injury was a fall, however females were often injured as the result of an encounter with an animal.

TABLE 10.1.9 Hospitalized farm non-machinery injuries among children (0-14 yrs), by cause and gender (581cases)

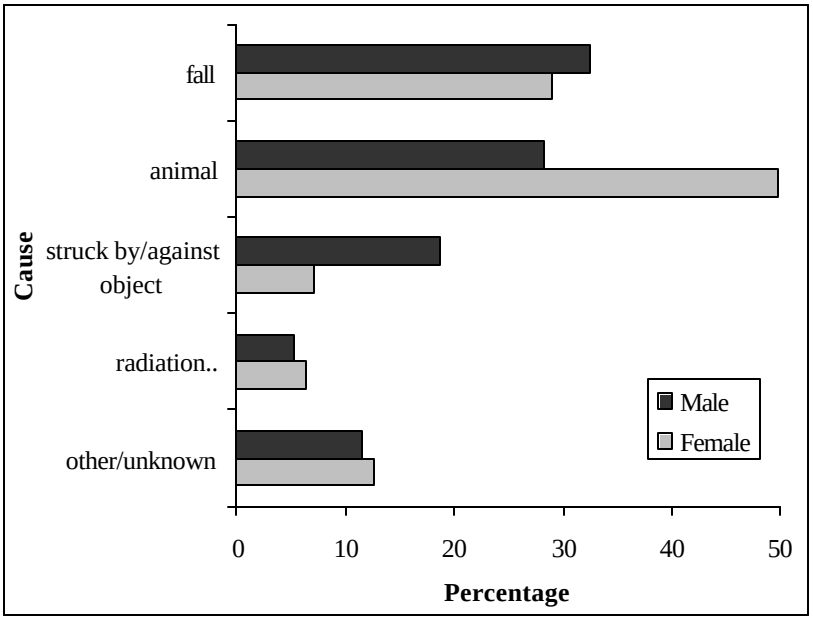
Cause	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fall	121	32.4	60	29.0	2:1
Animal	106	28.3	103	49.8	1:1
Struck by/ against object	70	18.7	15	7.2	5:1
Overexertion	0	0.0	**	-	-
Radiation, toxic/noxious substances	20	5.3	13	6.3	2:1
Fire	22	5.9	**	-	-
Caught in/ under/ between objects	5	1.3	**	-	-
Temperature extremes	7	1.9	**	-	-
Electric current	0	0.0	0	0.0	-
Other/unknown	23	6.1	7	3.4	3:1
Total	**374**	**100**	**207**	**100**	**2:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

CAUSE AND GENDER (%)

Figure 10.1.10 shows the percentage of hospitalized farm injuries for individuals aged 0-14 years by cause of injury and gender. Animals were involved in approximately half of hospitalized injuries in young girls. A large proportion of hospitalizations for young boys were as the result of a fall.

FIGURE 10.1.10 Proportions of hospitalized farm non-machinery injuries among children (0-14 yrs), by cause and gender (581 cases)



AGES 0 TO 14 YEARS

DIAGNOSIS AND GENDER

Table 10.1.11 shows the gender distribution of hospitalized farm injuries for individuals aged 0-14 years by main diagnosis. For both genders, fractures occurred most frequently, followed by lacerations and contusions.

TABLE 10.1.11 Hospitalized farm injuries among children (0-14 yrs), by primary diagnosis* and gender (1094 cases)

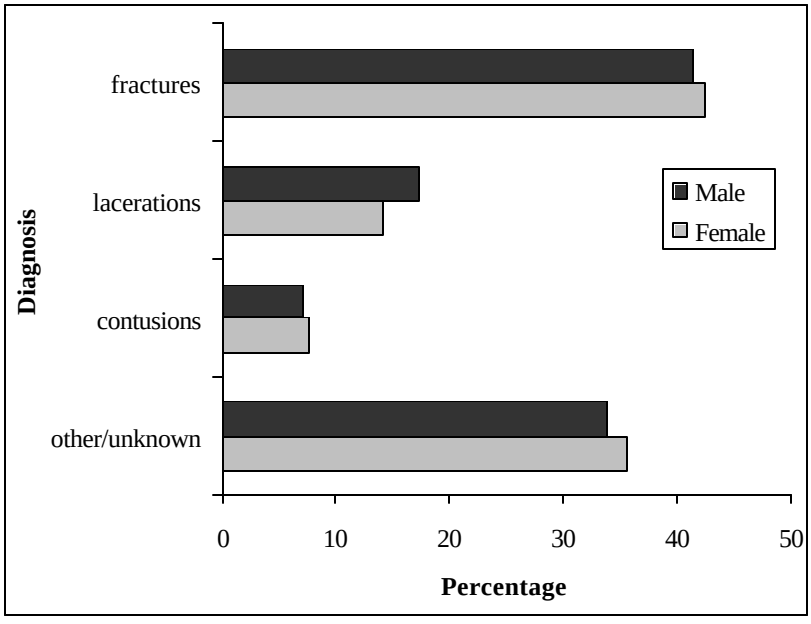
Diagnosis	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fracture	322	41.5	131	42.4	3:1
Dislocation	**	-	6	1.9	-
Sprain/Strain	**	-	**	1.0	-
Laceration	134	17.3	44	14.2	3:1
Contusion	55	7.1	24	7.6	2:1
Nerve Damage	5	0.6	**	-	-
Joint Disorders	5	0.6	0	0.0	-
Other	248	32.0	100	32.4	3:1
Total	**654**	**100**	**309**	**100**	**2:1**

*diagnosis categories are not mutually exclusive
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

DIAGNOSIS AND GENDER (%)

Figure 10.1.12 shows the percentage of hospitalized farm injuries for individuals aged 0-14 years by main diagnosis and gender. Fractures were most common diagnosis for both males and females. For fractures, lacerations and contusions the proportion of males and females injured were approximate equal in each case.

FIGURE 10.1.12 Proportions of hospitalized farm injuries among children (0-14 yrs), by primary diagnosis and gender (1094 cases)



AGES 0 TO 14 YEARS

ANATOMICAL SITE AND GENDER

Table 10.1.13 shows the gender distribution of hospitalized farm injuries for individuals aged 0-14 years by the anatomical site of the injury. For both genders, the more than half of injuries occurred to an extremity. Children injured their head nearly one quarter all hospitalizations.

TABLE 10.1.13 Hospitalized farm injuries among children (0-14 yrs), by anatomical site and gender (1094 cases)*

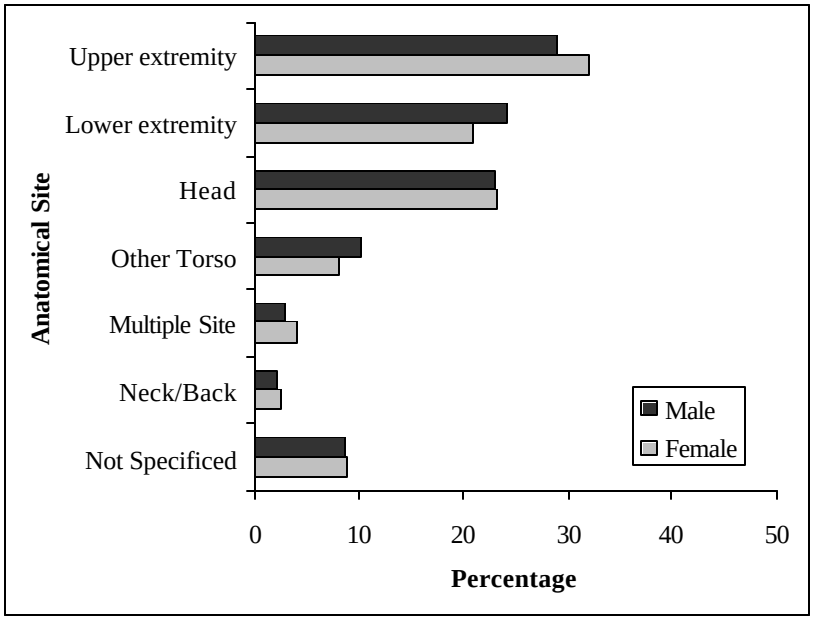
Anatomical Site	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Upper extremity	225	29.0	99	32.0	2:1
Lower extremity	187	24.1	65	21.0	3:1
Head	178	23.0	72	23.3	3:1
Other torso	80	10.3	25	8.1	3:1
Lower back	**	-	**	-	-
Multiple site	22	2.8	13	4.2	2:1
Upper back	12	1.5	**	-	-
Neck	**	-	**	-	-
Not specified	66	8.5	27	8.7	2:1
Total	**775**	**100**	**309**	**100**	**3:1**

* 10 cases missing anatomical site information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

ANATOMICAL SITE AND GENDER (%)

Figure 10.1.14 shows the percentage of hospitalized farm injuries for individuals aged 0-14 years considering the anatomical site of the injury and gender. Injuries to the extremities composed the majority of the injuries for both males and females. Girls had a slightly greater percentage of upper extremity injuries. Whereas boys had a slightly greater percentage of injuries to the lower extremities. For both genders, head injuries were relatively frequent.

FIGURE 10.1.14 Proportions of hospitalized farm machinery injuries among children (0-14 yrs), by anatomical site and gender (1094 cases)*



HOSPITALIZED FARM INJURIES: BY AGE GROUP

10.2 AGES 15 TO 59 YEARS

AGE AND GENDER

Table 10.2.1 shows the gender distribution of hospitalized farm injuries by age for individuals aged 15-59 years. For both genders, the incidence of hospitalizations remained relatively stable after the age of 30. The male-to-female ratio value of 5.0:1 demonstrates a doubling from that of children under the age of 15. This shows a greater increase in male hospitalizations with age when compared to their female counterparts.

TABLE 10.2.1 Hospitalized farm injuries among adult (15-59 yrs), by age and gender (5338 cases)

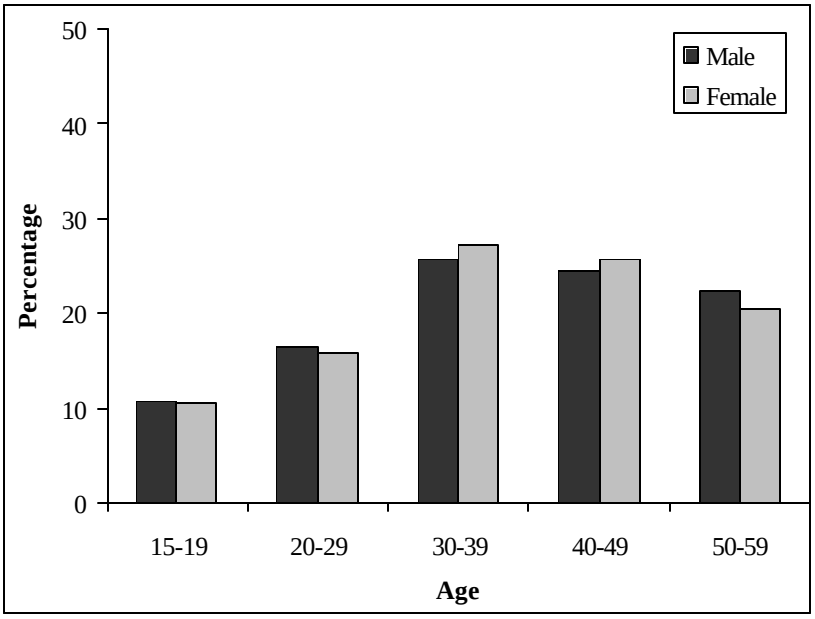
	Male		Female		Ratio
Age	**No.**	**%**	**No.**	**%**	**Male:Female**
15-19	474	10.7	94	10.5	5:1
20-29	736	16.6	143	15.9	5:1
30-39	1142	25.7	245	27.3	5:1
40-49	1093	24.6	230	25.6	5:1
50-59	996	22.4	185	20.6	5:1
Total	**4441**	**100**	**897**	**100**	**5:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 10.2.2 shows the distribution of hospitalized farm machinery injuries by age and gender for individuals aged 15-59 years. The proportions were nearly equal for both males and females at any given age and for both genders, hospitalization peaked between the ages of 30 and 39.

FIGURE 10.2.2 Proportions of hospitalized farm injuries among adults (15-59 yrs), by age and gender (5338 cases)



AGES 15 TO 59 YEARS

MONTH AND GENDER

Table 10.2.3 shows the gender distribution of hospitalized farm injuries by month for individuals aged 15-59 years. For both genders, there was an increase in the number of injuries between the months of May and October.

TABLE 10.2.3 Hospitalized farm injuries among adults (15-59 yrs), by month and gender (5338 cases)*

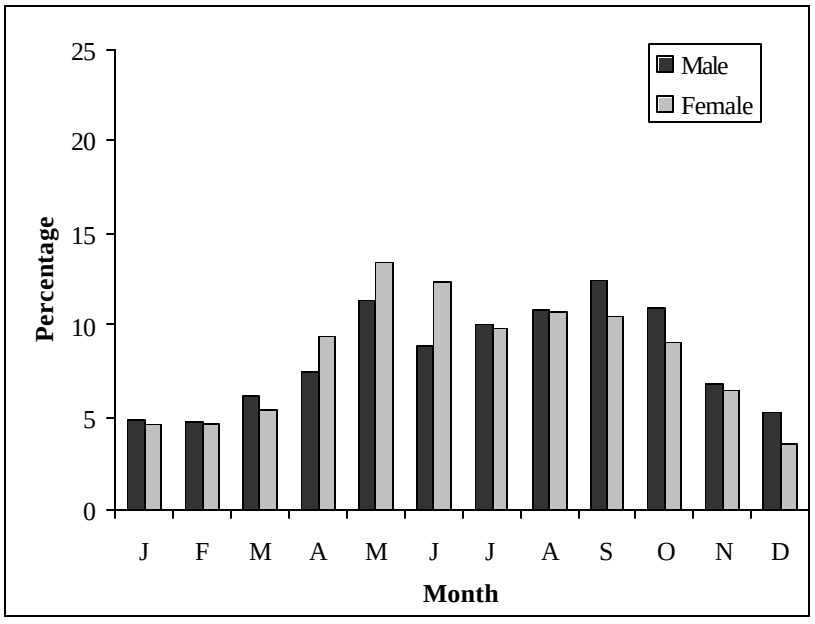
Month	Male		Female		Ratio
	No.	%	No.	%	Male:Female
January	218	4.9	41	4.6	5:1
February	211	4.8	42	4.7	5:1
March	274	6.2	48	5.4	6:1
April	332	7.5	84	9.4	4:1
May	504	11.4	120	13.4	4:1
June	369	8.3	111	12.4	4:1
July	444	10.0	88	9.8	5:1
August	486	10.9	97	10.8	5:1
September	553	12.5	94	10.5	6:1
October	490	11.0	82	9.1	6:1
November	303	6.8	58	6.5	5:1
December	229	5.2	32	3.6	7:1
Total	**4413**	**100**	**897**	**100**	**5:1**

* 28 cases missing month information
Source: Canadian Agricultural Injury Surveillance Program

MONTH AND GENDER (%)

Figure 10.2.4 shows the percentage distribution of hospitalized farm injuries by month for individuals aged 15-59 years. Both males and females had an increase in hospitalized injuries during the Summer months. A higher proportion of females were injured in the Spring months of April to June while male injuries increased slightly during the Summer and Fall months.

FIGURE 10.2.4 Proportions of hospitalized farm injuries among adults (15-59 yrs), by month and gender (5338 cases)*



AGES 15 TO 59 YEARS

MECHANISM AND GENDER

Table 10.2.5 shows the gender distribution of hospitalized farm injuries for individuals aged 15-59 years by the mechanism of injury. For both genders, the most prominent mechanism was caught in/ entanglement, followed by being pinned or struck by machine or falling from the machine.

TABLE 10.2.5 Hospitalized farm machinery injuries among adults (15-59 yrs), by mechanism and gender (2558 cases)

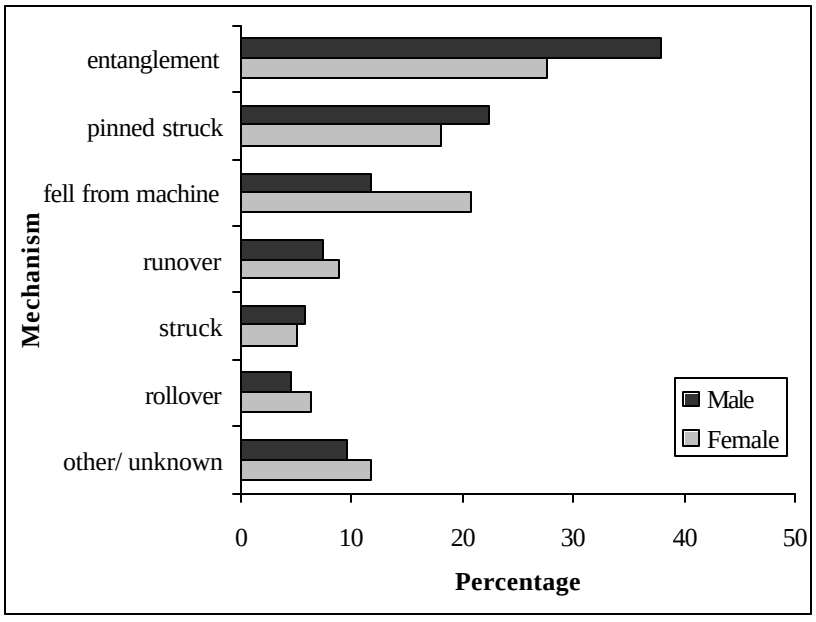
Mechanism	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Caught in/ entanglement	874	37.9	69	27.6	13:1
Pinned or struck by machine	517	22.4	45	18.0	12:1
Fell from machine, not run over	269	11.7	52	20.8	5:1
Run over	171	7.4	22	8.8	8:1
Struck by falling or projected object	135	5.8	13	5.2	10:1
Rollover	103	4.5	16	6.4	6:1
Motor Vehicle	17	0.7	**	-	-
Other/unknown	222	9.6	29	11.6	8:1
Total	**2308**	**100**	**250**	**100**	**9:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

MECHANISM AND GENDER (%)

Figure 10.2.6 shows the percentage of hospitalized farm injuries for individuals aged 15-59 years by mechanism of injury and gender. Entanglement was the most common mechanism of injury especially for males, whereas a greater proportion of females were often injured from falling off a machine.

FIGURE 10.2.6 Proportions of hospitalized farm machinery injuries among adults (15-59 yrs), by mechanism and gender (2558 cases)



AGES 15 TO 59 YEARS

MACHINE TYPE AND GENDER

Table 10.2.7 shows the gender distribution of the most common hospitalized farm machinery injuries for individuals aged 15-59 years by machine type. Tractors were the dominant cause of injury for both males and females. The male-to-female ratio reached an extreme value of 29:1 when comparing injuries due to power tools.

TABLE 10.2.7 **Hospitalized farm machinery injuries among adults (15-59 yrs), by most common machine type and gender (2558 cases)***

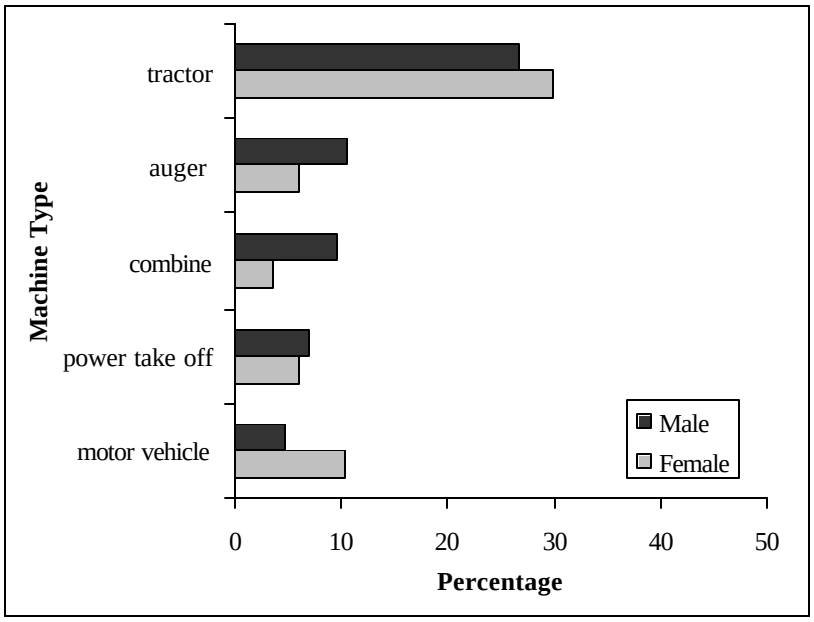
Machine Type	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Tractor	584	26.6	72	29.9	8:1
Combine	210	9.6	9	3.7	23:1
Auger	233	10.6	15	6.2	16:1
Power take off	155	7.1	15	6.2	10:1
Motor Vehicle	105	4.8	25	10.4	4:1
Baler	108	4.9	4	1.7	27:1
Plough Disk	70	3.2	10	4.1	7:1
Harvester	82	3.7	12	5.0	7:1
Farm wagon	51	2.3	17	7.1	3:1
Recreational Vehicle	43	2.0	12	5.0	4:1
Other	553	25.2	50	20.7	11:1
Total	**2194**	**100**	**241**	**100**	**9:1**

* 123 cases missing machine type information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

MACHINE TYPE AND GENDER (%)

Figure 10.2.8 shows the percentage of hospitalized farm injuries for individuals aged 15-59 years by machine type. Over a quarter of machine-related injuries for these individuals involved a tractor, followed by augers accounting for an additional 6-10%.

FIGURE 10.2.8 **Proportions of hospitalized farm machinery injuries among adults (15-59 yrs), by 5 most common machine types and gender (2558 cases)**



AGES 15 TO 59 YEARS

CAUSE AND GENDER

Table 10.2.9 shows the distribution of hospitalized farm injuries for individuals aged 15-59 years by cause. For both genders, animals were the most frequent cause of injury. Other concerns were suffering a fall or being struck by/against an object.

TABLE 10.2.9 Hospitalized non-machinery farm injuries among adults (15-59 yrs), by cause and gender (2780 cases)

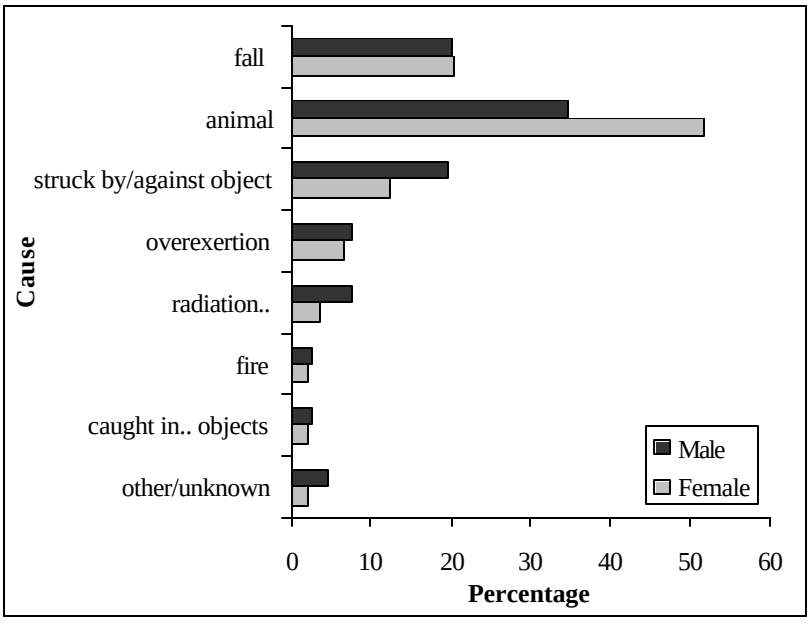
Cause	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fall	427	20.0	131	20.3	3:1
Animal	741	34.7	335	51.8	2:1
Struck by/ against object	421	19.7	79	12.2	5:1
Overexertion	163	7.6	42	6.5	4:1
Radiation, toxic/ noxious substances	161	7.5	22	3.4	7:1
Fire	66	3.1	10	1.5	7:1
Caught in/ under/ between objects	56	2.6	13	2.0	4:1
Temperature extremes	10	0.5	**	-	-
Electric current	17	0.8	**	-	-
Other/unknown	71	3.3	8	1.2	9:1
Total	**2133**	**100**	**647**	**100**	**3:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

CAUSE AND GENDER (%)

Figure 10.2.10 shows the percentage of hospitalized farm injuries for individuals aged 15-59 years by cause of injury and gender. More than half of non-machinery female injuries involved an animal. A slightly greater proportion of males were injured by being struck by/against an object.

FIGURE 10.2.10 Proportions of hospitalized non-machinery farm injuries among adults (15-59 yrs), by cause and gender (2780 cases)



AGES 15 TO 59 YEARS

DIAGNOSIS AND GENDER

Table 10.2.11 shows the gender distribution of hospitalized farm injuries for individuals aged 15-59 years by main diagnosis. For both genders, fractures occurred frequently followed by lacerations and contusions. (diagnosis categories are not mutually exclusive)

TABLE 10.2.11 Hospitalized farm injuries among adults (15-59 yrs), by primary diagnosis and gender (5338 cases)*

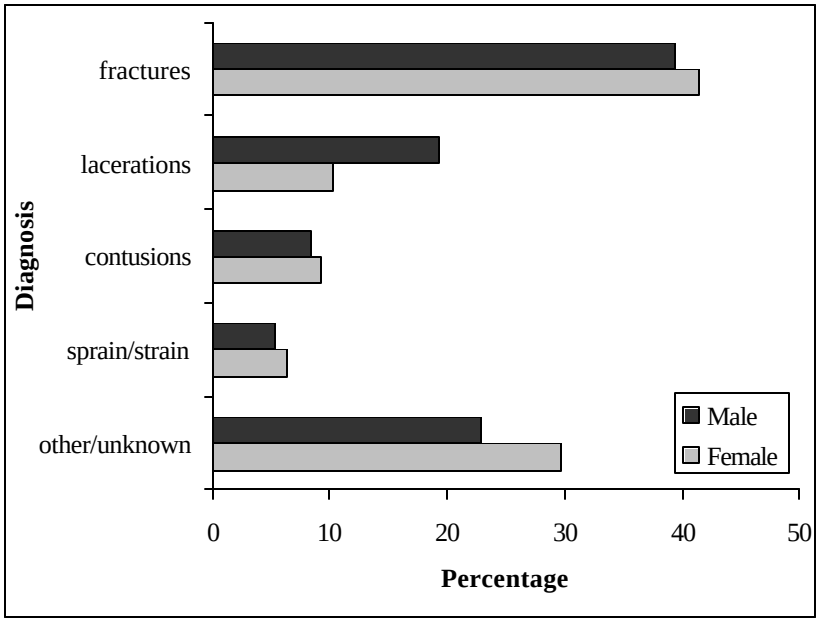
Diagnosis	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fracture	1695	38.4	369	42.3	10:1
Dislocation	147	3.3	24	2.7	6:1
Sprain/Strain	234	5.3	56	6.4	4:1
Laceration	855	19.4	92	10.5	9:1
Contusion	368	8.3	63	7.2	6:1
Nerve Damage	42	1.0	6	0.7	7:1
Joint Disorders	58	1.3	8	0.9	7:1
Other	1012	22.9	255	29.2	4:1
Total	**4411**	**100**	**873**	**100**	**5:1**

*54 cases missing diagnosis information
Source: Canadian Agricultural Injury Surveillance Program

DIAGNOSIS AND GENDER (%)

Figure 10.2.12 shows the percentage of hospitalized farm injuries for individuals aged 15-59 years by main diagnosis and gender. Fractures were most common diagnosis for both males and females. Males had a slightly higher proportion of lacerations than their female counterparts.

FIGURE 10.2.12 Proportions of hospitalized farm injuries among adults (15-59 yrs), by primary diagnosis and gender (5338 cases)*



AGES 15 TO 59 YEARS

ANATOMICAL SITE AND GENDER

Table 10.2.13 shows the gender distribution of hospitalized farm injuries for individuals aged 15-59 years by the anatomical site of the injury. Nearly 60% of injuries to this age group affected an extremity. A lesser but relevant proportion of injuries involved the head. (anatomical site categories are not mutually exclusive)

TABLE 10.2.13 Hospitalized farm machinery injuries among adults (15-59 yrs), by anatomical site and gender (5338 cases)*

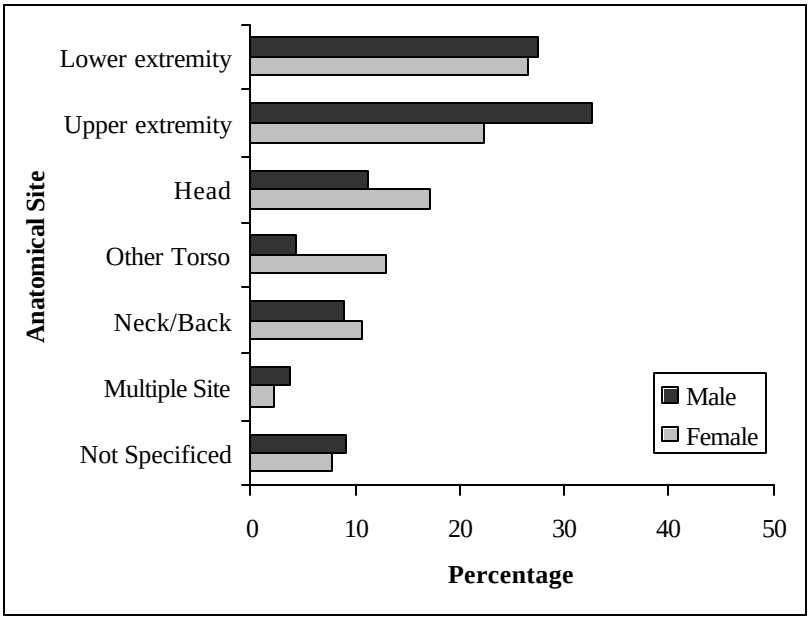
Anatomical Site	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Lower extremity	1145	27.5	237	26.5	5:1
Upper extremity	1363	32.7	199	22.3	7:1
Head	468	11.2	154	17.2	3:1
Other torso	290	4.3	117	13.1	3:1
Lower back	181	4.3	62	6.9	3:1
Multiple site	158	3.8	19	2.1	8:1
Upper back	145	3.5	27	3.0	5:1
Neck	46	1.1	8	0.9	6:1
Not specified	375	9.0	70	7.8	5:1
Total	**4171**	**100**	**893**	**100**	**5:1**

* 274 cases missing anatomical site information
Source: Canadian Agricultural Injury Surveillance Program

ANATOMICAL SITE AND GENDER (%)

Figure 10.2.14 shows the percentage of hospitalized farm injuries for individuals aged 15-59 years considering the anatomical site of the injury and gender. Males had a slightly greater percentage of upper extremity injuries, females had a slightly greater percentage of injuries to the head and torso.

FIGURE 10.2.14 Proportions of hospitalized farm machinery injuries among adults (15-59 yrs), by anatomical site and gender (5338 cases)*



10.3 AGES 60+ YEARS

AGE AND GENDER

Table 10.3.1 shows the gender distribution of hospitalized farm injuries by age for individuals aged 60+ years. The male-to-:female ratio value of 7.0:1 demonstrates an increase from that of individuals aged 15-59.

TABLE 10.3.1 **Hospitalized farm injuries among older adults (60+ yrs), by age and gender (1831 cases)**

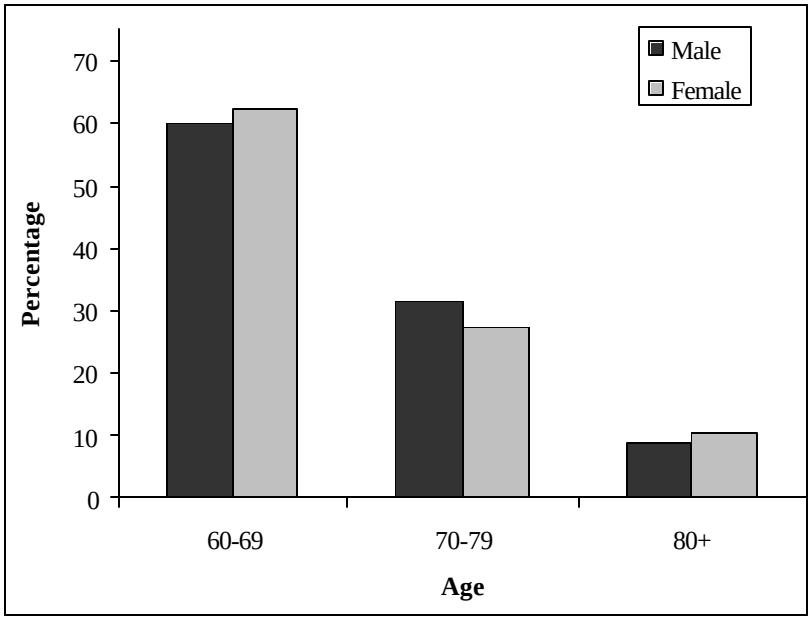
	Male		Female		Ratio
Age	**No.**	**%**	**No.**	**%**	**Male:Female**
60-69	960	59.9	142	62.3	7:1
70-79	502	31.3	62	27.2	8:1
80+	141	8.8	24	10.5	6:1
Total	**1603**	**100**	**228**	**100**	**7:1**

Source: Canadian Agricultural Injury Surveillance Program

AGE AND GENDER (%)

Figure 10.3.2 shows the distribution of hospitalized farm machinery injuries by age and gender for individuals aged 60+ years. The proportions were nearly equal for both males and females at any given age and for both genders, hospitalization greatly decreased with age.

FIGURE 10.3.2 **Proportions of hospitalized farm injuries among older adults (60+ yrs), by age and gender (1831 cases)**



AGES 60+ YEARS

MONTH AND GENDER

Table 10.3.3 shows the gender distribution of hospitalized farm injuries by month for individuals aged 60+ years. For both genders, there was an increase in the number of injuries between the months of April and October (though decreasing slightly in the month of June).

TABLE 10.3.3 Hospitalized farm injuries among older adults (60+ yrs), by month and gender (1831 cases)

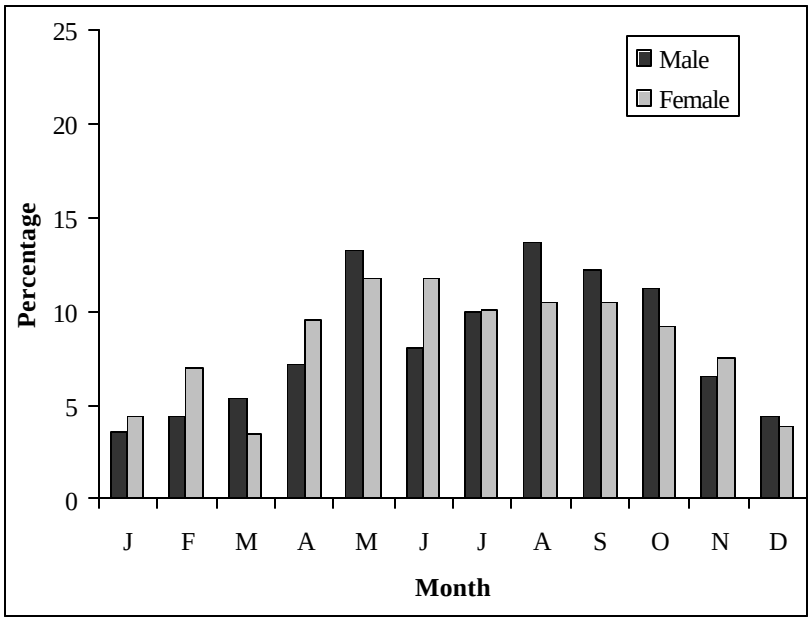
Month	Male		Female		Ratio
	No.	%	No.	%	Male:Female
January	58	3.6	10	4.4	6:1
February	70	4.4	16	7.0	4:1
March	85	5.3	8	3.5	11:1
April	116	7.2	22	9.6	5:1
May	212	13.2	27	11.8	8:1
June	130	8.1	27	11.8	5:1
July	161	10.0	23	10.1	7:1
August	220	13.7	24	10.5	9:1
September	196	12.2	24	10.5	8:1
October	180	11.2	21	9.2	9:1
November	104	6.5	17	7.5	6:1
December	71	4.4	9	3.9	8:1
Total	**1603**	**100**	**228**	**100**	**7:1**

Source: Canadian Agricultural Injury Surveillance Program

MONTH AND GENDER (%)

Figure 10.3.4 shows the percentage distribution of hospitalized farm injuries by month for individuals aged 60+ years. Both males and females had an increase in hospitalized injuries during the summer months. A higher proportion of females were injured in the Spring months of April and June while male injuries increased slightly during the late Summer and Fall months.

FIGURE 10.3.4 Proportions of hospitalized farm injuries among older adults (60+yrs), by month and gender (1831 cases)



AGES 60+ YEARS

MECHANISM AND GENDER

Table 10.3.5 shows the gender distribution of hospitalized farm injuries for individuals aged 60+ years considering the mechanism of injury. For both genders, the most prominent mechanism was caught in/ entanglement, followed by falling from the machine. Note that older males are injured by machinery over twenty times more frequently than older females.

TABLE 10.3.5 Hospitalized farm machinery injuries among older adults (60+ yrs), by mechanism and gender (971 cases)

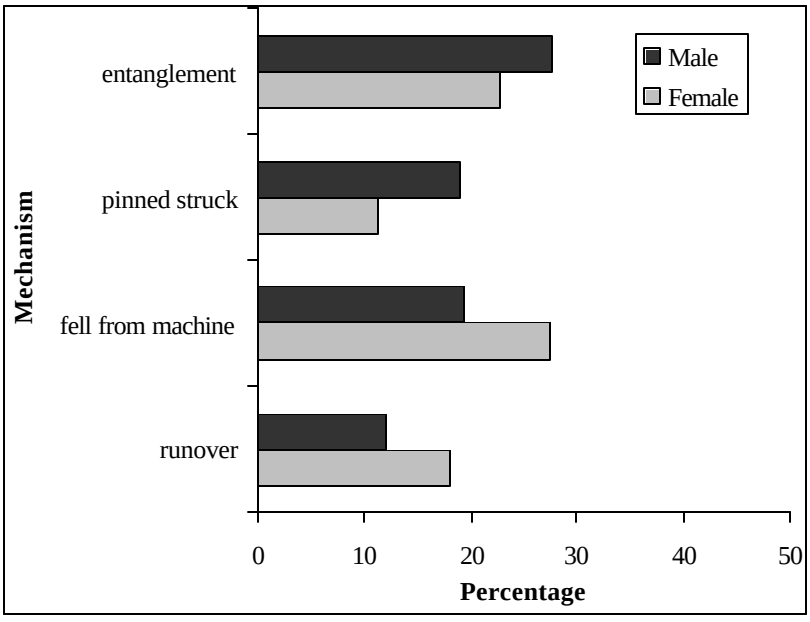
Mechanism	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Caught in/ entanglement	256	27.6	10	22.7	26:1
Pinned or struck by machine	175	18.9	5	11.4	35:1
Fell from machine, not run over	180	19.4	12	27.3	15:1
Run over	111	12.0	8	18.2	14:1
Struck by falling or projected object	50	5.4	**	-	-
Rollover	60	6.5	**	-	-
Motor Vehicle	**	-	0	0.0	-
Other/unknown	91	9.8	**	-	-
Total	**927**	**100**	**44**	**100**	**21:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

MECHANISM AND GENDER (%)

Figure 10.3.6 shows the percentage of hospitalized farm injuries for individuals aged 60+ years by mechanism of injury and gender. For males, entanglement was the most common mechanism of injury, followed by being pinned or struck by machine. However, the largest proportion of female injuries resulted from falling off a machine.

FIGURE 10.3.6 Proportions of hospitalized farm machinery injuries among older adults (60+ yrs), by mechanism and gender (971 cases)



AGES 60+ YEARS

MACHINE TYPE AND GENDER

Table 10.3.7 shows the gender distribution of hospitalized farm machinery injuries for individuals aged 60+ years by machine type. Tractors were the dominant cause of injury for both males and females.

TABLE 10.3.7 Hospitalized farm machinery injuries among older adults (60+ yrs), by most common machine type and gender (971 cases)*

Machine Type	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Tractor	317	36.0	16	37.2	20:01
Combine	109	12.4	**	-	-
Auger	81	9.2	6	14.0	14:01
Power take off	29	3.3	0	0.0	-
Motor Vehicle	57	6.5	**	-	-
Baler	36	4.1	**	-	-
Plough Disk	35	4.0	**	-	-
Harvester	12	1.4	**	-	-
Farm wagon	17	1.9	0	0.0	-
Recreational Vehicle	8	0.9	**	-	-
Other	179	20.3	11	25.6	16:1
Total	**880**	**100**	**43**	**100**	**20:1**

* 48 cases missing machine type information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

AGES 60+ YEARS

CAUSE AND GENDER

Table 10.3.8 shows the distribution of hospitalized farm injuries for individuals aged 60+ years by cause. Older males were the most frequently injured by animals. For older females, nearly half of hospitalized injuries involved a fall.

TABLE 10.3.8 Hospitalized non-machinery farm injuries among older adults (60+ yrs), by cause and gender (858 cases)

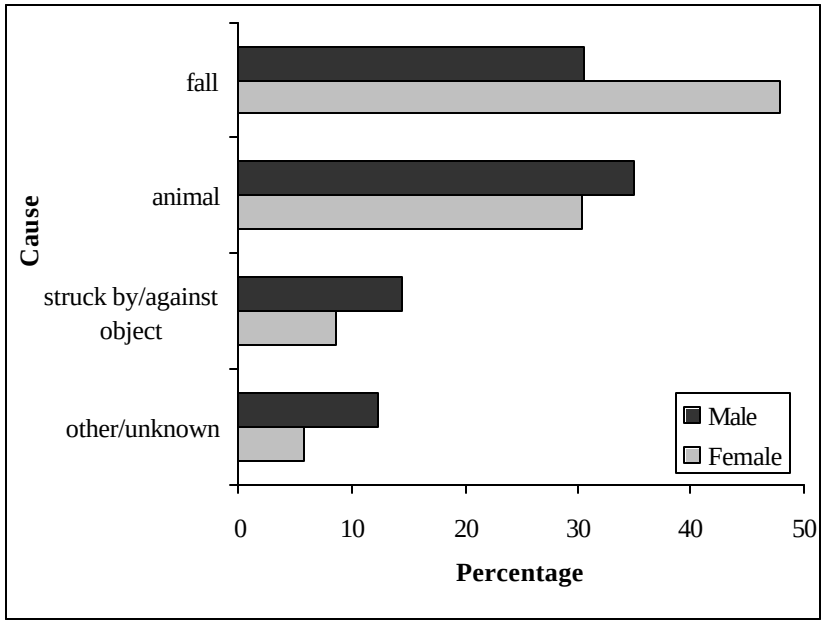
Cause	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fall	207	30.6	88	48.4	2:1
Animal	237	35.1	58	31.9	4:1
Struck by/ against object	98	14.5	16	8.8	6:1
Overexertion	50	7.4	9	4.9	6:1
Radiation, toxic/ noxious substances	23	3.7	**	-	-
Fire	25	3.7	**	-	-
Caught in/ under/ between objects	13	1.9	**	-	-
Temperature extremes	6	0.9	**	-	-
Electric current	**	-	0	0.0	-
Other/unknown	15	2.2	**	-	-
Total	**676**	**100**	**182**	**100**	**4:1**

** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

CAUSE AND GENDER (%)

Figure 10.3.9 shows the percentage of hospitalized farm injuries for individuals aged 60+ years by cause of injury and gender. A higher proportion of older females were injures by a fall compared to their male counterparts. However, a slightly higher proportion of older males were injured by animals or being struck by/against an object when compared to females.

FIGURE 10.3.9 Proportions of hospitalized farm machinery injuries among older adults (60+ yrs), by cause and gender (858 cases)



AGES 60+YEARS

DIAGNOSIS AND GENDER

Table 10.3.10 shows the gender distribution of hospitalized farm injuries for individuals aged 60+ years by main diagnosis. For both genders, fractures occurred frequently as bones weaken with age. Older men had fifteen times more lacerations than their female counterparts. (diagnosis categories are not mutually exclusive)

TABLE 10.3.10 Hospitalized farm machinery injuries among older adults (60+ yrs), by primary diagnosis and gender (1831 cases)*

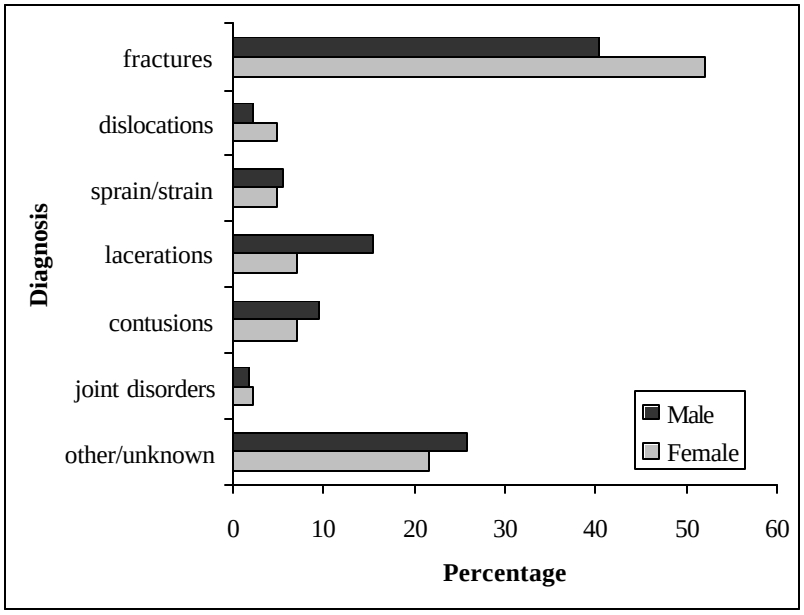
Diagnosis	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Fracture	642	40.3	118	52.2	5:1
Dislocation	37	2.3	11	4.9	3:1
Sprain/Strain	87	5.5	11	4.9	8:1
Laceration	245	15.4	16	7.1	15:1
Contusion	148	9.3	16	7.1	9:1
Nerve Damage	18	1.1	**	-	-
Joint Disorders	26	1.6	5	2.2	5:1
Other	391	24.5	48	21.2	8:1
Total	**1594**	**100**	**226**	**100**	**7:1**

* 11 cases missing diagnosis information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

DIAGNOSIS AND GENDER (%)

Figure 10.3.11 shows the percentage of hospitalized farm injuries for individuals aged 60+ years by main diagnosis and gender. Fractures occurred more than half of injuries to older females. Older males had a slightly higher proportion of lacerations than their female counterparts.

FIGURE 10.3.11 Proportions of hospitalized farm machinery injuries among older adults (60+ yrs), by primary diagnosis and gender (1831 cases)*



AGES 60+YEARS

ANATOMICAL SITE AND GENDER

Table 10.3.12 shows the gender distribution of hospitalized farm injuries for individuals aged 60+ years by the anatomical site of the injury. More than half of injuries to this age group affected an extremity. A lesser but relevant proportion of injuries involved the torso. Older males had more neck injuries than older females. (anatomical site categories are not mutually exclusive)

TABLE 10.3.12 Hospitalized farm machinery injuries among older adults (60+ yrs), by anatomical site and gender (1831 cases)*

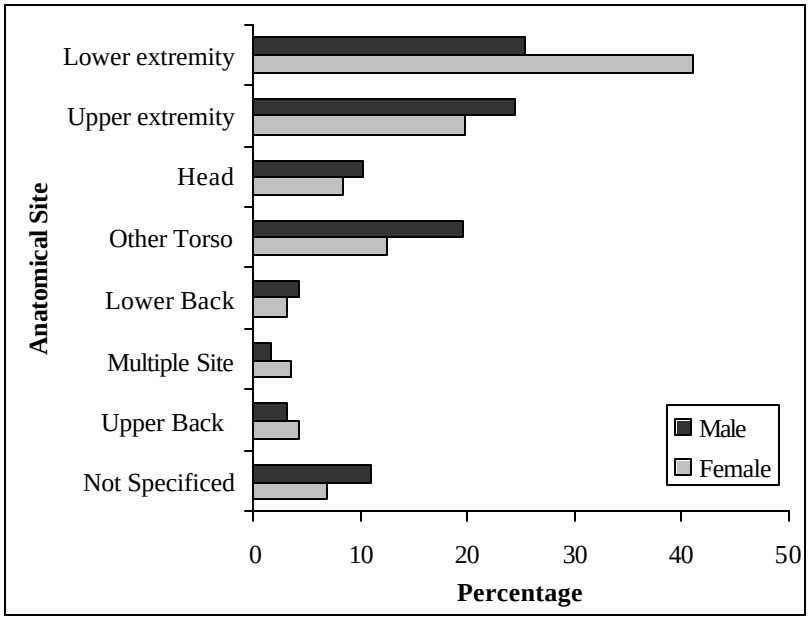
Anatomical Site	Male		Female		Ratio
	No.	%	No.	%	Male:Female
Lower extremity	404	25.3	93	41.2	4:1
Upper extremity	393	24.5	45	19.9	9:1
Head	165	10.4	19	8.4	9:1
Other torso	312	19.6	28	12.4	11:1
Lower back	69	4.3	7	3.1	10:1
Multiple site	26	1.6	8	3.5	3:1
Upper back	51	3.2	10	4.4	5:1
Neck	24	1.5	**	-	-
Not specified	150	9.4	15	6.6	10:1
Total	**1594**	**100**	**226**	**100**	**7:1**

* 11 cases missing anatomical site information
** indicates a count less than 5
Source: Canadian Agricultural Injury Surveillance Program

ANATOMICAL SITE AND GENDER (%)

Figure 10.3.13 shows the percentage of hospitalized farm injuries for individuals aged 60+ years considering the anatomical site of the injury and gender. Older females had a far greater percentage of lower extremity injuries. Whereas older males had a slightly greater percentage of injuries to the torso compared to their female counterparts.

FIGURE 10.3.13 Proportions of hospitalized farm machinery injuries among older adults (60+ yrs), by anatomical site and gender (1831 cases)*



11.0 HIGHLIGHTS AND RECOMMENDATIONS

11.1 INJURY PATTERNS AND PREVENTION HIGHLIGHTS

11.1.1 Work-Related Fatal Farm Injuries

1) The average annual number of fatal farm injuries identified was 101, with a yearly average of 76 male fatalities and 7 female fatalities. There were 11 times as many work-related fatal farm injuries for men as there were for women.

2) For males, 38% of fatal farm injuries were among those sixty years of age and older, in comparison to 12% for females. Children under age 10 accounted for 25% of female deaths compared to 7% of males.

3) For both genders, 71% of fatal farm injuries involved machinery.

4) Nearly half of the work-related fatal farm injuries to females and 40% of injuries to males occurred between July and September.

5) For both genders, 25% of injuries occurred while working in the field. More than half of those who were fatally injured died at the scene.

11.1.2 Fatal Farm Machinery Injuries

1) Of the 708 fatal farm injuries, 500 cases involved machinery, with an average male:female ratio also of 11:1.

2) For both genders, tractors were involved in just over 65% of fatal farm injuries.

3) The highest percentage of machinery-related injuries for males involved a machine rollover (32%) or runover (20%). For females the order was reversed, at 23% and 44% respectively.

11.1.3 Fatal Non-Machinery Injuries

1) Of the 708 fatal farm injuries, 208 cases had non-machinery causes, the average male:female ratio was also 11:1.

2) The highest percentage of non-machinery fatalites for males involved being struck by an object (24%) followed by animals and falls (14% each). For females, struck by and animal-related causes of injury accounted for 35% each of the total fatalities.

11.1.4 Hospitalized Farm Injuries

1) The total number of hospitalized farm injuries identified was 8263, leading to an average of 1653 per year (287 females and 1366 males). On average, there were 5 times as many work-related fatal farm injuries for men as there were for women. The sex ratio remained fairly constant by year.

2) For males, 24% of hospitalized farm injuries were among those sixty years of age and older, in comparison to 16% for females. Children under age 10 accounted for 12% of female hospitalization compared to 7% of males.

3) For males, 53% of hospitalized farm injuries involved machinery in comparison to 27% for females.

4) The most common diagnoses were fractures and lacerations for both males and females. Over age 60, fractures accounted for 52% of female injuries in comparison to 40% for males.

5) The upper extremity was the anatomical site with the highest male:female ratio (6:1); the lowest was the head (3:1).

11.1.5 Hospitalized Farm Machinery Injuries

1) Tractors were the most frequent type of machinery involved in hospitalizations for both genders (28%). For females, motor vehicles were the next most common machine type and for males it was a combine (9% for both).

2) For both genders, approximately half of machinery-related hospitalizations required a hospital stay of less than three days. The proportion of longer stays (over 6 days) was the same for both genders.

11.1.6 Hospitalized Non-Machinery Farm Injuries

1) For females, 48% of hospitalized farm injuries with non-machinery cause involved animals, compared to 34% for males. Of such cases, a horse was the most frequent animal involved for females (65%), whereas for males it was a cow (56%).

2) For both genders, the second most common cause of non-machinery farm injuries were falls (27% of females and 24% of males). For females age 60 and above, 48% of non-machinery hospitalized injuries were due to falls, compared to 31% of older men.

11.2 RECOMMENDATIONS FOR PREVENTION

1) The report illustrates that fatalities and hospitalizations due to farm injuries have both common and distinct patterns when comparing males and females. These patterns can be applied for the refinement of existing prevention programs and in the creation of innovative approaches to prevention that take into account gender specific risks for injuries.

Males and females have the following patterns of injury in common:

a) Machinery, and particularly tractors, are the leading causes of death;
b) Seasonality and location of deaths are consistent between genders;
c) Diagnoses and lengths of hospital stay are also consistent;
d) Animals and falls are leading causes of hospitalization in both genders.

Differences between male and female injury patterns include:

e) Injuries to males strongly outnumber that of females for all types/mechanisms of farm injury;
f) Differences in the distribution of injuries by age: proportionality more older males and young females are injured;
g) The relative importance of rollovers as the mechanism of injury for males compared to runovers for females;
h) The higher percentage of older females having falls and fractures;
i) A greater proportion of females injured by horses

2) Explanations for the different patterns of injury may be attributed to gender differences in:

a) the size of the populations at risk
b) duration of agricultural work exposures
c) the nature of farm work assignments
d) biomechanical and ergonomical considerations
e) behaviours and risk avoidance
f) other unknown factors

Further scientific investigation of the causes for gender differences in farm injury is warranted.

3) Education and training programs:

a) for females, emphasis should be on safe handling and care of large animals, especially horses;
b) the hazards of operating farm machinery should be targeted to males, particularly those over age 60;
c) females should be made more aware of the potential for runover injuries from tractors;
d) youth organizations, such as 4-H clubs, are encouraged to emphasize that both boys and girls are at risk for farm injuries

4) CAISP should continue to strive to collect more complete and detailed data to better identify injury patterns relevant to males and females.

APPENDIX A. DENOMINATOR DATA

Canadian Farm Population for 1993, Linearly Interpolated from:
Statistics Canada, Census of Agriculture, 1991 & 1996

Age Group	Male	Female	Total
< 1 year	5103	4883	9986
1-4	23983	22383	46369
5-9	37525	35413	72940
10-14	42593	39727	82321
15-19	42351	36878	79226
10-19	84944	76605	161547
20-29	51165	39132	90300
30-39	63639	61066	124700
40-49	68321	64849	133170
50-59	58985	51062	110050
60-69	44355	31057	75415
70+	21502	14949	36450
Total	**459521**	**401403**	**860921**

APPENDIX B. DATA COLLECTION FORM AND CODING GUIDELINES

Instructions:

The Ontario Ministry of Health has provided us with the hospital separation record for the following patient treated in your hospital for a farm-related injury. Would you please confirm the information below and provide us with the additional information requested on the back of this form. Thank you for your help.

Hospital Information

Chart Number:
Year:
Institution Code:

Patient Information

Date of Birth:
Sex:

Services

Date of admission:
Date of discharge:
Length of stay:
Admission category:
Ambulance required:

Injury Information

Main diagnosis (N-Code):
External cause of injury (E-Code):

Is the above information correct? (circle number)

1 YES
2 NO ---> Please comment on any corrections:

Was this patient transferred from another hospital? (circle number)

1 YES ---> (Please tell us which hospital: _____)
2 NO

Was this a readmission for a previous injury? (circle number)

1 YES ---> Date of original injury: _____ / _____ / _____ (yr/mo/dy)
2 NO

If this was not a farm-related injury, please describe what type of injury this was:

_____

*If injury **was** machinery or vehicle related, begin with question 2.*

*If injury **was not** machinery or vehicle related, begin with question 1 and proceed to question 4.*

1. Describe the main cause of injury (circle answer which best applies):

1 crushed by animal (specify type of animal: _____)
2 struck by animal (specify: _____)
3 fall from animal (specify: _____)
4 struck by object
5 struck against object
6 caught in/ under/ between objects
7 fall from height
8 fall on same level
9 jumped to lower level
10 overexertion
11 drowning
12 exposure to fire
13 contact with temperature extremes
14 contact with electric current
15 cause unknown
16 contact with radiations, caustics, toxic or noxious substances: by (circle): inhalation ingestion absorption
specify agent: _____
17 other (specify): _____

2. If this was a machinery injury, please specify in more detail the mechanism of the injury (circle number):

1 sideways rollover
2 backwards rollover
3 unspecified rollover
4 entangled in machinery
5 pinned or struck by machine
6 motor vehicle collision
7 operator fell from machine, not runover
8 operator fell from machine, then runover
9 passenger fell from machine, not runover
10 passenger fell from machine, then runover
11 runover of operator
12 runover of passenger
13 runover of bystander
14 other (specify): _____

3. If machinery was the main cause of injury, please specify the type of machinery (circle number):

1 tractor
2 grain auger
3 mower
4 power-take-off
specify machinery pto attached to: _____
5 baler
6 farm wagon
7 combine
8 power tool (not chainsaw)
9 chainsaw
10 welder
11 harvester
12 plough/disk
13 hay elevator
14 manure spreader
15 unknown
16 motor vehicle (specify): _____
17 recreational vehicle (specify): _____
18 other farm implement (specify): _____

4. Please describe (with as much detail as possible) the circumstances surrounding the injury event:

5. What was the injured person doing at the time of the injury?

6. Please list the injuries associated with this event (from most to least important): e.g. fracture, arm

nature of injury: _____ body part: _____
nature of injury: _____ body part: _____
nature of injury: _____ body part: _____

7. Please describe the location of injury (circle one):

1 Field
2 Barn
3 Silo
4 Shed
5 Farm Yard
6 Road/Highway
7 Driveway
8 Farm House
9 Farm Road
10 Unknown
11 Water source (e.g. ditch, dugout, pond, etc.)
12 Other (specify): _____

CODING GUIDELINES

Chart number

From CIHI database.

Year of Hospitalization

From CIHI database.

Institution Code

From CIHI database.

Date of birth

From CIHI database.

Sex

From CIHI database.

Date of admission

From CIHI database.

Date of discharge

From CIHI database.

Length of stay

From CIHI database.

Admission category

From CIHI database.

Ambulance required

From CIHI database.

Main diagnosis (N-Code)

From CIHI database.

External cause of injury (E-Code)

From CIHI database.

Information correct

Circle appropriate number (1-YES; 2-NO).
If 2 then specify corrections.

Transfer

Circle appropriate number (1-YES; 2-NO).
If 2 then specify institution from which patient was transferred.

Readmission

Circle appropriate number (1-YES; 2-NO).
If 1 then specify date of original injury (yy/mm/dd).

Type of injury (if not farm-related)

Describe type of injury, if not farm-related.

Cause of injury

Circle appropriate number if injury event was not machinery or vehicle related (leave blank if injury was machinery or vehicle related):

1 crushed by animal
2 struck by animal
3 fall from animal
4 struck by object:
    flying object
    swinging or slipping object
    rolling, sliding object on floor
    falling object during handling
    falling object, NEC
    struck by, NEC
5 struck against object:
    struck against moving object
    step on stationary object
    struck against stationary object
    struck against, NEC
6 caught in, under, or between
    compressed/pinched by rolling, sliding/shifting objects
    a moving and a stationary object
    two or more moving objects

land slides and cave-ins
collapsing materials
caught in, under or between, NEC

7 fall from height
from scaffolds, walkways, platforms, etc.
from ladders
from roof
from piled or stacked materials
on stairs or steps
into shafts, excavations, floor openings, etc.
through floor surface
from ground level to lower level
fall from elevation, NEC

8 fall on same level
fall to the walkway or working surface
fall onto or against objects
fall on same level, NEC

9 jumped to lower level
from scaffold, platform, loading dock
from structure, structural element, NEC
from nonmoving vehicle
to lower level, NEC

10 overexertion
in lifting objects
in pulling or pushing objects
in holding, wielding or throwing objects
overexertion, NEC

11 drowning

12 exposure to fire
fire in residence, building, or other structure
forest, brush, or other outdoor fire
ignition of clothing from controlled heat source
fire, NEC

13 contact with temperature extremes
general heat - atmospheric or environmental
general cold - atmospheric or environmental
hot objects or substances
cold objects or substances
contact with temperature extremes, NEC

14 contact with electric current

15 cause unknown

16 contact with radiations, caustics, toxic or noxious substances
by inhalation
by ingestion
by absorption
contact with radiations, caustics, toxic or noxious substances, NEC
(including viruses, bacteria, etc.)
17 other

If	1,2,3	then	specify type of animal
If	16	then	circle method of contact (i.e. inhalation, ingestion, or absorption)
		and	specify agent
If	17	then	specify other cause of injury

Type of machinery

If injury was machinery/vehicle related, circle appropriate number to indicate type of machinery/vehicle.

If injury was not machinery/vehicle related, then leave this item blank.

1 tractor
2 grain auger
3 mower
4 power-take-off
5 baler
6 farm wagon
7 combine
8 power tool (not chainsaw)
9 chainsaw (other types of saws?)
10 welder
11 harvester
corn picker
potato picker
12 plough/disk
13 hay elevator
conveyer
14 manure spreader
15 unknown
16 motor vehicle
17 recreational vehicle
18 other farm implement

If	4	then	specify the type of machinery to which the pto was attached
If	16	then	specify type of motor vehicle
If	17	then	specify type of recreational vehicle
If	18	then	specify other type of farm implement

Mechanism of injury

If injury was machinery/vehicle related, circle appropriate number to indicate mechanism of injury.

If injury was not machinery/vehicle related, then leave this item blank.

1 sideways rollover
2 backwards rollover
3 unspecified rollover
4 entangled in machinery
5 pinned or struck by machine
6 motor vehicle collision
7 operator fell from machine, not runover
8 operator fell from machine, then runover
9 passenger fell from machine, not runover
10 passenger fell from machine then runover
11 runover of operator
12 runover of passenger
13 runover of bystander
14 other

If 14 then specify other mechanism of injury.

Description of injury event

Describe circumstances of injury event in as much detail as possible.

Activity at time of injury

Describe what person was doing at the time of the injury.

Injury by anatomical site

List nature of injury (e.g. fracture) and anatomical site (e.g. femur) from most to least serious.

Immediate location of injury

Circle appropriate location of injury.

1 field
2 barn
3 silo
4 shed
5 farm yard
6 road/highway

7 driveway
8 farm house
9 farm road
10 unknown
11 water source (e.g. ditch, dugout, pond, etc.)
12 other

If 12 then specify other location of injury.

APPENDIX C: DECISION RULES FOR INCLUSION/EXCLUSION

Fatal Farm Injuries

Definition:

Injuries are included in this analysis if they meet the following definition: Any unintentional injury involving death that:

1) occurred during activities related to the operation of a farm; and/or
2) involved any hazard of a farm environment in Canada.

Deaths due to secondary complications

People who are injured at farm work, then subsequently died in hospital from complications secondary to injury are included in analysis. e.g. embolism, respiratory distress

Alcohol involvement

These deaths are included in analysis so long as the injury leading to death involved farm work or a farm hazard. Drunkenness is considered to be one of perhaps several factors that caused the death.

Fires

Fires in farm residences, where the source of the fire was not a farm work hazard (eg stored gasoline), are excluded. Fires in barns and other outbuildings that are clearly associated with the farm operation are included, as are fires involving agricultural machinery.

Vehicle maintenance

Deaths that occurred during the maintenance of a motor vehicle (eg cars, trucks and vans) were excluded from the work-related database. This included deaths due to carbon monoxide poisoning in garages and sheds.

Deaths resulting from exposure

Deaths resulting from exposure (heat exhaustion or freezing/hypothermia) are excluded from work-related fatality analysis, except if victim was injured during the course of farm work and died since they could not get to safety. Exposure is a newly recognized and important pattern of injury in the farm environment.

Suicides

Completed suicides are exclude from the database, as are other deaths where the investigating coroner or medical examiner judged that the death was probably due to suicide. Deaths where the possibility of suicide was mentioned on the death certificate or coroner's/medical examiner's report, but where the final cause of death was judged to accidental, are included.

Firearms deaths

Deaths involving firearms (e.g. gunshot wounds), where the gun involved was clearly a tool used in the course of farm work, were included so long as the death was ruled as accidental and occurred on a farm or ranch holding.

Animal mauling

Where the death was caused by an animal mauling involving non-agricultural animals (e.g. dogs), these deaths were excluded from the work-related database.

Collisions on highways

Collisions on highways that involved a tractor or other agricultural machinery are included. This included collisions with trains, other vehicles and single vehicle accidents. Collisions involving farm trucks or cars are excluded as these are not consistently identified in all provinces.

Personal aircraft

These deaths were included as work-related deaths if it was clear that the activity at the time of death was related to farm work.

Deaths involving recreational vehicles

Death involving recreational vehicles, such as ATV's, dirt bikes and dune buggies were excluded from the work-related analysis if it was not clear whether their use was farm-related.

Children at play

Children who died while playing in the farming environment were excluded from the work-related analysis unless their death was a direct result of a situation where an individual was involved in farm work.

Hospitalized Farm Injuries

Definition:

Injuries are included in this analysis if they meet the following definition: Any unintentional injury (to any person) resulting in hospitalization that was: 1) caused by agricultural machinery, and/or 2) occurred on farm property, as indicated by the "location of injury" codes used in hospital discharge data.

Readmission to hospitals

In this analysis, we are studying incident cases of farm injury resulting hospitalization. Re-admissions are excluded, if the initial admission is in the database.

Transfers between hospitals

Where an injury victim is admitted to more than on hospital for treatment of the same injury, only one of these encounters with the hospital system is counted in the database.

Deaths that occur in hospital

Deaths that occur in hospital due to farm injuries, where the victim dies in hospital, are excluded from the analysis of hospitalized injuries. The reason for this is to avoid double counting of these events in the CAISP fatality and hospitalization registries.

Hospitalizations due to secondary complications

People who are injured at farm work, then subsequently are hospitalized for complications secondary to injury are included in analysis. e.g. cellulitis

Alcohol involvement

Injury events where alcohol is involved are included in analysis.

Fires

Fires in farm residences, where the source of the fire was not a farm work hazard (e.g. stored gasoline), are excluded.

Other injuries in farm residences

Hospitalized injuries occurring in the farm residences (house) are excluded, unless it can be demonstrated that the injury was caused by some aspect of farm work.

Vehicle maintenance

Hospitalized injuries that occurred during the maintenance of a motor vehicle (e.g. cars, trucks and vans) were included. In general, we consider this to be a hazard of the farm environment.

Hospitalized injuries resulting from exposure

Hospitalized injuries resulting from exposure (heat exhaustion or freezing/hypothermia) are included provided that they meet the above definition of a hospitalized farm injury.

Intentional hospitalized injuries (e.g. assault, attempted suicide)

These are excluded from the database.

Hospitalized injuries involving firearms

Hospitalized injuries involving firearms (e.g. gunshot wounds), where the gun involved was clearly a tool used in the course of farm work, were included.

Pre-existing medical conditions

Hospitalized injuries where a pre-existing medical condition (e.g. seizures, heart attack) is identified are included. These are viewed as potential contributing factors in the injury events.

Transportation injuries

The International Classification of Diseases defines transportation injuries as injuries involving a device designed primarily for or being used at the time for conveying persons or goods from one place to another. In the context of this database, these types of injuries may include: falls from animals, aircraft crashes, on-road ATV events, and on-road collisions involving farm machinery.

* An important limitation is that these injuries are not collected in the CAISP hospitalized registry in a consistent fashion across the country.*