

Final Performance Report

Childhood Agricultural Trauma Evaluation System

5R01 OH004265-4

(In Response to RFA: OH-00-005
Research to Strengthen Occupational Safety and Health Surveillance)

February 9, 2006

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Sponsor

This research was supported by the U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.

NIOSH Grant 5R01 OH004265-4

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LIST OF ABBREVIATIONS

CATES	Acronym for Project Title: C hildhood A gricultural T rauma E valuation S ystem
CI	Confidence Interval
IRB	Institutional Review Board
MDH	Minnesota Department of Health
NIOSH	National Institute for Occupational Safety and Health
OR	Odds Ratio
WSWS	<i>Work Safe Work Smart</i> Curriculum

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ABSTRACT

Background: Agriculture is one of the most hazardous industries in Minnesota and rural Minnesota adolescents are frequently employed in both agricultural and non-agricultural jobs. Previous surveillance studies of agricultural work and injury have generally been limited to emergency room data, surveys of only farm families, or inclusion of only paid work activities. Consequently, the broader scope of work experiences, injuries and illness among adolescents in rural or agricultural communities has been less well characterized. The purpose of this study was to develop and implement surveillance methods to more broadly characterize injury, work, and asthma occurrence among rural Minnesota adolescents. The specific aims of this study were: (1) determine the magnitude and scope of agricultural injury and asthma among adolescents in 9th - 12th grades in rural Minnesota; (2) describe the change in work hours between 9th and 12th grades in terms of total work hours, and the shift in work hours between agribusiness, traditional family farm work, and non-farm work; (3) evaluate the reliability of adolescent self-reported information about agricultural and non-agricultural work hours and injury experiences; and (4) use a cohort analysis to calculate rate ratios for risk factors for injury and to facilitate planning for future prevention and intervention activities.

Methods: Self-completed in-school questionnaires were developed and used to ascertain injuries, work experiences, asthma, and potential risk factors among adolescents attending a stratified random sample of 41 rural Minnesota high schools from four agricultural regions and three categories of school size. Questionnaires were administered to students four times over two consecutive school years. Fall surveys ascertained events from the previous summer while spring surveys ascertained events during the school year. All 9th, 10th, and 11th grade students were asked to complete the questionnaires during the first year, and all 10th, 11th, and 12th grade students were asked to complete the questionnaires the second year. Participation declined with each survey; the initial survey included 13,869 participants from 41 high schools, while the fourth and final survey included 7,802 participants from 35 schools. A brief midyear work and injury survey was administered to a sample of students during the second year to evaluate differing periods of recall.

Results: Using a very broad definition of work (paid or unpaid work or chores), this study found that the vast majority of rural Minnesota adolescents are engaged in work or chores. Data from the most complete surveys (first year) showed that just over 80% of 9th-11th grade students

reported some work during the summer, while 65% worked at some point during the school year. More girls reported working than boys both during the summer and school year, and the proportion of adolescents working, as well as their work hours, increased with grade level and age. About one out of ten reported jobs were related to agriculture. The majority of agricultural jobs were with traditional farms and there appeared to be no shift toward agribusiness work versus traditional farm work. Among students who completed all four surveys, 23% reported at least one agricultural job over the two-year period. About 9% of adolescents reported one or more injuries both during the summer and during the school year. About one in five injuries occurred at work during the summer and about one in eight injuries occurred at work during the school year. Agricultural injuries were reported by 0.5% of students during the summer and by 0.3% of students during the school year. In a multivariate analysis, age, current smoking, agricultural work, farm residence, obesity, and increased work hours were significantly associated with work-related injury during both the summer and school year. Male gender and reduced sleep hours were also significantly associated with work-related injury during the summer. Among students who completed all four surveys, about 4.5% of working students reported at least one agricultural injury. Ever-diagnosed asthma was reported in 12.6% of students during the initial survey and smoking, female gender, and obesity were significantly associated with risk of asthma, while farm residence was protective. There was inconsistent evidence of a recall bias for injury and work.

Conclusions: This survey confirms that the great majority of rural Minnesota adolescents participate in work or chores, both during the summer and school year. Many rural youth are engaged in agricultural work activities, regardless of whether they reside on a farm. About one in ten jobs were related to agriculture and there was no evidence of a shift in patterns of agricultural work over the span of this study. Work-related injuries comprised only a small portion of total injuries, and agricultural injuries represented a small proportion of total work-related injuries. Nearly one in eight students reported ever-diagnosed asthma. Falling participation rates and a sharp decline in reported rates of multiple-item survey questions (injury, work, asthma) on the second year surveys limited their usefulness and suggest that fewer or shorter surveys are warranted. Survey data should be useful in targeting intervention and prevention activities.

SIGNIFICANT FINDINGS

Aim 1: Determine the magnitude and scope of agricultural injury and asthma among adolescents in 9th - 12th grades in rural Minnesota through development of new school-based surveillance methods.

The magnitude and scope of injury and asthma in this study were ascertained through the development of in-class self-completed student questionnaires administered four times over two consecutive school years to a stratified random sample of rural Minnesota high schools. All 9th, 10th, and 11th grade students were targeted during the first year, and all 10th, 11th, and 12th grade students were targeted during the second year, thus in principle, following the same cohort of students over two years.

In this study, injuries were defined as any injury that met at least one of three criteria: restricted normal activities for at least four hours, resulted in any loss of consciousness, and/or caused the individual to seek a professional health care provider. Students could report up to four injuries and four jobs on each survey. The proportion of students reporting at least one injury (at work, school, or other location) during the summer 2001 (June-August) was 8.9%, while for the following 2001-02 school year (September to May) the proportion was 8.7%. A much lower rate of injury (4.8%) was reported for each of the following two survey periods (summer 2002, school year 2002-03), but there was significant evidence that the decrease in reported rates on the final two surveys represent a decreasing willingness to answer “yes” to questions with many follow-up questions, rather than an actual decline in rates.

Work-related injuries comprised only a small portion of total injuries, and agricultural injuries represented a small proportion of total work-related injuries. Of the total injuries reported during the summer 2001, about one in five (22%) were work related, and about one in five (21%) of the work injuries were in turn related to agricultural work. During the following school year, one in

eight (13%) injuries were work-related, and of the work-related injuries, about one in six (17%) were related to agricultural work.

The proportion of students who reported any work-related injury was 1.9% for summer 2001 and 1.2% for the following school year. Among working students only, the rate of work-related injury was 2.4% for summer 2001 and 1.6% for the following school year.

At least one agricultural work injury was reported by 0.5% of working students during the summer 2001 and 0.3% during the following school year. The proportion of students reporting an agricultural injury was two- to three-fold higher among boys for all but the final survey (in which a total of only five agricultural injuries were reported). The agricultural injury rate was ten- to 20-fold higher on all surveys for students residing on a farm compared to non-farm residents. No significant differences or trends in agricultural injuries were found by grade level.

In a multivariate analysis of work-related injuries during the summer 2001, the risk of work-related injuries was significantly associated with male gender, current smoking, having an agricultural job, residing on a farm, being overweight ($BMI \geq 85^{\text{th}}$ percentile for age), less than 60 hours sleep/week, and increased work hours. No significant association was found for age or race. The risk of work-related injury during the following 2001-02 school year was significantly associated with increasing age, current smoking, agricultural work, being overweight, and total work hours. No association was found for gender, farm residence, race, or sleep hours.

For both survey periods, the largest risks of work-related injury were related to current smoking, agricultural work, and increased work hours. For the summer 2001 period, the risk of work injury was 1.68 for current smokers (95% CI = 1.34-2.11), 1.89 for agricultural work (95% CI=1.45-2.47), and 3.56 for upper third of a work hours index compared to the lowest third (95% CI=2.75-4.60). For the subsequent school year, the risk of work injury was 2.38 for current smokers (95% CI=1.76-3.22), 2.06 for agricultural work (1.35-3.15), and 2.49 for highest third of work hours (95% CI=1.65-3.76).

The prevalence of asthma among rural Minnesota adolescents from the first and most complete survey have been published and are briefly summarized here. Among the students in grades 9-11 who completed the initial survey in fall of 2001, almost one in eight (12.6%) reported ever having been diagnosed with asthma and 9.2% reported that they currently had asthma. A notable finding in this analysis was that students living on farms reported significantly less wheezing and asthma than their rural non-farm counterparts (wheezing OR=0.83; ever-diagnosed asthma: OR=0.78; current asthma: OR=0.77).

Other key findings:

- No difference was found in asthma or wheezing by type of farm (livestock versus crop-only).
- Overweight students (BMI \geq 85th percentile) were more likely to report wheezing and asthma.
- Students who were current smokers were more likely to report wheezing and asthma.
- Students exposed to smoking at home were more likely to report wheezing but just as likely to report asthma as those not exposed to smoking at home.
- Asthma rates for girls increased by age (14-17) while the rates for boys decreased by age.
- The increase for girls could be largely explained by simultaneous increases in smoking rates.

Of students reporting current asthma, 19%-24% reported that their asthma was work-related. Among working students not living on a farm, no difference was found in ever-diagnosed asthma rates between students working farm jobs or non-farm jobs.

Aim 2: Describe the change in work hours between 9th and 12th grades in terms of total work hours, and the shift in work hours between agribusiness, traditional family farm work, and non-farm work.

Self-reported “typical” weekday and weekend hours (averaged over the number of jobs) were used as an indicator of work hours in the absence of the standard measure of weekly work hours. For total work hours (all jobs), there was a significant increasing trend with grade level (i.e., age) for both weekday and weekend hours at all four survey periods. In addition, weekday hours were slightly, but consistently higher than weekend hours for both summer periods, while weekend hours were sharply higher than weekday hours for the two school-year periods. There were several small but significant differences in reported work hours by gender. Girls reported slightly

higher weekend work hours during the two summer surveys, while boys reported slightly higher weekday hours for three of the four survey periods. Some but significant increases in work hours were found for 10th and 11th grade students comparing summer to summer and school year to school year over the two year period (these grades participated in all four surveys). Longitudinal trends must be viewed very cautiously in this study due to sharp declines in participation and a likely underreporting of work on the second year surveys.

Work hours were also examined for farm work, agribusiness work, and non-agricultural work. It was hypothesized at the outset of this study that the significant decline in the number of family farms and the increase in corporate or partnership farms that occurred into the mid-1990s may be reflected in changing agricultural employment patterns in rural youth. However, that trend in farm types did not persist over the time frame of this study and little evidence of a shift in adolescent work hours by farm type was observed.

The proportion of jobs involving agriculture was remarkably constant at about 10% across all four surveys. And among agricultural jobs, there was no significant variation in the proportion of jobs related to family farms (80%) vs. agribusiness. The work hours and trends for non-agricultural jobs, as expected, were virtually identical to total jobs, since the vast majority of jobs were non-agricultural. A slightly different pattern was found for agricultural jobs. The varying ratios for weekday/weekend hours for summers and school years were comparable to non-agricultural jobs. However, there were no consistent trends in work hours by grade level for either farm jobs or agribusiness jobs although, in almost all cases, those in the highest grade level at each survey had the highest average work hours. With respect to gender, boys had significantly higher weekday hours and weekend hours at all survey periods. Finally, work hours were also examined on the basis of farm residence. As might be anticipated, farm residents reported a greater number of work hours than non-farm residents in agricultural jobs for all survey periods. For non-agricultural jobs, the reverse pattern was found: farm residents consistently reported fewer weekday and weekend hours than non-farm residents for non-agricultural jobs. For agricultural jobs, no significant differences in mean weekday or weekend work hours were found between the two summer surveys or between the two school year surveys.

Aim 3: Evaluate the reliability of adolescent self-reported information about agricultural and non-agricultural work hours and injury experiences.

The originally proposed protocol for assessing reliability of self-reported information was modified due to data privacy restrictions on the final approved protocol. A revised protocol, implemented during the second year, involved a short mid-school year survey to a sample of students assessing injury and work experience. Responses were then compared to their end-of-the-year-surveys for events that occurred in the same September-December time frame to examine evidence for a “recall bias.” The maximum recall period for the midyear survey was approximately four months, while the maximum for the end-of-the-year survey was 8-9 months.

Of the originally targeted sample selected for this midyear survey, only 50% (N=383) participated and/or could be matched to their spring surveys. This greatly reduced the number of events (injuries and work) that could be compared between the two surveys.

For work experiences, the overall agreement was 72%, with 153 students reporting work (September-December) at both surveys, and 115 reporting no work on both surveys. Fifteen students reported work only on the spring survey, while 87 students reported work only at the midyear survey. The kappa statistic was 0.46. Using the midyear survey as the “gold standard” the sensitivity of the spring survey was 0.64 and the specificity was 0.89.

An index of weekly work hours was also compared for total jobs as well as for agricultural jobs. Students reported significantly fewer work hours for agricultural tasks on the spring survey compared to the midyear survey (0.79 hours vs. 0.31 hours, $p=0.005$), but no difference in total work hours (15.7 vs. 15.5, $p=0.82$). The same pattern was found when restricted to only those students reporting work on both surveys.

Due to the small numbers of injuries, only total injuries could be compared and even then, there were very few injuries in which to evaluate reliability. While the overall level of agreement

(92%) was higher than for work experiences, this was due to the large proportion of students reporting no injuries. The chance corrected agreement between the two surveys was relatively low ($\kappa=0.26$). Seven students reported an injury during the specified time period on both surveys; five students reported an injury on the spring survey but not the midyear survey, while 28 students reported an injury only on the midyear survey. Using the midyear survey as a “gold standard”, the sensitivity of the spring survey was a poor 0.20, while the specificity was high at 0.99. Overall, 9.1% of students reported an injury on the midyear survey, while only 3.1% of these same students reported an injury (during that period) only three months later on the final survey. If taken at face value, these data would suggest a substantial recall bias; however, these findings must be interpreted very cautiously due to the very small numbers, inconsistencies with other findings, and a general decline in reporting key outcomes on the final surveys. For example, there was no greater agreement on reported injuries that were presumably more severe (those requiring a healthcare visit or those restricting activities). Also, reported injury rates from both end-of-school-year surveys showed no difference in reported injury rates for injuries that occurred earlier during the fall semester vs. the more recent spring semester. Finally, and most importantly, on the second year surveys we found significant decreases for “yes” responses to questions – such as work, injury, and asthma – that required multiple follow-up responses, given a “yes” response to the initial question. Other survey data and labor statistics showed no corroborating evidence that the reported declines were real. Thus, the apparent false negative injury reports on the spring survey are more likely related to a “survey fatigue” arising from repeated exposure to the same questionnaire and recognition that a “no” response to multipart items would allow completion of the survey in a much quicker fashion.

Because the recall study findings provided only weak and inconsistent evidence of a true recall bias, we did not believe that a statistical adjustment of the injury data was warranted. We believe that data from the first year surveys provide the best and most representative estimates of injury, work, and asthma for rural Minnesota adolescents.

Aim 4: Use a cohort analysis to calculate rate ratios for risk factors for injury and to facilitate planning for future prevention and intervention activities.

By surveying essentially the same students four times over two consecutive years (although invoking different periods of recall), this study design allowed a limited longitudinal component. These four surveys covered two successive summers and school years (from June 2001 through May 2003). Unfortunately, in practice, this Aim could only be partially addressed due to a variety of limitations of the data. Due to the absence of personal identifiers, declining school participation rates on successive surveys, and student absences, only 5,618 of the original 13,869 participating students could be followed through all four surveys. In addition to the greatly reduced sample size of this “cohort” subgroup, two additional factors limited conclusions that could be drawn from this subgroup. First, as described above in Aim 3 with the recall bias analyses, there was an apparent general tendency of students to underreport items requiring multiple follow-up questions on the final two surveys. Second, there were a number of small (but statistically significant) differences between cohort and noncohort students, as well as several larger differences (e.g., proportion of smokers and those who reside on a farm), thus limiting the generalizability of the findings.

As a result of these limitations, we focused our multivariate analyses for this report on the two first year and most complete and representative surveys, rather than on the cohort subgroup. Those multivariate findings are summarized in Aim 1 above. However, we did utilize the cohort to examine descriptively the cumulative injury and work experiences of the cohort, recognizing that the findings are likely to underrepresent the true occurrence of these outcomes and that the findings may not be generalizable to the whole study population or to rural Minnesota adolescents.

Over nine out of ten students (92.8%) in this subgroup reported at least some work experiences over the four survey periods. The rate was higher among girls than boys, and there was a significant increasing trend with grade level. Almost 38% of students reported some work during *each* of the four survey periods. Again, more girls reported working than boys, and the rate of working increased with grade level. One in four students (25.4%) reported at least one agricultural job during any of the four periods, while 4.5% reported some agricultural work during each of the four periods. About twice as many boys as girls reported agricultural work, by either measure: at least one agricultural job over the two years (33.7% vs. 17.3%); at least some

agricultural work during each survey (6.4% vs. 2.7). There was no significant trend by grade level.

For total injuries, 17.9% of students reported at least one injury during the two-year period. No difference was found between boys and girls, but 9th graders had higher rates than higher grades. 4.6% of students reported a work injury over the two years. The rate of work injuries was significantly higher in boys than girls and the rate increased significantly with grade level. The proportion of students reporting any injury at school (4.5%) was nearly the same as the rate of work injuries. For school injuries, however, there was no significant difference between boys and girls, and there was a significantly decreasing trend with grade level. For all other injuries (not work or school related), 12.5% of students reported at least one injury over the two years. No difference was found between boys and girls, and as with school injuries, there was a decreasing trend with grade level.

Finally, 2.5% of students in this subgroup reported at least one agricultural injury during the two year period. Most (75%) of those reporting an agricultural injury, reported a single injury during the two years. The rate was almost four-fold higher among boys (3.9%) than girls (1.1%). Rates varied by grade level, but there was no evidence of a trend with grade level.

USEFULNESS OF FINDINGS

A major purpose of this study was to develop and implement surveillance methods to more broadly characterize the work, injury, and asthma experiences of rural Minnesota adolescents. This study was largely successful in fulfilling that objective, although a number of factors limit the usefulness and generalizability of a portion of the findings as well as the methods.

Methodologically, this study had a number of strengths that enhance the usefulness of the findings. The sample size and stratified random sample selection and - on the first two surveys- high participation rates, allow the findings to be generalized to other rural Minnesota adolescents. And, as shown in other research, the use of in-school surveys, in addition to reducing costs compared to household surveys, is likely to produce a more accurate reporting of certain characteristics such as alcohol consumption. The use of a passive consent process also contributed to the (initially) high participation.

The broad range of items included on the questionnaire was both a strength and a weakness of this surveillance study. The questionnaire included 60 numbered items; however, many items had multiple follow-up subparts. In the most extreme case, if a participant had had four jobs, four injuries, and asthma, they were asked to read and check approximately 240 responses. While participation and completeness of responses were high initially, by about the third time students had seen the same survey, there was a reduced willingness to complete the survey, or if “completed”, to in effect skip over items by simply checking “no” to the initial multipart question. The sharp drop in participation on the final two surveys and the apparent underreporting of key outcomes limit the usefulness of those surveys and outcomes that depended on the final surveys (such as longitudinal trends). While schools were compensated for their participation, individual teachers and students were not offered any specific incentives. Without such incentives, it does not appear feasible to survey the same adolescents four times over two successive school years with such a lengthy questionnaire.

The very broad spectrum of items included on the questionnaire was also a great strength, contributing to the usefulness of the findings. Injuries were ascertained and characterized according to where they occurred (work, school, other locations), the nature of the injury, and the consequences (disabling problems, school missed, etc.). Work histories included several checklists of items that may confer a risk of injury for either agricultural work (e.g., driving a tractor) or non-agricultural work (e.g., working around hot surfaces). In addition, a variety of other characteristics were ascertained that may be associated with injury or asthma risk but that are also useful in assessing the general health status of rural youth. These include such factors as: farm residence; amount of sleep; time spent in recreation, organized sports, and commuting; driving a vehicle; seat belt use; tobacco use; alcohol use; secondary smoke exposure; and height and weight. The injury, work, and personal characteristics would clearly be helpful in developing and prioritizing intervention and health promotion activities.

The inclusion of asthma and respiratory items greatly enhanced the usefulness of this study. This is the first study to fully characterize the prevalence of asthma and wheezing among rural Minnesota adolescents. This study also determined the extent to which rural youths have Asthma Action Plans, use medications, and missed various activities due to asthma. These data have been presented at a national and state conference, and have had immediate use in the state's CDC-funded asthma control program. A portion of these findings have been published.

While summaries of school-specific and overall findings have been disseminated on two occasions to the 41 participating schools, the usefulness of these findings will be further enhanced by continued dissemination of these findings to other community and school health programs through anticipated published reports, presentations, web resources, and data sharing.

INTRODUCTION and BACKGROUND

Farming has been consistently identified as one of Minnesota's most hazardous occupations (Zaidman 2004). Minnesota Fatality Assessment and Control Evaluation (MN FACE) program has documented serious ongoing injury hazards associated with tractor use (Brown, Parker et al. 1997), augers (Boyle, Parker et al. 1995), grain bins (Boyle, Wahl et al. 1996), and manure pits (Madery and Parker 1993) in Minnesota. Farm work has also been consistently related to child injury-related deaths (Parker and Wahl 1999). From 1999 through 2000, MN FACE documented seven agricultural work related deaths in youth 10-18 years old with 88% between the ages of 13 and 18 years.

Census data indicate that approximately 100,000 adolescents between 14 and 18 years of age reside in rural Minnesota counties. In these rural counties, many adolescents live on and/or work on farms or agribusinesses and are potentially exposed to agricultural hazards. In a survey of six rural Minnesota high schools, Parker and colleagues found that up to 45% of male high school students and 21% female students had had some farm work (Parker, Merchant et al. 2002). In addition, many rural students also had non-farm jobs (Munshi, Parker et al. 2002). Thus, rural Minnesota adolescents who live on a farm may have jobs on and off the farm and adolescents who do not live on a farm may be employed in farming as well as non-farming jobs. Other surveys have shown that approximately 80% of high school students work at some point during their high school years (Runyan and Zakocs 2000).

Specific Aims

Surveillance studies are important in describing the magnitude and scope of agricultural injury and illness. However, many of these research efforts are limited in nature because of their reliance on hospital-based data or surveys of farm families rather than the collection of information on all agricultural injuries and illnesses affecting the broader population of rural communities. Because of this narrow focus, the total impact of the agricultural environment on the health of young workers is not clearly understood.

Thus, the risks faced by all children and adolescents in agricultural communities must be included in surveillance and prevention strategies. The purpose of this study was to develop and evaluate surveillance methods to more broadly characterize injury, work, and asthma occurrence among rural Minnesota adolescents.

The specific aims of this study were to:

1. Determine the magnitude and scope of agricultural injury and asthma among adolescents in 9th - 12th grades in rural Minnesota through development of new school-based surveillance methods;
2. Describe the change in work hours between 9th and 12th grades in terms of total work hours, and the shift in work hours between agribusiness, traditional family farm work, and non-farm work;
3. Evaluate the reliability of adolescent self-reported information about agricultural and non-agricultural work hours and injury experiences; and
4. Use a cohort analysis to calculate rate ratios for risk factors for injury and to facilitate planning for future prevention and intervention activities.

METHODS

In brief, this study utilized self-administered questionnaires to ascertain injury, work experience, asthma, and possible risk factors among adolescents from a stratified random sample of 41 high schools in rural Minnesota counties. Questionnaires were administered four times over two consecutive school years. The methods are described below.

“Youth at Work” Partnership

The primary goal of this grant was to develop and evaluate survey-based in-school surveillance methods to collect information on work activities, asthma, injury occurrence, and risk factors related to injury or asthma in a cohort of rural Minnesota adolescents attending public high schools. This grant was awarded to the MDH at the same time (Fall 2000) that a second NIOSH grant (R01OH004220) was awarded to the MDH, “Childhood Agricultural Safety and Health -- Evaluation of School-Based Agricultural Health and Safety Curriculum: *Work Safe Work Smart*.” The Principal Investigators, project directors, and other key staff were in the same unit of the MDH (Center for Occupational Health and Safety), and several staff had roles on both projects.

The protocol for both grants called for recruitment of a stratified random sample of rural Minnesota high schools from each of four agricultural regions of the state. Due to the shared target population, the anticipated difficulty in attempting to recruit rural high schools from around a very large state for two projects, careful consideration was given at the outset of these projects as to whether, or how, they could share and/or collaborate on various components of the projects such as sample selection, recruitment, and other administrative activities (e.g. school and printing contracts). After careful review of each project’s objectives, proposed methodologies, sample size requirements, etc., MDH project staff and collaborating researchers from the University of Minnesota determined that utilizing a common protocol for sample selection and recruitment and certain other administrative tasks were technically feasible and would reduce time and costs. To further facilitate recruitment efforts, it was also decided to represent both projects under a single unifying theme. This theme became: “*Youth at Work: A Partnership for*

Adolescent Work Safety.” A *Youth at Work* logo was developed and was used on all communications to schools and other collaborators. Schools were invited to participate in the *Youth at Work* project, described as having two components: (1) a curriculum evaluation and (2) an injury, asthma, and work experience survey. Both projects would involve surveys administered over two academic years. A *Youth at Work* recruitment fact sheet is shown in Appendix C.

Advisory Board

An Advisory Board was formed consisting of professionals from agricultural education, health education, school administration, epidemiology and occupational health and safety (see Acknowledgments). Specific functions of the Advisory Board included: promoting participation in the *Youth at Work* studies to state, regional and community entities; identifying possible key personnel in each school; determining how and when to contact these individuals; and assisting the study investigators in preparing recruitment materials. The board met a total of five times from December 2000 through November 2002.

Student Questionnaires

The main method of data collection in this study was an in-school self-completed questionnaire. The questionnaires were administered at the start and end of the school year for two consecutive school years (2001-2002 and 2002-2003). The Fall questionnaire (Appendix A) inquired about work and injuries that occurred the preceding summer, while the Spring surveys inquired about events that occurred during the current school year. Since one of the goals was to follow the students over two years, the surveys were to be administered to all 9th, 10th, and 11th grade students at the school during the first year, and to all 10th, 11th, and 12th grade students during the second year of the survey.

As shown in Appendix A, the 12-page questionnaire included nine pages of questions containing some 60 items (with many subparts for certain items). Items included on the questionnaire were based on previously used student surveys of work and injury as well as factors identified in the

literature that might be associated with work-related injury or asthma (Figure 3). The Fall surveys differed from the Spring surveys only in terms of the time period covered for work and injury experiences: the Fall survey asked about events during the previous summer months – (June, July, August), while the Spring surveys asked about events during the current school year (September through May or the date of the survey).

The questionnaire included demographic items (age, race, age, farm or non-farm residence, BMI); work experiences (type of job, hours worked, duration of work); injury occurrences including the place where the injury occurred (work, school, other), type of injury, body part, and any consequences of the injury (e.g., lost school days); asthma and wheezing occurrence; and other personal factors that might be associated with injury or asthma risk (e.g., hours of sleep, hours at school, smoking history, alcohol use, school performance, hours participating in organized or recreational sports). Household factors related to injury were not included due to the length of the questionnaire.

For this survey, the following key definitions were used:

<u>Farm residence</u> (Q5):	“A Farm is defined as any place that would produce or sell \$1,000 or more of agricultural products”
<u>Work</u> (Q19-27):	<p>“Work includes:</p> <ul style="list-style-type: none"> • Paid or unpaid employment at or away from your home • Chores or work done for your family, such as lawn care, babysitting, dishes • Chores or work done outside your home • Seasonal activities such as working harvest or lifeguarding”
<u>Injury</u> : (Q28-38)	<p>“There are many different kinds of injuries: burns, broken bones, bruises, cuts, strains, sprains, or poisoning. This question asks about any injury or accidents that:</p> <ul style="list-style-type: none"> • Restricted your normal activities for at least 4 hours; AND/OR • Resulted in a loss of consciousness, loss of awareness or amnesia for any length or time: AND/OR • Caused you to seek professional health care, including care by doctors, nurses, chiropractors, dentists, or other healthcare professionals.”
<u>Asthma</u> (Q53):	“Has a doctor every told you that you have asthma?”

Sample Selection

Eligibility criteria of schools included the following characteristics: (1) a public high school; (2) at least 20 students in each of grades 9 through 12; (3) located in a rural county as defined in the United States Department of Agriculture (USDA) Urban-Rural Continuum Codes for Metropolitan and Non-metropolitan Counties (Butler and Beal 1994); and (4) not located in Meeker, McLeod or Sibley counties (schools in these counties participated in previous intervention and surveillance activities). Because farm hazards vary based on the type of farming, students working within different types of agricultural environments may have different work and injury experiences. Therefore, it was decided to identify major agricultural regions within the state and to stratify on these regions in school selection. Information from the Minnesota Department of Agriculture was used to identify the top ten counties producing each of Minnesota's major agricultural products (e.g., dairy, swine, sugar beets). These counties were subsequently mapped by agricultural product into four geographic regions (Figure 1) as follows:

Region 1) swine, corn, and soybeans;

Region 2) dairy and poultry;

Region 3) forestry and wild rice; and

Region 4) sugar beets and small grains such as wheat

A list of all Minnesota public high schools was obtained from the Minnesota Department of Education (formerly known as the Department of Children, Families, and Learning). Based on the eligibility criteria, it was determined that 190 rural high schools met the initial eligibility criteria. General characteristics and student populations of these schools by region and grade are shown in Table 3.

x

In addition to region, school size (enrollment) was postulated to be a potential factor related to various predictors or outcomes (e.g., smaller schools may be in more rural areas, thus affecting the types of employment possible as well as the likelihood of living on a farm). In addition, it was believed that including a more representative range of school sizes might enhance the study

inferences. Thus, a size stratum based on the school's student population was established as follows:

Size Stratum 1 (small): 90-169 students;

Size Stratum 2 (medium): 170-560 students; and

Size Stratum 3 (large): 561-1600 students.

Sample size analyses indicated that a sample of 32 schools (seven schools each from Regions 1, 2, and 3; 11 schools from Region 4) would be sufficient for the aims of this project under a reasonable range of assumptions. However, a somewhat larger sample of schools was required for the concurrent *WSWS* curriculum evaluation study (which was limited to a specific grade at each school). Power calculations for that study suggested that ten schools from each agricultural Region would need to be selected (and subsequently randomized into five intervention and five control conditions) for a total of 40 schools. As noted above, one additional CATES-only school from Region 4 was required (to bring the total to 11); thus, a total of 41 schools would need to be recruited to satisfy the needs of both concurrent projects.

School selection proceeded as follows. All eligible schools were first assigned a random number. Schools were then sorted in ascending order by region, then size, and random number. (For the curriculum evaluation, schools within a region and stratum were then randomized to an intervention or control status.) The first schools encountered in each region and stratum (starting with the smallest random number) were approached for recruitment into *Youth at Work*. If a school refused, the next (randomly sequenced) school in that region and stratum was approached until the complement of schools for each region and stratum was filled. Schools did not know before they agreed to participate whether they would be an intervention or control school for the curriculum evaluation component. For each region, the goal was to recruit four small schools (stratum 1), four medium schools (stratum 2) and two large schools (stratum 3). (One additional school would be recruited from Region 4 for the CATES study only.) School selection and participation status is shown in Table 4. A summary of refusals was maintained and is shown in Table 5.

School Recruitment

Since each school district and each school was unique, a flexible recruitment strategy was developed in order to optimize participation. The MDH worked extensively with the Advisory board and the Minnesota School-to-Work program to develop strategies that reduced potential barriers to study participation. For example, all schools received financial support to offset the costs of administering surveys and (for intervention schools, the WSWS curriculum). This support varied depending on whether the school was an intervention or control school and whether they were participating in both *Youth at Work* studies. Generally, during the first school year (when the curriculum was taught), control schools and CATES only schools received \$500 and intervention schools \$3,000. During the second year (in which only surveys were administered), most schools received either \$1,500 or \$2,500, depending on the number of surveys (one curriculum post-test survey and up to three CATES surveys).

As previously noted, a single school recruitment protocol was developed for two concurrent grants under the “Youth at Work” project. Recruitment began with a letter (Appendix C) from the Commissioner of Health to schools outlining Youth at Work goals and an invitation to participate, followed by phone calls from Advisory Group members and project staff to assess potential participation and arrange follow up school site interviews (Figure 2).

Two MDH staff (the original PI of this grant and the original co-PI of the WSWS grant) directed recruitment efforts from January through June 2001, logging approximately 6,500 miles in travel to meet with school administrators and potential teachers.

IRB and FWA Agreements

The study protocol was approved by the Minnesota Department of Health Institutional Review Board (IRB) at the outset of the study. Annual review and renewal by the IRB was obtained and submitted to NIOSH with the annual progress reports.

A designated administrative representative from each participating school completed a Federal Wide Assurance agreement as well as a signed participation agreement regarding their willingness to abide by these criteria and assuring teacher participation (Appendix E).

Study Implementation

Due to the length of the questionnaire and the large number of questionnaires that would be completed (up to 60,000) during the course of the study, the questionnaires (Appendix A) were printed on machine-readable forms. To track participation over time, questionnaires were printed with unique document sequence numbers and a perforated detachable cover sheet. A different color-coded Questionnaire was used for each study timeframe to reduce confusion when administering and processing questionnaires. To eliminate issues of storage of four sets of questionnaires on site for participating schools, questionnaires were labeled and stored at MDH. Mailings to schools took place in Fall 2001, Spring 2002, Fall 2002, and Spring 2003.

In August 2001, all schools submitted to study investigators student rosters for the Fall 2001 term. These rosters were used to create labels for the questionnaires. To insure privacy while maintaining individual participation tracking, the name of the school, student and current grade were labeled on the cover sheet. Written instructions to remove cover sheets and maintain a cover sheet file on site were sent to each school with the first shipment of questionnaires. Contract designated school liaisons mailed completed questionnaires back to MDH.

Data Entry and Management

As noted above, machine-readable forms were utilized for the student questionnaires. An independent contractor scanned completed questionnaires and created electronic data sets for MDH editing, coding, and analysis. Project staff worked closely with the scanning contractor to develop appropriate scanning logic and protocols. To ensure data quality and validity, a data quality test was conducted prior to full-scale scanning comparing data from 200 surveys that

were scanned to data from the same surveys that had been manually entered (double keyed). This quality assurance evaluation resulted in several minor modifications to the scanning and pre-processing programs and demonstrates a very high level of accuracy for data entry via scanning.

A working data dictionary was created to determine scanning criteria and the creation of four, time dependent, electronic raw data sets. Data editing programs were developed by MDH staff to check for consistency of responses (e.g., grade, gender), skip patterns, missing data, multiple responses, and numeric consistency of dates (e.g., age, test date).

Statistical analysis was performed using the Statistical Analysis System (SAS Institute Inc, 1999-2001). This study used a stratified cluster design with schools as the unit of randomization. Where noted, prevalence figures were adjusted to account for the sample design. Univariate analyses and logistic regression was used to examine relationships cross-sectionally (within a single survey), while Poisson regression was used to model outcomes for longitudinal analyses.

Recall Bias Evaluation for Injury

Studies -- such as the current study -- that rely on self-reported injuries are subject to possible recall bias depending on the period of time over which individuals are asked to recall injuries (Langley, Cecchi et al. 1989; Harel, Overpeck et al. 1994; Landen and Hendricks 1995; Zwerling, Sprince et al. 1995; Fraser 1996; Mock, Acheampong et al. 1999; Jenkins, Earle-Richardson et al. 2002; Gabbe, Finch et al. 2003; Petridou, Dessypris et al. 2004; Moshiri, Heuch et al. 2005; Valuri, Stevenson et al. 2005; Warner, Schenker et al. 2005). More distant injuries may be forgotten or they may be reported as more recent events ("telescoping bias"). Previous studies ascertaining injuries over the previous 12 months, for example, have indicated that the rates of injuries will vary depending on the time period (previous month, previous three months, previous 12 months, etc.). This study inquired about injuries over two different time periods: for the two Fall surveys, students were asked to report information from the previous Summer (3 months, May-August) while for the two Spring surveys, students were asked to report information from the just completed school year (9 months, September-May). In addition,

there was wide variation in the actual time that schools administered both the Fall and Spring surveys. Figure 35 shows the distributions of the maximum recall periods for each of the four surveys. As can be seen from this Figure, there was even some overlap in the maximum recall periods for the first two surveys (summer 2001 and school year 2001-02). Nevertheless, on average, there was approximately a 100-day shorter recall period for the Fall surveys compared to the Spring surveys.

The original study protocol called for a recall bias substudy that would have involved surveying a sample of students by mail-in forms every month to inquire about any injuries. However, because the final IRB-approved protocol utilized a passive consent process in which MDH would not retain personally-identifying information and would not contact students, an alternative approach was taken. In this approach, a sample of students completed an abbreviated questionnaire during the middle of the school year (regarding events for September through December) which could then be compared to survey information completed by these same students at the end of the school year. The recall questionnaire would involve a maximum recall period of about four months, while the maximum recall period for the Spring questionnaire recall was approximately eight months.

The Recall Questionnaire was a 12-item questionnaire (Appendix B) addressing the major questions of work, work hours and injury. It was administered during the one-month period between December 15, 2002 and January 15, 2003. The goal was to obtain approximately a 10% sample of students that would be balanced and representative of school region and size, but not potentially influenced by concurrent participation in the curriculum evaluation study. Eight schools were randomly selected from the schools in which only CATES activities occurred (23 of the participating schools did not take part in the dissemination of the *Work Safe Work Smart* curriculum). Additionally, students from grades that had been used as controls for the *Work Safe Work Smart* curriculum also were eliminated from the sample selection to remove the possibility that the exposure to the additional questions regarding work safety and work injury would further sensitize the students and heighten their recall abilities over students who had not participated in any CASH activities. Table 6 describes the sampling frame and the number of participating students in the recall questionnaire administration.

Unlike the Fall/Spring questionnaires, the recall questionnaire did not have a designated identification code to match an individual student with a specific questionnaire number. This was done to maintain confidentiality. Rather, school identification codes, birth date, grade and gender were used to link recall questionnaires with the identical student Spring questionnaire.

Questions on the recall questionnaire included three demographic questions (gender, birth date and grade) to facilitate linkage to Spring questionnaires, four questions about work activities, including if the student worked, type of work and average number of hours of work per weekday/night or weekend day/night, and five questions about injury events, location of injury, month of injury, treatment sought for injury, and activity restrictions due to injury. All questions and definitions for work and injury were identical to those used in the Spring questionnaire. Agreement on work and injury events was evaluated by examining sensitivity, specificity, and the Kappa statistic for overall agreement. Mean “typical” work hours were examined by a paired t-test for all jobs and for agricultural only jobs.

Cohort Identification and Analyses

In addition to the cross-sectional analyses for each of the four surveys, an aim of this study was to examine injury, work experiences, and other risk factors longitudinally. Although this was an open cohort, by following 9th, 10th and 11th grades during the first year surveys and 10th, 11th, and 12th grade students the second year surveys in the same schools, it was anticipated that for at least a portion of students, data from all four surveys would be available. The injury, work experiences, and other factors of a cohort of students could then be examined over two successive calendar years. Identifying the population of students for whom all four surveys were completed proved to be somewhat of a challenge since we were not able to use or retain survey face sheets that included student names. A number of variables were used to match and confirm that all four surveys belonged to the same individual: these included survey ID number, gender, date of birth, school, and grade. As noted below, this Aim had to be modified and limited due to the small number of students who could be matched, declining participation, and a sharp decline in reporting of key variables such as injury and work on the final two surveys.

RESULTS & DISCUSSION

School Recruitment and Retention

The outcome of school selection and recruitment is presented in Table 4. This table lists the order of recruitment, region, stratum, and final status of participating schools at baseline. After recruitment, 66% (41) of the 62 schools actively recruited agreed to participate with three (7%) schools agreeing to participate in the CATES study only. One school initially agreeing to participate in both studies withdrew from both studies just prior to implementation due to personnel cuts, and could not be replaced by that time.

The reasons for schools refusing to participate in the *Youth at Work* project are given in Table 5. In summary, 33% refused participation due to financial cuts and layoffs, 33% for “no specific” reason, 14% said “too busy”, 10% said “too many surveys”, and 10% had incompatible schedules. Because randomization identified schools from parallel school districts, financial cuts and personnel layoffs were seen as comparable for participating and refusal schools.

During the first school year (2001-2002), 41 schools participated in the Fall 2001 survey; while 39 schools participated in the Spring 2002 survey. During the second school year (2002-2003), 37 schools fully participated in the Fall 2002 survey, and another school partially participated (one grade only) in the survey. For the Spring 2003 (and final) survey, 34 schools fully participated, and one school partially participated (two grades only).

Student Participation

Student rosters prepared by the schools just prior to the start of the Fall 2001-2002 school year showed 15,568 students were expected to enroll in the 41 participating schools. As per the original study design, data on student movement (e.g., absenteeism, transfers, drop outs) during the study was requested from each school to follow-up with individual students as well as compare similarities and differences between schools. The completeness of this information from all schools and at each test period was not consistent and is not utilizable for follow-up or

comparison. While some schools could provide explanations for 100% of the non-participants, other schools were not able to provide explanations for any of their non-participants. Of the reasons for non-participation that were provided, the two most common were absences (25% of total missing) and “no longer enrolled” as of the survey date (18% of missing).

Participation was high for almost all schools at the initial (Fall 2001) survey, ranging from 77% to 100%. Of the 41 schools, 31 had participation rates over 90% and the overall participation rate was 89.1% (Table 4). Participation in CATES was similar for schools that also participated in the *WSWS* curriculum evaluation: 91.1% for schools that also implemented the *WSWS* curriculum, and 88.0% for schools that served as controls (pre-tests and post-tests only).

Participation in subsequent surveys declined. As noted previously, several whole schools dropped out of the study at subsequent time points. In addition to these losses, student participation rates also declined among the remaining participating schools. While precise participation rates are not known for subsequent surveys (since the number of eligibles is not accurately known), an approximate estimate can be made based on the Fall school rosters and accounting for the schools that withdrew from the study. We estimate the following student participation rates among schools that remained in the study: Spring 2002 Survey = 79%, Fall 2002 Survey = 78%, and Spring 2003 Survey = 68%. As shown in Table 8, the total number of student surveys completed at each survey was as follows: Fall 2001 = 13,869; Spring 2002 = 10,945; Fall 2002 = 9,073; and Spring 2003 = 7,802.

For the recall bias evaluation, the original targeted sample included 760 students from eight schools. A total of 569 (72%) surveys were returned (Table 5). However, the number of Recall and Spring surveys that could be matched and used for analysis was considerably fewer. Since names were not assigned to the recall questionnaires for privacy reasons, questionnaires were matched on birth date, gender, grade, school, and even individual handwriting on the questionnaires. Through this process a total of 385 recall surveys were matched with Spring questionnaires (61% of the returned recall questionnaires; 50% of the original eligible population). Missing birth dates was the main factor for unmatched questionnaires.

The cohort analyses required tracking individuals over the four surveys. To facilitate subsequent matching, survey cover pages included a student name, along with a unique survey number printed on each page of the survey. Teachers were instructed to hand out the surveys to the student whose name was on the survey. However, this was clearly not always accomplished. Since the protocol did not allow us to retain and use student names, those cover sheets were removed before the school returned the survey, or if the sheets were returned with the surveys, they were destroyed. Matching was therefore based on other criteria, specifically: survey ID number, date of birth, gender, grade, and school. Using this method of matching, the number of students for which all four surveys could be matched was only 5,618. The small number of students that could be matched on all surveys, the loss of participating schools and low participation rates on the final two surveys, and the lower reported rates of key variables (such as injury and work) on the final two surveys resulted in limitations and/or modifications to Aims #3 and #4.

Survey Findings

The detailed findings from this study are shown in Tables 8 –17 and Figures 4 – 36. Unless noted otherwise, all rates or proportions in this report are expressed as percents. Table 8 provides the overall unweighted survey responses for all reported and derived survey items from each of the four surveys. Table 9 shows a more detailed characterization of the work experiences of the study population. Table 10 shows the key frequencies and prevalence rates, adjusted to reflect the survey sampling design. Table 11 shows key variables according to school size. Tables 12 and 13 shows the findings from the recall bias substudy. Table 14 compares key characteristics of the “cohort” (students tracked over all four surveys) to the non-cohort students, while Table 15 shows the cumulative injury and work experiences of the cohort. Table 16 shows the multivariate analyses examining factors related to work-related injuries based on the first two (most complete) surveys. Finally, Table 17 provides the Inclusion Enrollment Report.

Figures 4 – 10 use pie charts to show the distributions of major job categories by survey period, grade level, and gender. Figures 11 – 13 are bar graphs showing the percent of jobs that involved any of 20 specific agricultural tasks. Figures 14 – 16 are bar graphs showing the percent of jobs

that involved any of nine potentially hazardous activities and/or conditions. Figures 17 – 25 use pie charts to show the distribution of where injuries occurred (at work, at school, other) by survey period, gender, grade level, race, and ethnicity. Figures 26 and 27 show the proportion of work-related injuries that were due to agricultural jobs. Figures 28 and 29 show a relative measure of work hours for all jobs and for two categories of agricultural jobs. Figures 30 and 31 shows the proportions of all jobs involved with agriculture. Figure 32 shows the proportion of students reporting jobs by age, gender, and survey period. Figure 34 shows the joint distribution of job categories and injury rates. Figure 35 shows the distributions of the maximum recall periods for each of the four surveys. Figure 36 compares selected variables between students who also participated in either arm of a concurrent intervention study.

First Year vs. Second Year Surveys

Before presenting any of the survey findings, some discussion is required as to the completeness and likely validity of surveys administered during the first year versus the second year. As will be discussed in the following sections, work experiences, injuries and asthma reported from the final two surveys (administered near the start and end of the second school year) are likely to be underestimates due in large part to a possible underreporting of these key outcomes. As will be described in Work Experiences, on the survey administered in the spring 2002 (covering the 2001-2002 school year), the proportion of students who reported any work experience was 61.7%; on the spring 2003 survey (covering the 2002-2003 school year), only 54.0% indicated any work experience. For the two surveys administered near the start of those school years (covering events of the previous summers), the percent of students who reported any work was 79.2% for summer 2001 and 70.2% for summer 2002. Although these surveys spanned a period of declining teen employment in the U.S., Minnesota teen employment data indicated that the teen (16-19 years of age) work force participation was 64.6% for 2001 and 63.7% for 2002, while the unemployment rate went from 7.5% to 9.5% during those same two years (Hillman 2004). While these statewide data reflect paid employment and are not strictly comparable to survey data in this study, these data suggest that the reported decline in the final surveys may only be partially explained by an actual decline in work.

The Minnesota Student Survey is a statewide school survey targeted to all 6th, 9th, and 12th grade students every three years (information available online at the Minnesota Coordinated School Health web site at <http://www.mnschoolhealth.com/resources.html?ac=data>). The two most recent surveys were administered in the spring 2001 and spring 2004, thus precisely bracketing the two school years included in this study. Those surveys indicated small declines in self-reported paid employment between the 2001 and 2004 surveys among schools in counties outside the seven county Minneapolis-St. Paul Metro area. For 9th grade students, the proportions reporting any paid employment during the school year went from 64.3% to 61.1% from 2001 to 2004. For 12th grade students, the proportion reporting any paid employment went from 79.2 % to 76.9%. The Minnesota Student Survey also asks about time spent doing “chores.” The proportion of 9th grade students who indicated any time spent with paid work and/or chores was 91.1% for 2001 and 90.2% for 2004. For 12th graders, the corresponding figures are 93.0% for 2001 and 92.1% for 2004. Thus, there is no corroborating evidence that such a steep decline in actual adolescent work experience (paid or unpaid) took place during the second year of this study.

As discussed below under Injuries, a similar decline in injuries reported during the second year surveys was also observed (Table 8). Overall injury rates for the first two surveys were 8.9% for summer 2001 and 8.7% for the 2001-2002 school year. Overall injury rates for the final two surveys were 4.8% (for both the summer 2002 and 2002-03 school years). Even more telling, the relative decreases in reported injury rates were similar regardless of whether the injury occurred at work, school, or other activities. Finally, self-reported ever-diagnosed asthma rates also declined on the final two surveys (11.1%, 11.0%, 9.7%, 9.1%, respectively for the four consecutive surveys).

Examination of the student questionnaire (Appendix A) will show that three items on the survey required by far the greatest number of follow-up responses given a “yes” answer to the initial item: these were work activities (Q19-27), injury/accident experience (Q28-38), both of which detailed up to four occurrences, and asthma questions (Q51-60). We suggest that as students (and teachers) became familiar with and increasingly weary of completing and administering the lengthy survey, an increasing portion of students didn’t complete the survey at all or simply

responded “no” to these items that they already knew required a lengthy series of follow-up items. This “survey fatigue”—as it might be called—was also suggested by anecdotal comments from teachers. We did not document verbal comments, but several written comments that came back with the final surveys are telling:

School A. “This is the 4th time that students have completed this survey. I am not sure what kind of data you will glean as some of them refused to take it and many were absent...”

School B. “Our kids decided that they didn’t want to fill out the surveys this last time....”

School C. “It is with apology that I need to inform you that [our] School will not be able to accommodate your desires for survey follow-up information....”

Thus, most of the following discussion on work, injuries, and asthma will focus on data from the two first year surveys administered near the start of the school year 2001-02 (for summer 2001 events) and near the end of the same school year (for events during the 2001-02 school year).

Demographics

This first (summer 2001) survey included the full complement of participating schools and the highest student participation rates (89.1%), yielding 13,869 completed surveys. The summer 2001 and school year 2001-02 surveys were intended for all 9th, 10th, and 11th grade students, while summer 2002 and 2002-03 school year surveys were intended for 10th, 11th, and 12th grade students. (One school included 12th grade students in the first year surveys and these responses are included in Table 8, although no conclusions should be drawn from the small and non-representative sample from a single school). There was an equal distribution of students in each of the three grades across all four of the surveys. In addition, each survey included an almost equal proportion of boys and girls. As anticipated, the overwhelming majority of students identified themselves as non-Hispanic ethnicity (93.8%) and White race (92.6%). Hispanics comprised 3.2%-3.4% of the participants. For both first year surveys with the highest participation, no race other than White exceeded 1.6% of the survey population.

The proportion of students who reported living on a farm or ranch was relatively consistent across all four surveys (13.4%-14.5%) and there was no evidence of a decline in farm residence over the short two year period. The two most common types of farming included row crops such as corn, soybeans, sugar beet (7.7%-8.7% of all students) and beef cattle (4.6%-5.1% of students). As shown in Table 11, the proportion of adolescents residing on a farm was significantly and inversely associated with school size. For the summer 2001 survey, for example, the proportion of students from large, medium, and small schools residing on a farm or ranch was 7.6%, 17.6%, and 25.2%, respectively.

The proportion of students who reported driving a motor vehicle increased with each survey, ranging from 69% to 85%. More boys reported driving than girls during the first year of the survey, but this difference was not evident during the second year. As expected, grade 9 students from the first survey reported the lowest percentage of driving (47%), while grade 11 and 12 students from the second year survey had the highest percentage (~90%). A consistent percentage of students across all four surveys reported always wearing a seatbelt (53%-55%).

With respect to tobacco use, a higher proportion of students reported ever having used chewing tobacco (13%-18%) than reported current smoking (12%-13%). A small but consistently higher percentage of girls reported smoking than boys at each survey, and smoking rates increased with grade, with 8%-10% of grade 9 smokers, and 17-18% of grade 12 smokers.

About 8% of students reported attended school during Summer 2001, while about 6% reported attending school during Summer 2002. Curiously, only 97% reported attending school during the school year; since the survey was only administered to students at school during school year, this figure should have been 100%.

Students reported roughly an hour more sleep on weeknights during the summer than during the school year (8.8 vs. 7.7, summer 2001 vs. following school year, respectively), but there was little difference for weekend nights (8.4 vs. 8.3).

Work Experiences – Rates

This survey allowed up to four jobs/chores to be listed for each survey. Given the broad definition of work used in this study (paid or unpaid, at home or away), it is not surprising that the vast majority of students reported at least one job during the survey period. Table 8 provides data on work experiences on a per person basis (e.g., the proportion of participants who indicated an agricultural job) while Table 9 focuses more on the characteristics of the total pool of jobs (e.g., of all the jobs reported by all students, the proportion of jobs that were agricultural).

A greater percent of youth reported work during the summer, with 79.2% of students reporting working during the summer 2001 and 70.2% working during summer 2002. During the school year, 61.7% reported at least one job during 2001-02, while only 54.0% reported a job for 2002-03. As previously discussed, the significant decline in reported work during both second year surveys is most likely explained by familiarity with, and weariness of, survey items – especially those items requiring many follow-up responses.

Girls reported a higher rate of working than boys at all survey periods. The smallest disparity was for Summer 2001, when 81.8% of girls worked compared to 77.5% of boys. During the first school year, 68.9% of girls reported work, while 56.5% of boys reported work.

The percent of working youth increased with grade (as well as age, Fig. 32) at all study periods. While 74% of grade 9 students worked during summer 2001, 88% of grade 11 students worked. During the first school year, 54% of 9th graders worked while 73% of 11th graders worked. Excluding the single school that surveyed a small number of seniors during the first year, the highest rate of work was found for Grade 11 girls during summer 2001 (90.6%).

While whites reported the highest percent of work at all time periods, the numbers of other racial groups were too small to draw valid conclusions. Non-Hispanics reported a higher rate of work than Hispanics, although as with race, the small numbers of Hispanics precludes any conclusions.

A higher proportion of youth living on farms reported working compared to their non-farm school mates at all study periods. During summer 2001, 88.5% of farm youth reported working compared to 78.4% of non-farm youth. An even larger difference was seen for the school year, with 76.8% of farm youth working and 60.4% of non-farm youth working during the 2001-02 school year. At summer 2002, 82.7% of farm youth worked, with 68.8% of non-farm youth working.

As with overall work, girls living on farms reported more work than boys on farms, although this difference (2-3%) was much smaller than the difference in work for non-farm girls and boys (5-18%). And as with overall work, the highest percent of employment among youth residing on farms was for grade 11 (93.1% for summer 2001).

This survey allowed up to four jobs to be identified. For summer 2001, about equal numbers of students reported a single job (23.1%) and two jobs (25.0%), while equal numbers reported three jobs (15%) and four jobs (14.5%). The proportion of students reporting a single job remained relatively constant over the four surveys (21.5-26.5%), while the proportions of those working more than one job generally declined with each survey.

Over half (55.9%) had at least one job in Personal Services, while 19.6% held at least one job working in a restaurant or fast food business. The next most common category of employment was in agricultural (15.2%) and retail (15.0%). The types of employment varied significantly by gender for most categories. For example, 65% of girls but only 48% of boys worked some job in personal services, while 10% of girls, but 20% of boys worked in agriculture.

Figures 4 through 10 show the relative distributions of the major job categories overall and for various subgroups. For the summer 2001 period, a total of 24,512 jobs were reported among the 13,869 participants (Figure 4a). Of this total, 49% of the jobs were in personal services, 14% in restaurant/fast jobs, 10% in retail, 10% in agriculture, 7% in construction/manufacturing/food processing, 5% in entertainment/recreation, 3% in professional/medical, and 1% in Other jobs.

For the school year 2001-02 (Figure 4b), 13,931 jobs were reported among the 10,945 participants. Distributions by major job categories were similar to the summer jobs. Personal services accounted for 43%, restaurant/fast food for 18%, retail for 15%, agriculture for 10%, construction/manufacturing for 5%, entertainment/recreation for 4%, professional/medical for 4%, and Other for 1%.

Distributions of jobs from the second year surveys (Figures 4c, 4d) were similar, with some declines in the portion of personal service jobs. Surprisingly, agricultural jobs consistently accounted for one out of ten jobs on each of the four surveys.

Substantial differences in the distribution of job categories were seen between boys and girls. Figure 5 shows the distribution of job categories by gender for the summer 2001 survey and the 2001-02 school year survey. Although many of the differences are significant due to the large numbers, the key differences are that more girls than boys are employed in personal service jobs, while more boys have jobs in construction/manufacturing as well as in agriculture. Job distributions for the second year surveys show a similar pattern (Figure 6).

Figures 7-10 show the distribution of major job categories for each survey period by grade level. For summer 2001 jobs, the major differences by grade are the declining proportion of personal service jobs (62%, 50%, 38%, for 9th, 10th, and 11th grades, respectively) and the increasing proportion of retail jobs (4%, 8%, 16%, respectively). The same trends were evident for the school year 2001-02. Personal service jobs accounted for 58%, 43%, and 32% of jobs for 9th, 10th, and 11th graders, respectively. Retail jobs again increased with grade, accounting for 5%, 13%, and 22%, respectively. Second year surveys (Figures 9-10) suggested that those trends did not continue with 12th graders, who had job distributions very similar to 11th graders during those time periods.

Question 26 on the student survey (Appendix A) inquired about 20 specific agricultural tasks that may have been associated with one or more of their jobs. The proportion of all jobs involving these tasks is shown in Figure 11 for each survey period. The portion of jobs involving these tasks ranged from about 1% to about 12%. The most frequent tasks, associated with between 8%

and 12% of jobs at all or most survey periods were “drive tractor/combine”, “repair/maintain machinery”, “hoe, picks rocks, cut weeds”, “building cleaning” and “landscaping.”

Figures 12 and 13 show jobs associated with these same tasks according to gender. The scale on both figures is the same. The large differences for virtually every category are readily apparent from these figures. For boys, the portion of jobs involving these tasks ranged from about 2.5% to about 25%, with over half the tasks above 10%. For girls, the portion of jobs involving these tasks ranged from about 1% to about 6-7%, with only two task categories above 5% (“hoe, pick rocks, cut weeds” and “building cleaning”).

The survey also inquired about nine potentially hazardous activities not limited to agriculture (working around hot surfaces, using chemicals, operating power tools, etc.). Figure 14 shows the proportion of all jobs in which these activities were noted. These hazardous activities or situations were associated with about 10% to 40% of jobs. The most frequent hazards were “lifting/bending/twisting” (about 40% of jobs), “operating non-power hand tools” (about 30%), and working around hot surfaces (about 25%). The least frequent hazards were working with animals (10%) and “climbing/working from heights” (about 12-15%).

Figures 15 and 16 show the same nine hazardous conditions according to gender. Again, the proportion of jobs associated with hazards was much higher for boys and than girls for almost every category. The proportion of jobs associated with these hazards among boys ranged from about 15% to almost 55%, with five of the nine categories at or above 30%. For girls, the range was from about 8% to almost 40%, with six of nine hazards near or under about 10%. The most frequent hazard for both boys and girls was “lifting/bending/twisting”.

Work Experience – Hours

As discussed further under study limitations, this survey did not ascertain the usual standard measure of work hours (i.e., weekly work hours). Instead, this survey inquired about “typical” daily work hours (in parallel with other questions about typical daily hours spent in commuting, sleep, recreation, homework, etc.). While the hours reported cannot be compared to any other

published report based on weekly work hours, comparisons among subgroups within this dataset may provide useful insights. To make the fewest assumptions possible, the reported “typical” hours were added for each job (separately for weekdays and weekend days) and divided by the number of jobs. This metric should be viewed as a comparative index of work hours and not as a literal measure of average daily since it cannot be known how many days/week those “typical” hours would apply.

For total work hours (all jobs), there was a significant increasing trend with grade level (i.e., age) for both weekday and weekend hours at all four survey periods. In addition, weekday hours were slightly, but consistently higher than weekend hours for both summer survey periods, while weekend hours were sharply higher than weekday hours for the two school-year survey periods. There were small but significant difference in work hours by gender. Girls had slightly higher weekend hours for both summer periods, while boys had slightly higher weekday hours for three of the four surveys. For non-agricultural jobs, small but significant increases in mean work hours were found for 10th and 11th grade students when comparing summer-to-summer and school year-to-school year over the two year period (these grades participated in all four surveys). As previously noted, longitudinal trends must be viewed very cautiously in this study due to sharp declines in participation and a likely underreporting of work on the second year surveys.

Work hours were also examined for farm work, agribusiness work, and non-agricultural work. The work hours and trends for non-agricultural jobs, as expected, were virtually identical to total jobs, since the vast majority of jobs were non-agricultural. A slightly different pattern was found for agricultural jobs. The varying ratios for weekday/weekend hours for summers and school years were comparable to non-agricultural jobs. However, there were no consistent trends in work hours by grade level for either farm jobs or agribusiness jobs although in almost all cases, those in the highest grade level at each survey had the highest average weekday hours and weekend hours. With respect to gender, boys had significantly higher weekday hours and weekend hours than girls at all survey periods. Work hours were also examined on the basis of farm residence. As might be anticipated, farm residents reported a greater number of work hours than non-farm residents in agricultural jobs, for weekday and weekend hours and for all survey

periods. For non-agricultural jobs, the reverse pattern was found: farm residents consistently reported fewer weekday and weekend hours than non-farm residents for non-agricultural jobs.

It was hypothesized at the outset of this study that the significant decline in the number of family farms and the increase in corporate or partnership farms that occurred in Minnesota into the mid-1990s may be reflected in employment shifts in rural youth. However, that trend in farm types did not persist over the time frame of this study. Indeed, both the number of family farms, and the proportion of total farms that were family owned *increased* by several percentage points between 1997 and 2002 (2002 Census of Agriculture). Consistent with these more recent farm census data, no shift in agricultural work was evident from this study. The proportion of reported jobs involving agriculture was remarkably constant at about 10% across all four surveys. And among agricultural jobs, there was no significant variation in the proportion of jobs related to farms (80%) vs. agribusiness. Comparing farm hours to agribusiness hours, agribusiness work hours tended to be higher for both weekday and weekend hours across all surveys, although these differences reached statistical significance only on the first survey. On the highly uncertain assumption that work hours were not biased on the second year surveys, we compared mean work hours for 10th and 11th grade students for various job categories between the two summer periods and between the two school year periods. For agricultural jobs, no significant differences in mean weekday or weekend work hours were found between the two summer surveys or between the two school year surveys.

Injury Findings

Based of the definition of injury used in this study, the proportion of students reporting at least one injury (at work, school, or other location) was 8.9% during the summer 2001 and 8.7% for the following 2001-02 school year. A much lower rate of injury (4.8%) was reported for each of the following two survey periods (summer 2002, school year 2002-03), but there was significant evidence that the decrease in reported rates on the final two surveys represent a decreasing willingness to complete the questionnaire rather than an actual decline in rates.

Work-related injuries comprised only a small portion of total injuries (Figure 17). Of the total injuries reported during the summer 2001, about one in five (22%) were work related, about 7% were school related, and 71% occurred in “other” locations, outside of work and school (details not ascertained in this study, but presumably due to recreational activities, hobbies, auto accidents, etc). During the 2001-2002 school year, 13% of the injuries were work related, 25% were school-related, and 62% occurred outside of work or school. These proportions did not vary significantly by gender (Figures 18, 19), but they did vary by grade level (Figures 20-23). There was a consistent and statistically significant increase in the proportion of injuries related to work with increasing grade level. For summer 2001, the proportion of injuries related to work was 13%, 18%, and 37%, for 9th, 10th, and 11th graders, respectively ($\chi^2_{\text{trend}}=93.0$ $p<0.0001$). For school year 2001-02, the proportion of injuries related to work was 7%, 13%, and 22% for 9th, 10th, and 11th graders, respectively ($\chi^2_{\text{trend}}=43.8$, $p<0.0001$). Similar significant trends were seen for the second year surveys, despite the dramatic decline in reported injuries of all types (Figures 22, 23).

Figures 24 shows injury distributions by race (white vs. non-white) and Figure 25 shows the distributions by ethnicity (Hispanic vs. non-Hispanic). The small numbers of non-White and non-Hispanic participants limit the conclusions that can be drawn. For the two summer period surveys, no significant differences were found in the distribution of injuries (work, school, other) between Whites and non-Whites. However, for the two school year surveys, the distributions were not equal, although no generalization can be made about work-related injuries. With respect to ethnicity (Figure 25), the numbers for Hispanics are even smaller and more difficult to interpret. Except for the final survey in which a marginally significant difference was found ($p=0.044$) based only on 24 Hispanic injuries, no differences in injury distributions were found.

The proportion of students who reported any work-related injury was 1.9% for summer 2001 and 1.2% for the following school year. Among working students only, the rate of work-related injury was 2.4% for summer 2001 and 1.6% for the following school year.

Agricultural work injuries represented a small but significant proportion of total work injuries. During the summer 2001, agricultural jobs were associated with about one of five (19.3%) of

work-related injuries (Figure 26). Over 90% of these agricultural injuries were related to work on farms, while 10% were related to work for an agribusiness. For the following 2001-02 school year, agricultural injuries comprised about 15% of work-related injuries, and again most of these agricultural injuries (73%) were related to farm work rather agribusiness.

At least one agricultural work injury was reported by 1.6% of working students during the summer 2001 and by 0.8% of working students during the following school year. For summer 2001, agricultural work injuries were significantly higher among students residing on a farm (6.8%) compared to students not residing on a farm (0.7%). The increased agricultural injury rate associated with farm residence was consistent across all four surveys.

Recall Bias Findings

As described in Methods, a sample of schools and grades (N=760 students) were selected to participate in an abbreviated mid-year (“recall bias”) survey. Injury and work experiences for the months of September-December from this survey would then be compared to the student responses from the following Spring survey for events from the same time frame. Unfortunately, only 50% of the original targeted sample (N=383 students) participated and/or could be definitively matched between the two surveys, limiting any conclusions that can be drawn. Furthermore, the low rate of injuries in this population means that there were very few reported injuries that could be used for assessing recall and this assessment was only able to examine overall injuries regardless of where the injury occurred (work, school, other).

As shown in Table 13, 350 of 383 students (92%) reported the same injury experience on both surveys for the September-December time frame. This apparent high level of agreement is due, however, to the large proportion of students who reported no injuries on both surveys: 343 students reported no injuries during September-December on both surveys, while seven students reported an injury on both surveys. Among the students with discordant responses, five students reported an injury on the Spring survey, but not the midyear survey, while 28 students reported an injury on the midyear survey, but not the Spring Survey. A better measure of agreement than

the overall agreement would be the Kappa statistic, which represents a chance adjusted measure of agreement. For injury, the Kappa was a relatively poor 0.26. Using the Midyear survey as the “gold standard”, the sensitivity of the Spring Survey was a very poor 0.20 while the specificity was a very high 0.99.

In Table 14, we further examine recall bias for injuries by reporting the rates of injury for recall participants who completed both surveys. We also report injury rates from the two Spring surveys partitioned into two time periods: September-December (the more distant period) and January-May (actually, January to the time of the survey). Rates were examined for all students and by gender.

Several items are notable in this table. The first two rows show the responses of the 385 students for whom we had matching questionnaires from both the Midyear Survey and the subsequent Spring Survey. At the Midyear Survey, 9.1% of the students reported an injury during the previous four months (September-December), while only 3.1% of these same students reported an injury during that period when completing the subsequent Spring survey, roughly three months later. This differential was greater for boys (four-fold) than for girls (two-fold). While these data demonstrate a considerable underreporting of injuries on the Spring Survey, other data described in this section are not consistent with a true recall bias (i.e., failure to recall an injury more distant in time).

The bottom two rows of Table 14 show injury rates from the Spring 2003 survey as well as the previous (Spring 2002) spring survey. Based on the Spring 2003 survey, the percent of non-recall-participant students with any injury during September-December was 2.8%, while the percent of students with any injury during January-May was also 2.8%. For boys, the injury rates for the two time periods were 2.8% and 2.4%, while for girls the injury rates were 3.0% and 3.3%, respectively for September-December and January-May.

From the Spring 2002 survey, we found the reported injury rate for the previous September-December period to be 5.8%, while the reported injury rate for January-May period was 5.5%. For boys, the respective rates were 6.2% and 5.7% and for girls the rates were 5.5% and 5.4%.

While these all-cause injury rates have not been adjusted for types of work, participation in school or recreational activities or other factors that could potentially influence injury risk by semester, these data provide no evidence of higher reported injury rates for the more recent time period that would be expected if a significant recall or “telescoping” bias were present.

It was hypothesized based on the literature that injury recall might be better for potentially more severe injuries. This was examined by looking at agreement of recall participants for injuries that required treatment by a health care provider and injuries that involved any level of restricted activity. We did not find, however, a greater level of agreement or higher sensitivity when limiting the comparison to potentially more severe injuries. For injuries that required any treatment by a health care provider, the Kappa was 0.22, the sensitivity was 0.24, and the specificity was 0.96. For injuries that involved any level of restriction of normal activities, the Kappa was 0.25, the sensitivity was 0.24 and the specificity was 0.97. This finding is also inconsistent with a true recall bias for injury.

Agreement with respect to any reported work experience during the period September-December showed a different pattern of agreement than for injury. Some 268 of 370 students (72%) reported the same response for working on both surveys: 153 said they did work, while 115 said they did not work for that period on both surveys. Fifteen students indicated they had worked on the Spring survey but not on the Midyear Survey, while 87 students indicated they worked on Midyear survey but not on the Spring Survey. While the overall agreement was lower for work than injury, the chance-corrected Kappa statistic was higher for work ($k=0.46$). Again, using the Midyear Survey as the gold standard, the sensitivity of the Spring Survey was 0.64, while the specificity was 0.89.

Recall was also examined with respect to reported “typical” weekday and weekend work hours for both agricultural jobs and for all jobs. For this analysis, a weighted average of weekday and weekend hours was determined (an approximation of weekly hours). For agricultural jobs, students reported fewer hours on the Spring Survey than on the Midyear Survey (0.79 vs. 0.31 hours, $p=0.005$), while there was no significant difference in work hours for all jobs (15.66 vs.

15.49 hours, $p=0.82$). When the analysis was restricted to those students who reported working on both surveys, virtually the same pattern was found. For the period September-December, students reported fewer agricultural work hours on the Spring Survey than the Midyear Survey (1.07 vs. 0.60 hours, $p=0.04$), but no significant differences in work hours for all jobs (17.30 vs. 16.45 hours, $p=0.48$).

These data suggest that on the Spring Survey students were underreporting the hours of agricultural work they did the previous fall semester, but were not apparently underreporting their overall work hours.

Cohort Findings

As previously described, this study was originally designed with the expectation of following a large and representative cohort of rural adolescents over two complete years (two summers and two school years). Consequently, only 9th, 10th, and 11th grade students were surveyed (twice) during the first year and only 10th, 11th, and 12th grade students in these same schools were surveyed during the second year. However, as previously described under Methods, due to the fact that we were not able to collect and retain names of students and that there was a significant loss of schools and participation, we were only able to identify 5,618 students for whom we had all four surveys. For simplicity, this group is referred to in this report as the “cohort.”

Two concerns arising from the relatively small number of students in the cohort are the increased uncertainty of the findings and, more importantly, the representativeness of the cohort in relation to the original selected population. Additional concerns are the reduced participation rates in the final two surveys and, as previously discussed above at some length, the rather dramatic decline in reported work and injuries among those still participating in the final two surveys. Thus, in addition to potential biases and increased variability from low participation, there is a strong likelihood that injuries, work, and asthma are underreported in the final two surveys, leading to underestimates of the cumulative incidence of these outcomes.

The total study population, as previously described in the methods, was a stratified random sample of rural schools drawing from four agricultural regions and three school sizes. With appropriate weighting of results, findings can be generalized to rural Minnesota adolescents in public schools. To address the representativeness of the cohort, cohort students were compared to non-cohort students for several key variables for each of the four surveys. Table 14 shows the cohort vs. non-cohort comparisons for the first two most complete surveys that reflect the original sampling strategy to the greatest degree (comparisons for the second two surveys showed a similar pattern). As can be seen from Table 14, there were statistically significant differences between the cohort and non-cohort on both first year surveys for six categorical variables (gender, grade, any work, farm residence, grades, and smoking). For two variables (any injury, seat belt use), there was a significant difference between the groups on only one of the surveys. There was no difference on either survey between the groups with respect to ever having been diagnosed with asthma. While some of the differences between the groups were modest (reaching statistical significance due to the sample size), several differences were notable. In particular, a higher proportion of the cohort (17.1-17.3%) resided on farms than the non-cohort (11-12.6%), while a much smaller proportion of the cohort were smokers (8.1-9.6% vs. 15.9-17.5%). Cohort students also received higher grades.

In addition to the categorical variables shown in Table 14, the continuous variables of age, weekday sleep hours, weekend sleep hours, weekday work hours, and weekend work hours were also compared. Although statistically significant differences between cohort and non-cohort students were found for four out of the five variables for the first two surveys, the differences were small in magnitude. For example, weekday sleep hours were slightly higher for the cohort during the summer (8.9 vs. 8.8, $p < 0.0001$) as well as during the school year (7.7 vs. 7.6, $p = 0.005$). In general, the cohort students were slightly younger, had slightly more sleep hours, and slightly more work hours than the non-cohort students.

It should also be noted here that as the participation dropped in successive surveys, the cohort subgroup necessarily made up an increasingly large portion of the study population still participating at each successive survey. The cohort comprised 40.5%, 51.3%, 61.9%, and 72.0% of the study participants on the four successive surveys, respectively.

For these and other reasons discussed previously, we decided to examine only the cumulative incidence of key variables using the cohort, rather than conduct a multivariate analysis using a small and perhaps unrepresentative subset of the data. For the multivariate analyses, we used logistic regression to examine risk factors and covariates associated with work-related injuries based on the two initial most complete and representative surveys.

Table 15 summarizes the cumulative injury and work experiences of the cohort over the two consecutive years covered by the four surveys. Not surprisingly, over nine out of ten students (92.8%) reported having worked at some point during that interval. The proportion of girls working (94.8%) was slightly but significantly higher than boys working (90.8%) and there was a significantly increasing trend for work with increasing grade level with 89.0%, 92.7%, and 97.3% of students working for 9th, 10th, and 11th graders, respectively ($p < 0.0001$).

A much smaller proportion of students (37.6%) reported any work during each of the four survey periods. A significantly higher proportion of girls than boys reported working during all four survey periods (44.6% vs. 30.6%, $p < 0.0001$) and there was a significant increasing trend for working all four periods with grade level, with almost half (48.1%) of 11th grade students working during all periods.

Over one in four students (25.4%) reported agricultural work (either for farm or agribusiness) on at least one of the four surveys, while 4.5% reported some agricultural work during each of the four periods. About twice as many boys as girls reported any agricultural work. Some 33.7% of boys and 17.3% of girls ($p < 0.0001$) reported agricultural work on at least one survey, and 6.4% of boys and 2.7% of girls ($p < 0.0001$) reported some agricultural work on each survey. In contrast to overall work, which showed a significant increase with grade level, there was no apparent trend with grade level for agricultural work in this subgroup.

Almost one in five students (17.9%) in this subgroup reported at least one injury (any type) during the two-year interval. There was no significant difference between boys (18.3%) and girls

(17.5%), but 9th graders reported a higher rate (20.3%) than 10th or 11th graders (16.8% and 16.7%, respectively).

Injuries were further examined by type (at work, school, other). At least one work-related injury was reported by 4.6% of those who reported working. A significantly higher proportion of boys reported any work-related injury than girls (5.4% vs. 3.9%, $p=0.01$) and injury rates increased significantly with grade level (3.9%, 4.3%, and 5.6% for 9th, 10th, and 11th graders, respectively, $p=0.03$).

The proportion of the cohort reporting at least one school injury was 4.5%, similar to the rate of work injury. The rate among boys (4.8%) was not significantly higher than the rate for girls (4.2%). In contrast to overall work injuries, there was a significant decreasing trend for school injuries with grade level, with the highest rate (5.6%) among 9th graders and the lowest rate among 11th graders (3.6%).

Other injuries (those not occurring at work or school; details were not ascertained) were the most common, with 12.5% of the cohort reporting at least one injury during the two years. There was no difference in the reported rate of other injuries between boys (12.4%) and girls (12.6%). As with school injuries, there was a decreasing trend with grade level, with rates of 15.0%, 11.6%, and 10.8% respectively for 9th, 10th, and 11th grades ($\chi^2_{\text{trend}}=15.2$, $p<0.0001$).

Finally, we looked at the incidence of any agricultural work injury among those who had reported any work. About 2.5% of those working reported at least one injury associated with an agricultural job activity. The rate was significantly higher for boys than for girls (3.9% vs. 1.1%, $p<0.0001$; unadjusted odds ratio = 3.56, 95% CI=2.35-5.38). Rates were not consistent across grade level, but there was no significant trend.

Further analyses of the cohort data are pending completion of a doctoral thesis and will be subsequently submitted for publication.

Multivariate Findings for Work-Related Injury from Initial Two Surveys

As noted above, due to a variety of factors potentially affecting the analyses and interpretation of the “cohort” data (the 5,618 students from whom all four surveys were available), we focused our multivariate analyses in this report on the more complete and representative data from the first two surveys to further analyze factors associated with work-related injuries. In this analysis, we used multiple logistic regression to examine a variety of factors on the risk of work-related injury for each of the first two surveys. . The dependent variable was the reporting of an injury that occurred at work. The independent variables included in the model were: age (continuous), sex, current smoking status, having an agricultural job, residence on a farm, race (non-White vs. White), overweight (BMI $\geq 85^{\text{th}}$ percentile vs. under), weekly sleep hours (<60 vs. ≥ 60), and a relative index of hours worked. A true measure of work hours (i.e., exposure) could not be obtained since the survey did not use the customary measure of work hours/week, but instead asked about “typical” hours worked per day (separately for weekdays and weekend days). Using this response, a weighted average of daily work hours was determined and then multiplied by the number of days between the start and end date for the job. This index was then divided into tertiles, with the lowest third (reference category) compared to the middle and upper tertiles. While this index cannot be interpreted as a measure of person-hours of exposure, it should provide a relative scale to account for broad categories of work time and is only meaningful within this data set.

School size and agricultural region – the two factors used in stratified sample selection – were not significant when included in the model and did not materially affect the other factors; therefore, these factors were excluded from the model.

These findings of this analysis are shown in Table 16. For the summer 2001 survey data, the risk of work-related injuries was significantly associated with male gender (OR=1.61), current smoking (OR=1.68), having an agricultural job (OR=1.89), residing on a farm (OR=1.37), being overweight (OR=1.24), less than 60 hours sleep/week (1.42), and increased work hours (highest tertile, OR=3.56, middle tertile OR=2.03). No significant association was found for age (OR=1.02) or race (OR=0.87).

The risk of work-related injury during the subsequent 2001-02 school year was significantly associated with increasing age (OR=1.25), current smoking (2.38), agricultural work (OR=2.06), being overweight (OR=1.51), and increased work hours (highest tertile OR=2.49, middle tertile OR=1.42). No association was found for gender (OR=0.88), farm residence (OR=1.21), race (OR=1.42), or sleep hours (OR=0.95).

Factors that were significantly associated with an increased risk of work injury for both survey periods included current smoking, agricultural work, elevated BMI, and increased work hours. Farm residence was a significantly elevated risk for summer (OR=1.37, 95%CI=1.05-1.79); while this factor was not significantly elevated for the school year period (OR=1.21, 95%CI=0.83-1.76), it was consistent in direction and magnitude. The only factor not associated with work injury risk on either survey was race (non-White vs. White); however, the non-White category included five different racial groups, and combined, only represented about 5% of study participants on each survey.

Asthma Prevalence and Risk Factors

Table 8 shows the overall crude responses to the questions in the asthma section of the survey. Adjusted prevalence rates (based on the stratified sampling design and generalizable to rural Minnesota adolescents) are shown in Table 9.

The prevalence of asthma and wheezing, along with risk factors for these conditions, for the first survey were published in the *Journal of Asthma* (Brunner, Lindgren et al. 2005) and are attached in Appendix J: “Asthma Among Rural Minnesota Adolescents”. Among the students in grades 9-11 who completed the survey in fall of 2001, 12.6% reported ever having been diagnosed with asthma and 9.2% reported that they currently had asthma. The corresponding sample-adjusted prevalence rates were 12.7% for ever-diagnosed asthma, and 9.4% for current asthma.

A major finding on this analysis was that students living on farms reported significantly less wheezing and asthma than their rural non-farm counterparts (wheezing OR=0.83, 95% CI=0.71-

0.97; ever-diagnosed asthma: OR=0.78, 95% CI=0.65-0.94; current asthma: OR=0.77, 95% CI=0.63-0.94).

Key findings from the paper:

- We found no difference in asthma or wheezing by type of farm (livestock versus crop-only).
- Overweight students were more likely to report wheezing and asthma.
- Students who were current smokers were more likely to report wheezing and asthma.
- Students exposed to smoking at home were more likely to report wheezing but just as likely to report asthma as those not exposed to smoking at home.
- Asthma rates for girls increased by age (14-17) while the rates for boys decreased by age. The increase for girls could be largely explained by simultaneous increases in smoking rates.

Regional differences in asthma prevalence

Asthma prevalence varied by agricultural region (based on data from the Fall 2001 survey). These differences persisted after adjusting for age, sex, farm residence, body mass index, current smoking and household smoking. Agricultural regions were defined by the predominant type of farming taking place in the counties making up the region; however, region is not necessarily a surrogate for specific farming exposures since not all students in each region lived on farms. Unmeasured differences by region could include access to care and diagnostic practices.

Work-related asthma

The percentage of students with current asthma who reported that their asthma was work-related ranged from 18.5% – 24.3% over the four surveys.

To isolate the potential effect of farm work on asthma and wheezing, we compared students who did not live on farms whose jobs included farm work with non-farm students who did not work on farms. There was no difference in rates of wheezing and asthma between these two groups. However, there was a significantly higher rate of wheezing among non-farm boys doing farm work than among non-farm boys whose work did not include farm work. (See Appendix J for more details.)

Asthma Incidence Rates

Table 8. shows the crude prevalence rates for lifetime asthma (“Has a doctor ever told you that you have asthma?”) and current asthma (“Do you still have asthma?”) over the period of the study. The prevalence of ever-diagnosed asthma decreased through the four time points despite our expectation that this rate would increase as new cases were diagnosed. The prevalence of current asthma also decreased, however, decreases in current asthma could indicate students who had been diagnosed in the past, but whose asthma had since “gone away”—not uncommon in boys.

Because of the decrease in lifetime asthma prevalence, we were unable to calculate incidence rates for asthma. We speculate that students either did not read the doctor diagnosis question carefully, answering about current asthma rather than lifetime diagnosis, or they answered “No” to doctor diagnosis so they could skip the rest of the survey.

School Notifications

All 41 participating schools were provided interim study results on two occasions during the course of this study. These four-page reports were customized for each school. Schools received summaries of the key findings for their own students, as well as the findings for all schools combined. Sample reports are shown in Appendix H and I.

Conclusions

A major purpose of this study was to develop and implement surveillance methods to more broadly characterize the work, injury, and asthma experiences of rural Minnesota adolescents. This study was largely successful in fulfilling that objective, although a number of factors limit the usefulness and generalizability of a portion of the findings as well as the methods.

Methodologically, this study had a number of strengths that enhance the usefulness of the findings. The sample size and stratified random sample selection and - on the first two surveys- high participation rates, allow the findings to be generalized to other rural Minnesota adolescents. And, as shown in other research, the use of in-school surveys, in addition to reducing costs compared to household surveys, is likely to produce a more accurate reporting of certain characteristics such as alcohol consumption. The use of a passive consent process also contributed to the (initially) high participation.

The major limitations of this study fall into two basic categories: (1) nonresponse: the fall off in participation at both the school level and student level, and the somewhat related factor of remaining participants apparently marking “no” to multipart questions rather than skipping the question entirely; and (2) the survey instrument itself. Each of these factors has been noted and discussed in appropriate parts of this report, but are summarized again here.

Nonresponse and Participation

In this multi-survey study, nonresponse bias would have the most potential impact on those outcomes involving a longitudinal component (cohort analysis and shifts in work hours) or focused on the second year data (recall bias analysis). We experienced two forms of nonresponse: (a) the usual absences, refusals, and/or skipped items; and (b) students who apparently participated, but who used the “no” or “none” response to effectively skip questions with lengthy follow-up items.

Student rosters prepared by the schools just prior to the start of the Fall 2001-2002 school year showed 15,568 students were expected to enroll in the 41 participating schools. As per the

original study design, data on student movement (e.g., absenteeism, transfers, drop outs) during the study was requested from each school to follow-up with individual students as well as compare similarities and differences between schools. The completeness of this information from all schools and at each test period was not consistent and, along with the absence of personal identifying information, limits the evaluation of potential nonresponse bias. While some schools could provide explanations for 100% of the non-participants, other schools were not able to provide explanations for any of their non-participants. Of the reasons for non-participation that were provided, the two most common were absences (25% of total missing) and “no longer enrolled” as of the survey date (18% of missing).

Participation was high for almost all schools at the initial (Fall 2001) survey, ranging from 77% to 100%. Of the 41 schools, 31 had participation rates over 90% and the overall participation rate was 89.1% (Table 4). Participation in subsequent surveys declined. As noted previously, several whole schools dropped out of the study at subsequent time points. In addition to these losses, student participation rates also declined among the remaining participating schools. While precise participation rates are not known for subsequent surveys (since the number of eligibles is not accurately known), an approximate estimate can be made based on the Fall school rosters and accounting for the schools that withdrew from the study. We estimate the following student participation rates among schools that remained in the study: Spring 2002 Survey = 79%, Fall 2002 Survey = 78%, and Spring 2003 Survey = 68%. As shown in Table 8, the total number of student surveys completed at each survey was as follows: Fall 2001 = 13,869; Spring 2002 = 10,945; Fall 2002 = 9,073; and Spring 2003 = 7,802.

As discussed in previous sections, work experiences, injuries and asthma reported from the final two surveys (administered near the start and end of the second school year) are likely to be underestimates due in large part to a possible underreporting of these key outcomes. As described in Work Experiences, on the survey administered in the spring 2002 (covering the 2001-2002 school year), the proportion of students who reported any work experience was 61.7%; on the spring 2003 survey (covering the 2002-2003 school year), only 54.0% indicated any work experience. For the two surveys administered near the start of those school years (covering events of the previous summers), the percent of students who reported any work was

79.2% for summer 2001 and 70.2% for summer 2002. Although these surveys spanned a period of declining teen employment in the U.S., Minnesota teen employment data indicated that the teen (16-19 years of age) work force participation was 64.6% for 2001 and 63.7% for 2002, while the unemployment rate went from 7.5% to 9.5% during those same two years (Hillman 2004). While these statewide data reflect paid employment and are not strictly comparable to survey data in this study, these data suggest that the reported decline in the final surveys may only be partially explained by an actual decline in work.

The Minnesota Student Survey is a statewide school survey targeted to all 6th, 9th, and 12th grade students every three years (information available online at the Minnesota Coordinated School Health web site at <http://www.mnschoolhealth.com/resources.html?ac=data>). The two most recent surveys were administered in the spring 2001 and spring 2004, thus precisely bracketing the two school years included in this study. Those surveys indicated small declines in self-reported paid employment between the 2001 and 2004 surveys among schools in counties outside the seven county Minneapolis-St. Paul Metro area. For 9th grade students, the proportions reporting any paid employment during the school year went from 64.3% to 61.1% from 2001 to 2004. For 12th grade students, the proportion reporting any paid employment went from 79.2 % to 76.9%. The Minnesota Student Survey also asks about time spent doing “chores.” The proportion of 9th grade students who indicated any time spent with paid work and/or chores was 91.1% for 2001 and 90.2% for 2004. For 12th graders, the corresponding figures are 93.0% for 2001 and 92.1% for 2004. Thus, there is no corroborating evidence that such a steep decline in actual adolescent work experience (paid or unpaid) took place during the second year of this study.

As discussed previously under Injuries, a similar decline in injuries reported during the second year surveys was also observed (Table 8). Overall injury rates for the first two surveys were 8.9% for summer 2001 and 8.7% for the 2001-2002 school year. Overall injury rates for the final two surveys were 4.8% (for both the summer 2002 and 2002-03 school years). Even more telling, the relative decreases in reported injury rates were similar regardless of whether the injury occurred at work, school, or other activities. Finally, self-reported ever-diagnosed asthma

rates also declined on the final two surveys (11.1%, 11.0%, 9.7%, 9.1%, respectively for the four consecutive surveys).

Examination of the student questionnaire (Appendix A) will show that three items on the survey required by far the greatest number of follow-up responses given a “yes” answer to the initial item: these were work activities (Q19-27), injury/accident experience (Q28-38), both of which detailed up to four occurrences, and asthma questions (Q51-60). We suggest that as students (and teachers) became familiar with and increasingly weary of completing and administering the lengthy survey, an increasing portion of students didn’t complete the survey or in effect chose not to respond by simply checking “no” to those items that they already knew required a lengthy series of follow-up items. This “survey fatigue”—as it might be called—was also suggested by anecdotal comments from teachers. We did not document verbal comments, but several written comments that came back with the final surveys are telling:

School A. “This is the 4th time that students have completed this survey. I am not sure what kind of data you will glean as some of them refused to take it and many were absent...”

School B. “Our kids decided that they didn’t want to fill out the surveys this last time....”

School C. “It is with apology that I need to inform you that [our] School will not be able to accommodate your desires for survey follow-up information....”

Nonparticipation, as well as the lack of personal identifying information, also effectively limited the participation rate for the recall bias evaluation. The original targeted sample included 760 students from eight schools. A total of 569 (72%) surveys were returned (Table 5). However, the number of Recall and Spring surveys that could be matched and used for analysis was 385 (61% of the returned recall questionnaires; 50% of the original eligible population). In addition to the low participation, the recall bias survey results were dependent on responses for the final study survey, which as described above, was characterized by likely under-reporting of both work and injuries, this yielding a lower level of self-agreement.

The nonresponse also impacted the usefulness of a cohort analysis. Only 40% of the initial study participants could be followed over the four surveys. However, not only was the sample size

reduced, increasing the uncertainty of any findings, this group clearly differed in a number of key characteristics from the other participants, thus impacting the generalizability of any findings. The underreporting on the final surveys would also be applicable to the cohort group. Consequently multivariate analyses were performed on the two initial highest participation surveys.

Questionnaire Design

The broad range of items included on the questionnaire was both a strength and a weakness of this surveillance study. The questionnaire included 60 numbered items; however, many items had multiple follow-up subparts. In the most extreme case, if a participant had had four jobs, four injuries, and asthma, they were asked to read and check approximately 240 responses.

The very broad spectrum of items included on the questionnaire contributes to the usefulness of the findings. Injuries were ascertained and characterized according to where they occurred (work, school, other locations), the nature of the injury, and the consequences (disabling problems, school missed, etc.). Work histories included several checklists of items that may confer a risk of injury for either agricultural (e.g., driving a tractor) or non-agricultural work (e.g., working around hot surfaces). In addition, a variety of other characteristics were ascertained that may be associated with injury or asthma risk but that are also useful in assessing the general health status of rural youth. These include such factors as: farm residence; amount of sleep; time spent in recreation, organized sports, and commuting; driving a vehicle; seat belt use; tobacco use; alcohol use; secondary smoke exposure; and height and weight. The injury, work, and personal characteristics would clearly be helpful in developing and prioritizing intervention and health promotion activities.

The length and/or the frequency of the questionnaire, however, also proved problematic. While participation and completeness of responses were high initially, by about the third time students had seen the same survey, there was a reduced willingness to complete the survey, or if “completed”, to in effect skip over items by simply checking “no” to the initial multipart question. The sharp drop in participation on the final two surveys and the apparent underreporting of key outcomes limit the usefulness of those surveys and outcomes that

depended on the final surveys (such as longitudinal trends). While schools were compensated for their participation, individual teachers and students were not offered any specific incentives. Without such incentives, it does not appear feasible to survey the same adolescents four times over two successive school years with such a lengthy questionnaire

Another limitation of the questionnaire is that several items were not asked in a standardized format or sequence, or proved difficult to link to other items for purposes of analysis. In particular, the work history questions did not include the number of hours working *per week*; instead the survey asked, “What is the average number of hours you worked on a TYPICAL WEEKDAY OR NIGHT in [months of survey period]. The student then filled in a bubble with numbers from one to sixteen. A second identical question asked about typical work hours for weekend days or nights. The hours for up to four jobs could be listed. While this question paralleled the format of other questions pertaining to “typical” daily time factors such as homework time, commuting time, participation in sports and recreational activities, and sleep, it was not possible to derive from this the *weekly* work hours.

While job start and end dates were also ascertained, job dates for many jobs were overlapping. Regardless of overlapping dates, it was usually not possible to ascertain, for example, whether a student who marked 4 hours for a “typical” weekday, meant 4 hours/day each weekday (total weekly hours = 20) or 4 hours for the one day/week that they worked (weekly hours = 4). The problem was further confused when multiple jobs (and multiple hours) were listed (the average number of jobs listed for students working was 2.2 for the initial survey). Once again it could not be known how many days a week applied to each job, and whether the jobs were concurrent or sequential.

The limitations on work hours preclude characterization of the actual weekly hours rural Minnesota students in this study were working and also any comparison to other surveys. Despite these serious limitations, however, we believe that the “typical” work hours (and work dates) could be used to construct a relative indicator or index of work hours for comparative purposes within the dataset. For most analyses (see Figures 28 and 29), this index was simply a sum of the hours marked for each job divided by the number of jobs. Where a relative index of

total work exposures were needed (see Table 16), the typical hours were multiplied by the duration of employment, and the resulting measure was divided into tertiles (thirds), with the middle and highest tertile compared to the lowest. Sensitivity analyses using various assumptions about the days worked per week, as well as whether multiple jobs were concurrent or sequential, indicated that no real differences in conclusions would be drawn.

PRESENTATIONS AND PUBLICATIONS

Publications

Brunner WM, Lindgren PG, Langner DM, Williams AN, Yawn BP. (2005). "Asthma among rural Minnesota adolescents." J Asthma 42(9): 787-92. PMID: 16316875

Presentations

- Poster Session, Minnesota Community Health Conference, September 13, 2001.
- Invited presentation at NIOSH Childhood Agricultural Safety and Health PI Research Conference, Morgantown, September 17, 2002.
- Invited presentation at NIOSH Childhood Agricultural Safety and Health PI Research Conference, Morgantown, September 25, 2003.
- Invited presentation at NIOSH Childhood Agricultural Safety and Health PI Research Conference, Pittsburgh, September 17, 2004
- Minnesota Association of Career and Technical Administrators, 2003 State Conference
- Minnesota Safety Council, 2003 Fall Conference
- Minnesota Business Educators, Inc., 2003 Fall Conference
- Abstract accepted for presentation at the 7th World Conference on Injury Prevention and Safety Promotion, June 2004, Vienna (could not attend due to insufficient travel funds)
- Presentation, Asthma in Rural Minnesota Adolescents, National Asthma Conference, Atlanta, Georgia, April 15, 2004
- Presentation, Asthma in Minnesota: Is it Different?, Asthma Sharing Conference, St. Cloud, Minnesota, May 13, 2004

Web/Press Release

MDH Fact Sheet and Press Release: Asthma in Rural Minnesota Adolescents. May, 2004
<http://www.health.state.mn.us/divs/hpcd/cdee/asthma/documents/RuralAdolescents.pdf>

Anticipated Publications

Risk Factors for Injury Among Rural Minnesota Adolescents: Analysis of the Childhood Agricultural Trauma Evaluation System (CATES). PhD Dissertation, University of Minnesota

Prevalence, Risk Factors, and Impact of Asthma and Wheezing in a Population of Rural Minnesota Adolescents. PhD Dissertation, University of Minnesota

Work Experiences in Population of Rural Adolescents.

Work-Related Injuries in a Population of Rural Adolescents.

Acknowledgments

The Childhood Agricultural Trauma Evaluation System was supported by a grant from the National Institute for Occupational Safety and Health (NIOSH Grant 5R01OH004265-4). The content of this report is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute for Occupational Safety and Health.

We gratefully acknowledge the contributions of the original grant staff at MDH: Debora Boyle, DVM, PhD (original PI from 2000-2001); David Parker, MD; Teresa Hillmer, MPH, PhD; Marian Marbury, ScD; and Cathy Krug, MPH. We also wish to acknowledge the many contributions to this project by the following former and current MDH Center staff: L. Ronald French, MPH, PhD; Jayne Griffith, MPH; Jansen Price, Nicole Lisk, Lori Hillsmier, and Steve Golat.

We gratefully acknowledge the staff and students of the 41 Minnesota high schools involved in the *Youth at Work* projects during the 2001-2002 and 2002-2003 school years:

Albert Lea	Milaca Secondary
Bemidji Senior	Montevideo Senior
Brainerd Senior	Morris Area Secondary
Buffalo Lake-Hector	Murray County Central Secondary
C-G-B Secondary	Nevis Secondary
Cook County Secondary	New London Spicer
Dawson-Boyd Secondary	Nicollet Secondary
Fergus Falls Senior	Norman County West
Fulda Secondary	Northland Secondary
Glenville-Emmons Senior	Owatonna Senior
Greenway Senior	Parkers Prairie Secondary
Hayfield Secondary	Pelican Rapids Secondary
Henning Secondary	Pine Island Secondary
Hinckley-Finlayson Secondary	Red Rock Central Secondary
Jefferson Senior and Discovery Middle	Sebeka Secondary
Kingsland Senior	St. Peter Senior
Lafayette High	Tracy Secondary
Lesueur-Henderson Secondary	Tri-County Secondary
Lincoln Secondary	Underwood Secondary
Luverne Senior	United South Central Senior
Marshall County Central Secondary	

We greatly acknowledge the current and past members of the *Youth At Work* Advisory Board who critical contributions and insights made this project possible:

B.J. Anderson	Children, Families and Learning
Ann Bajari	Meeker-Mcleod-Sibley Public Health
Nancy Cowell	Sibley East Junior High
John Engelking	Sibley East Junior High
Jim Ertl	MN CFL Lifework Development
Peter Hannan	University of Minnesota
Deborah Hennrikus	University of Minnesota
Jan Kellner	MN CFL Lifework Development
Ed Larsen	Retired Principal, Pequot Lakes High School
Joe Miller	Lester Prairie High School
Ilene Nelsen	Meeker County Public Health
Craig Rayman	Glenville-Emmons High School
Tim Rice	Eden Valley-Watkins High School
Michele Schermann	University of Minnesota Extension Services
John Shutske	University of Minnesota Extension Services
John Smith	Glencoe – Silver Lake High School
Ann Streed	Morris Area Secondary School

Figure 1a. Minnesota Counties and Agricultural Regions¹ Used in Selection of Schools

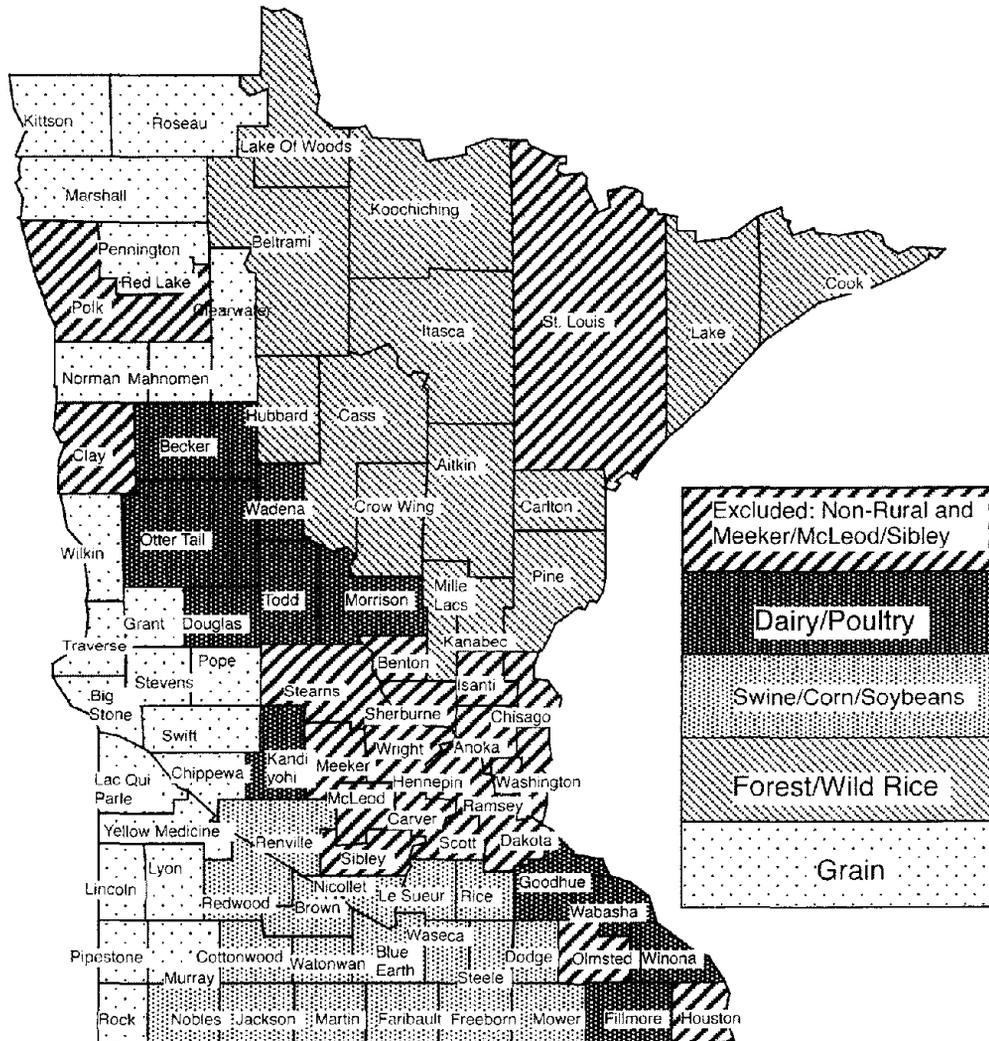


Figure 1b. Locations of 41 Participating Schools

¹See text for definitions. Excluded counties include the Minneapolis-St. Paul Metro area and other non-rural counties plus three rural counties that participated in two previous adolescent work-injury surveillance and intervention studies.

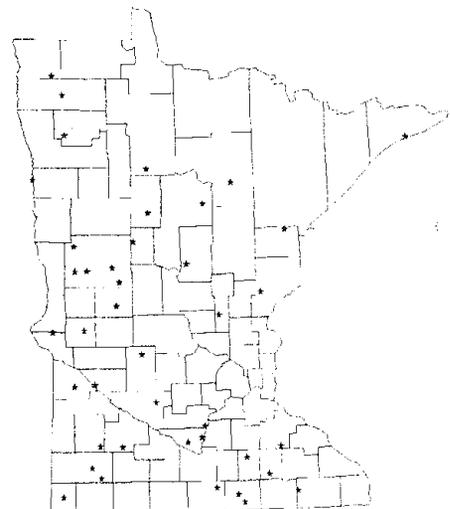


Figure 2. School Recruitment Process

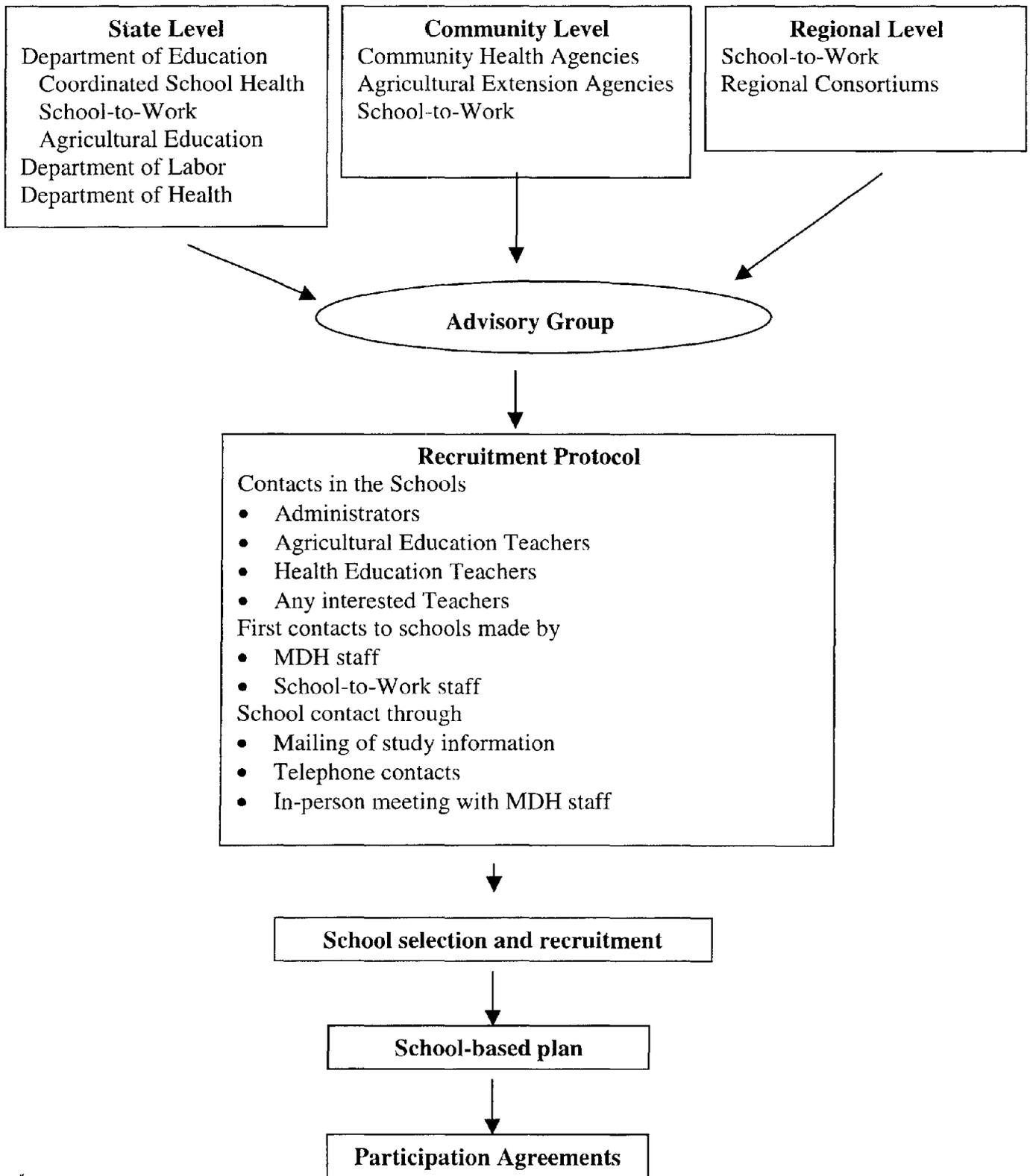


Figure 3. Potential Factors Related to Injury or Asthma in Rural Adolescents

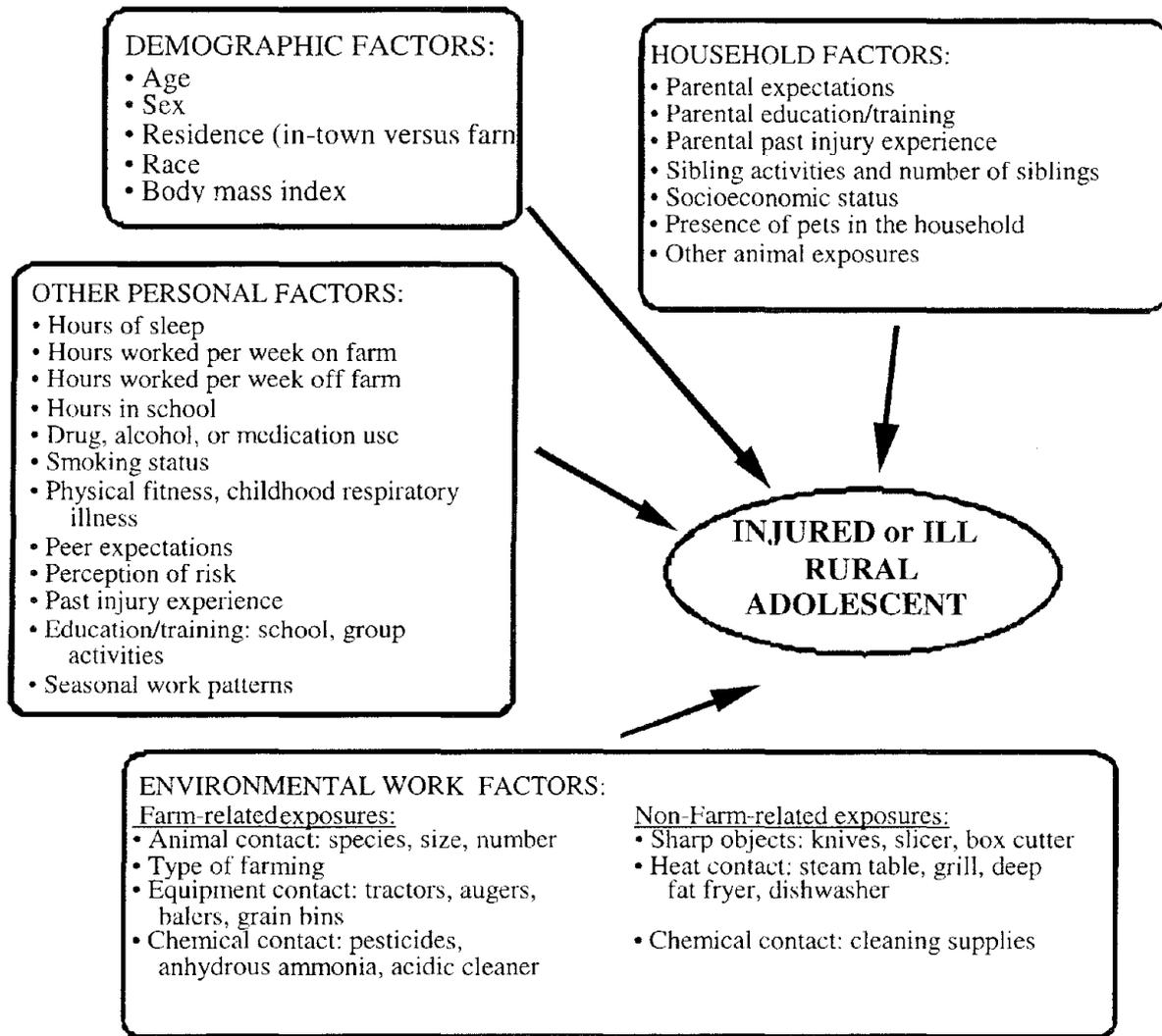
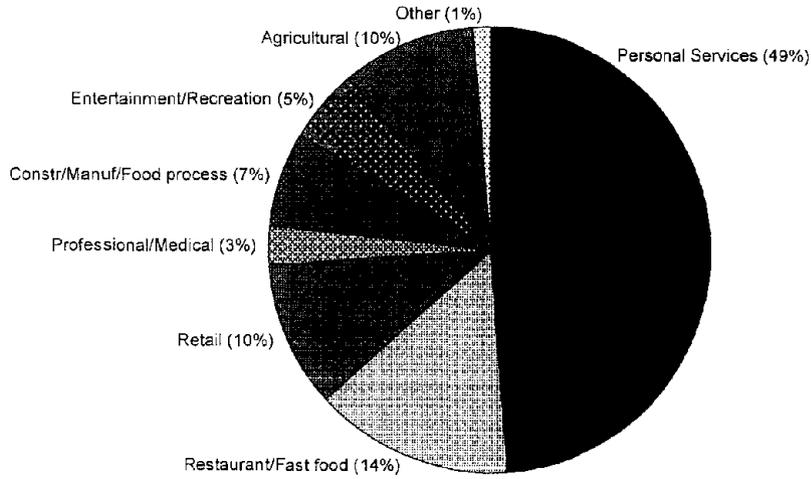
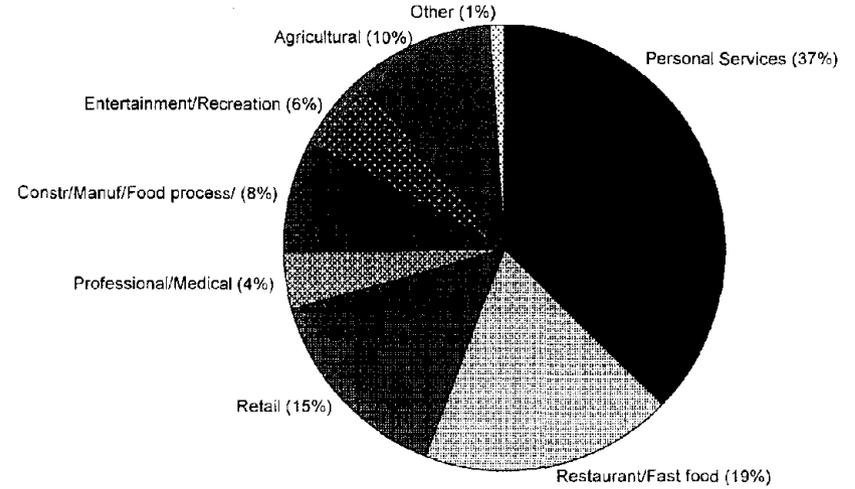


Figure 4. Distribution of All Jobs by Major Categories and Survey Period.

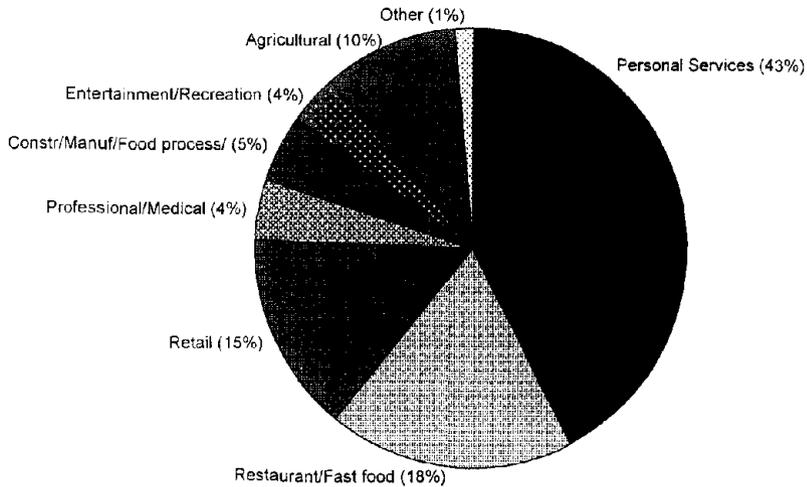
a. Summer 2001 (N=24,512 jobs)



c. Summer 2002 (N=12,496 jobs)



b. School Year 2001-2002 (N=13,931 jobs)



d. School Year 2002-2003 (N=7540 jobs)

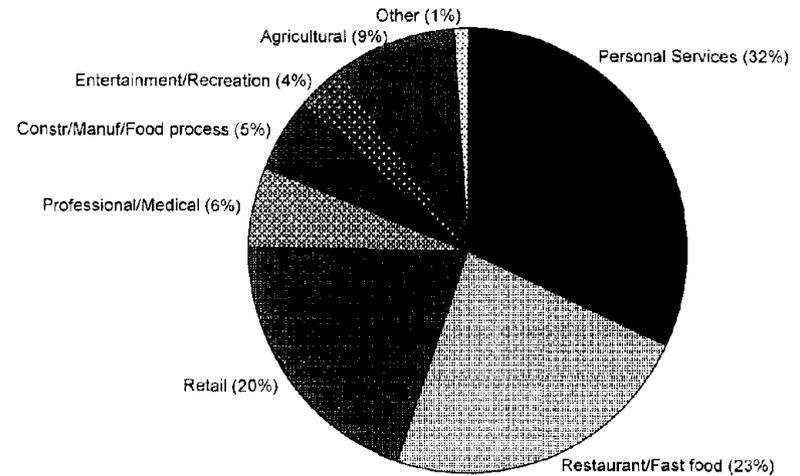
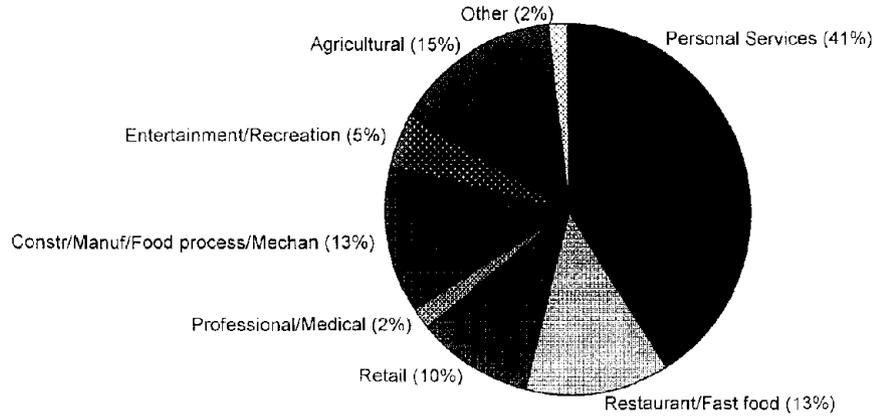
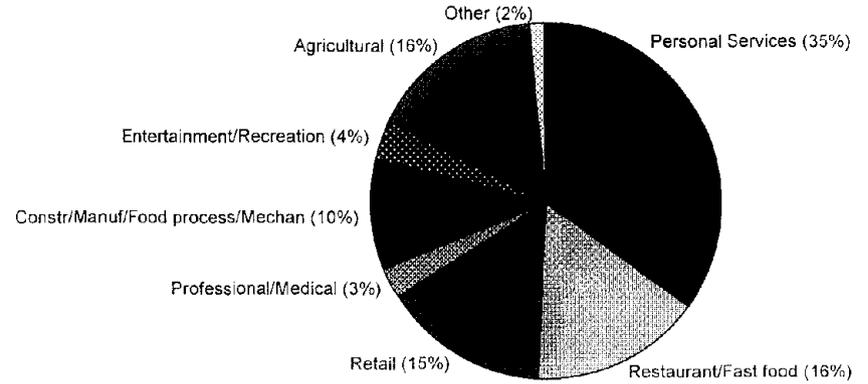


Figure 5. Distribution of All Jobs by Gender for Summer 2001 and School Year 2001-2002.

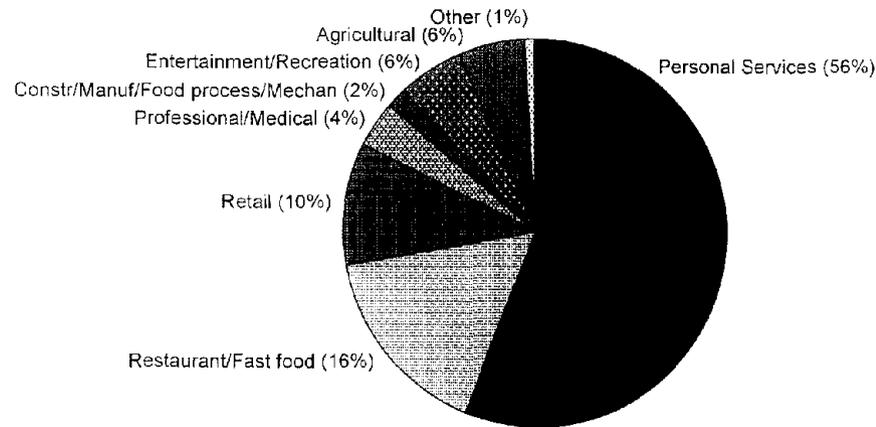
a. Boys, Summer 2001 (N=11,614 jobs)



c. Boys, School Year 2001-2002 (N=6,034 jobs)



b. Girls, Summer 2001 (N=12,883 jobs)



d. Girls, School Year 2001-2002 (N=7,873 jobs)

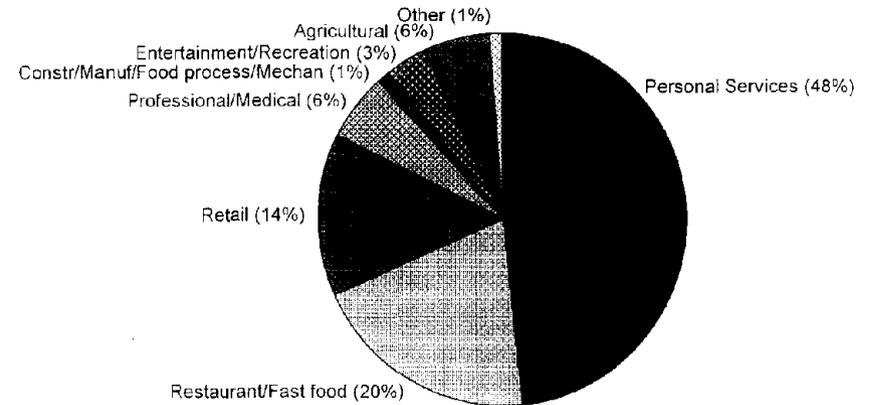
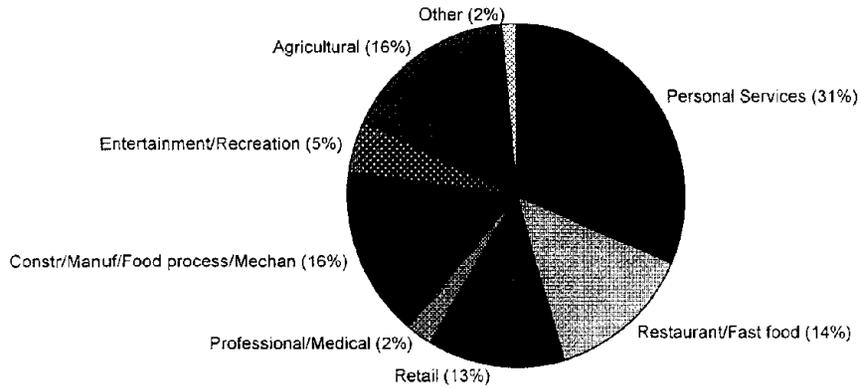
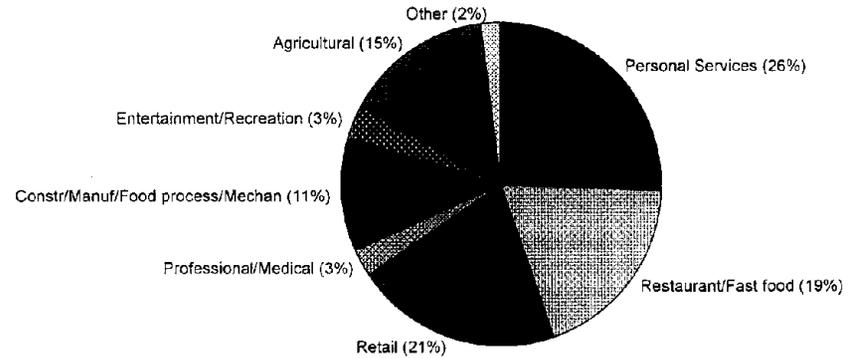


Figure 6. Distribution of All Jobs by Gender by Summer 2002 and School Year 2002-2003.

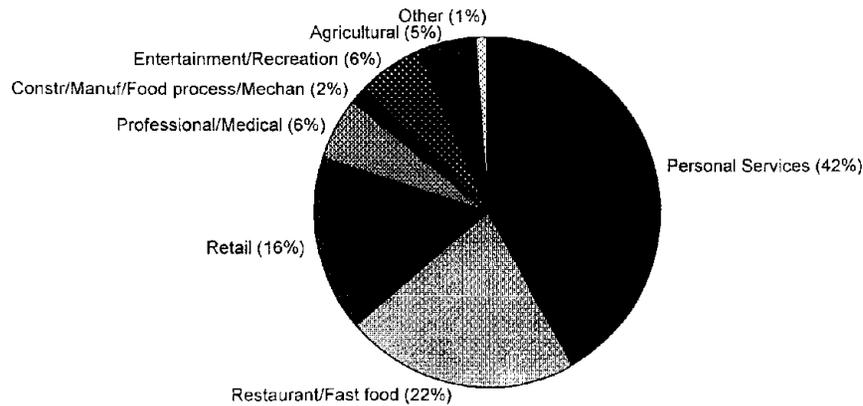
a. Boys, Summer 2002 (N=5603 jobs)



c. Boys, School Year 2002-2003 (N=3004 jobs)



b. Girls, Summer 2002 (N=6887)



d. Girls, School Year 2002-2003 (N=4530 jobs)

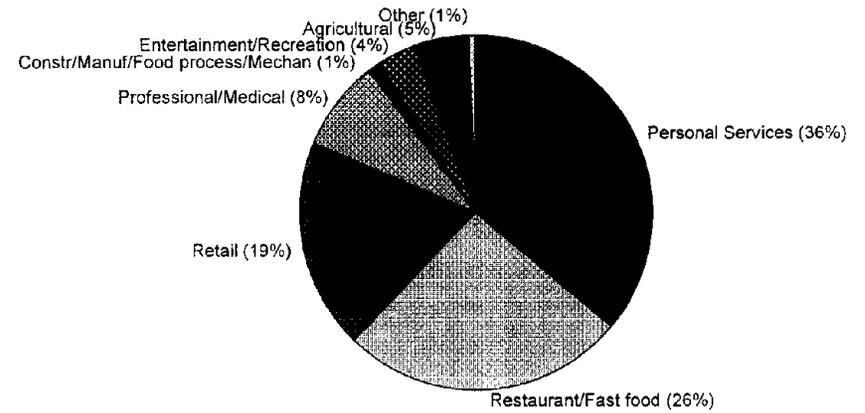
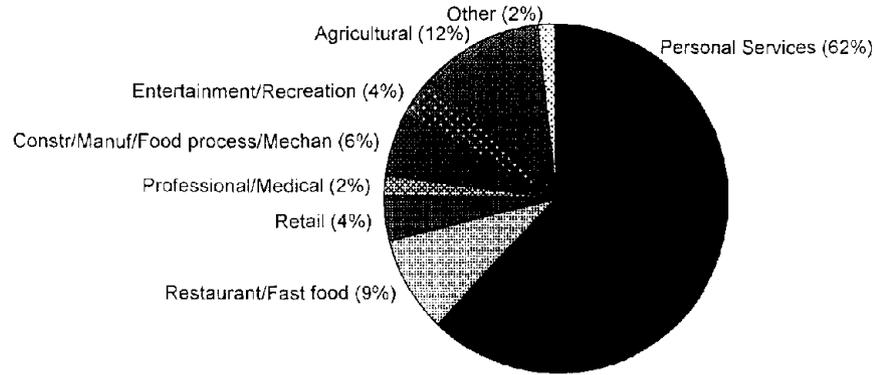
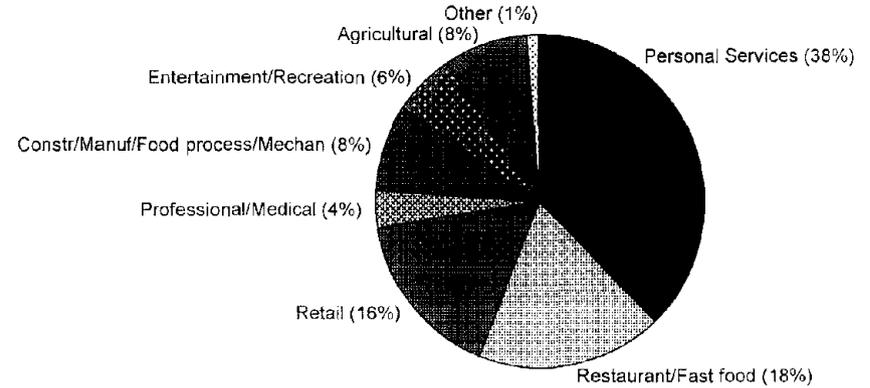


Figure 7. Distribution of All Jobs by Grade, Summer 2001.

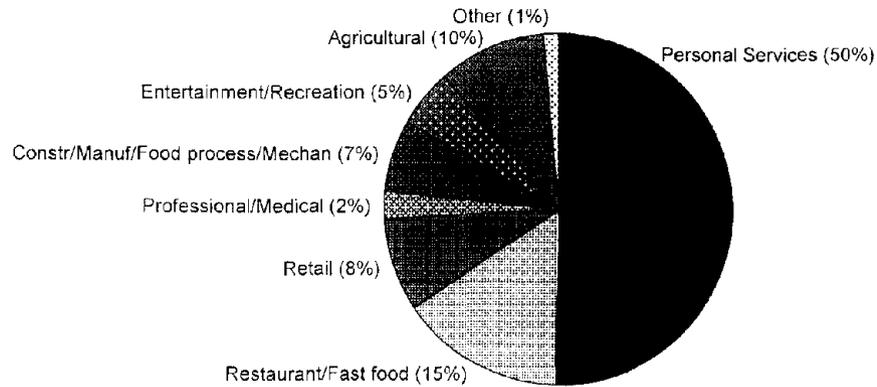
a. Grade 9, Summer 2001 (N=7514 jobs)



c. Grade 11, Summer 2001 (N=8894 jobs)



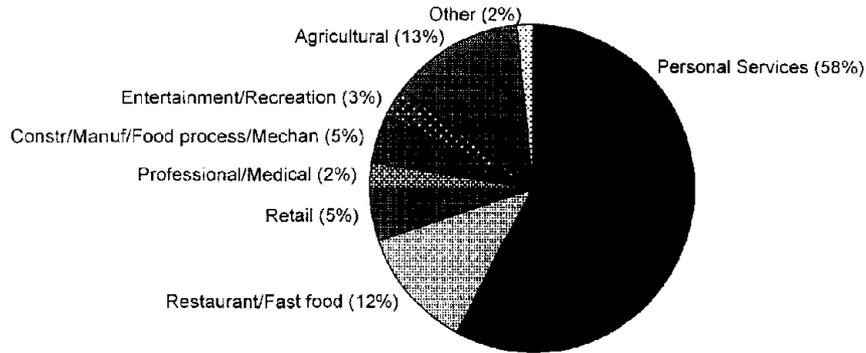
b. Grade 10, Summer 2001 (N=7552 jobs)



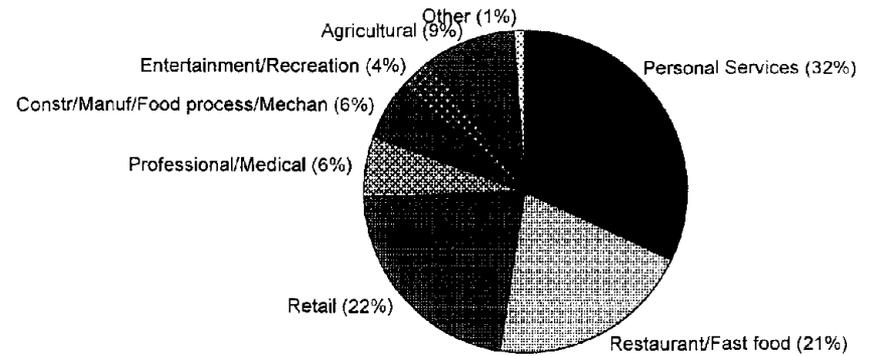
d. Grade 12, Summer 2001 (not surveyed)

Figure 8. Distribution of All Jobs by Grade, School Year 2001-02.

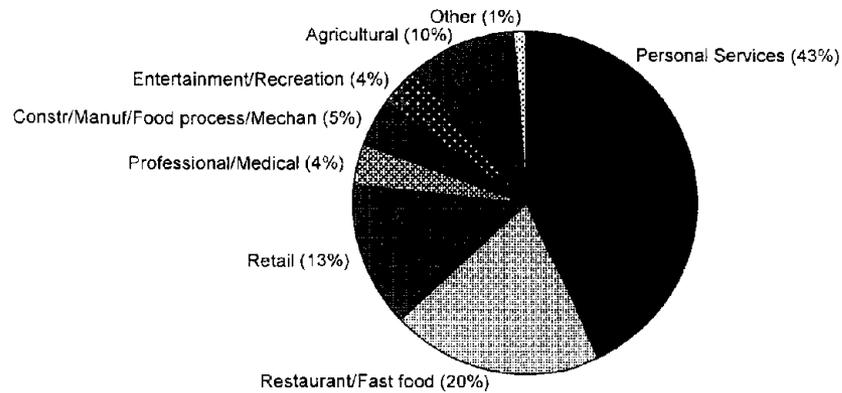
a. Grade 9, School Year 2001-02 (N=3828 jobs)



c. Grade 11, School Year 2001-02 (N=5301 jobs)



b. Grade 10, School Year 2001-02 (N=4586 jobs)

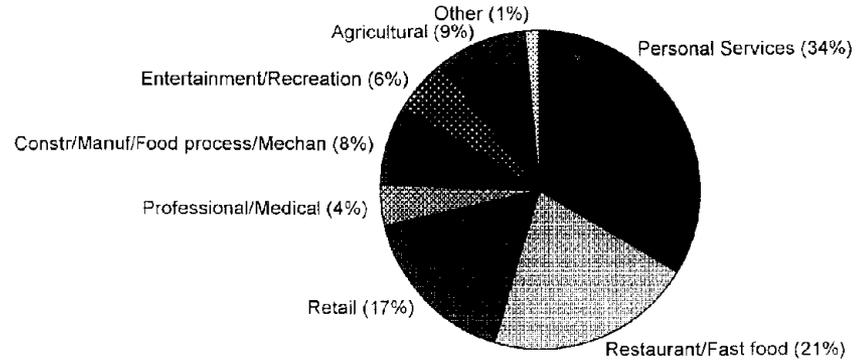


d. Grade 12, School Year 2001-02 (not surveyed)

Figure 9. Distribution of All Jobs by Grade, Summer 2002.

a. Grade 9, Summer 2002 (*no participants)

c. Grade 11, Summer 2002 (N=4113 jobs)



b. Grade 10, Summer 2002 (N=3996 jobs)

d. Grade 12, Summer 2002 (N=4369)

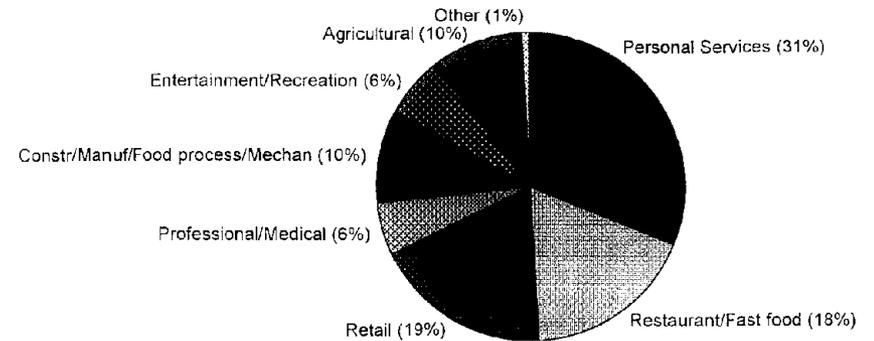
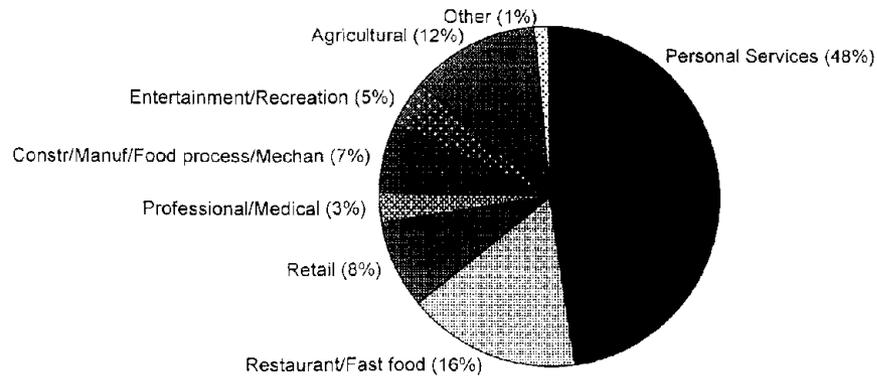
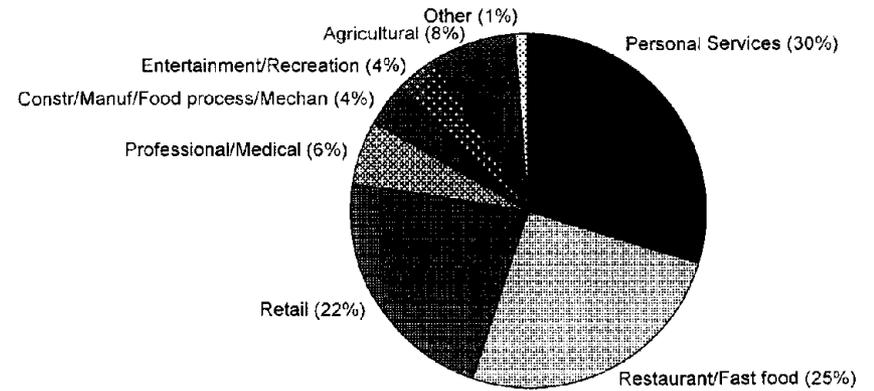


Figure 10. Distribution of All Jobs by Grade, School Year 2002-03.

a. Grade 9, School Year 2002-03 (*no participants)

c. Grade 11, School Year 2002-03 (N=2650 jobs)



b. Grade 10, School Year 2002-03 (N=2429 jobs)

d. Grade 12, School Year 2002-03 (N=2445)

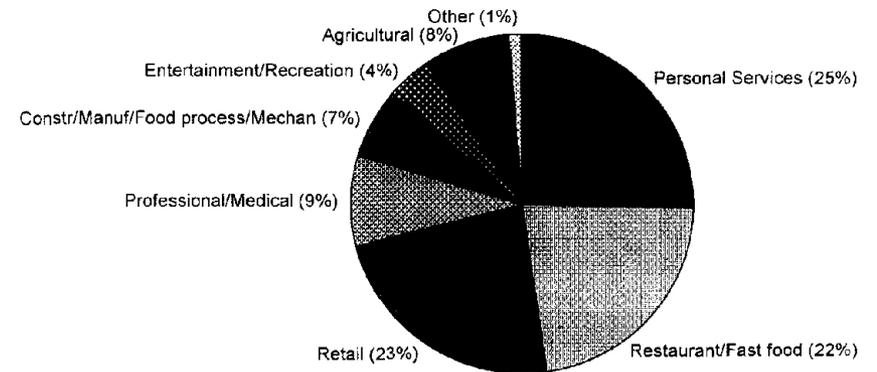
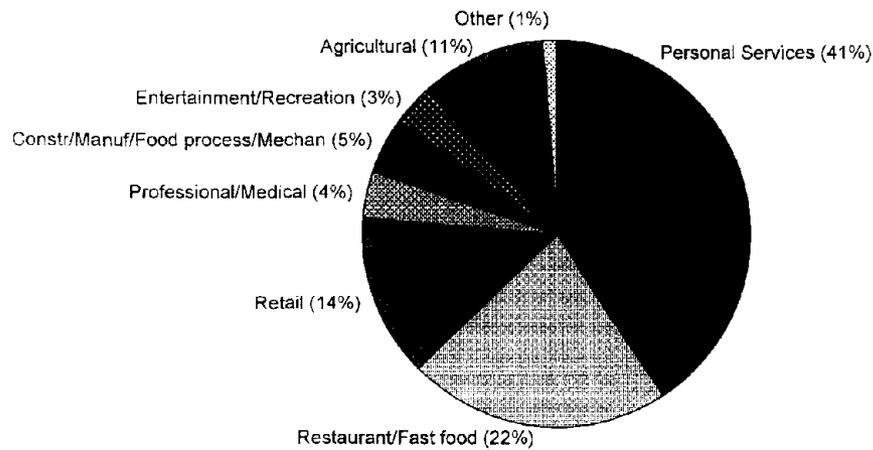


Figure 11. Percent of All Jobs Involving Specific Agricultural Tasks.

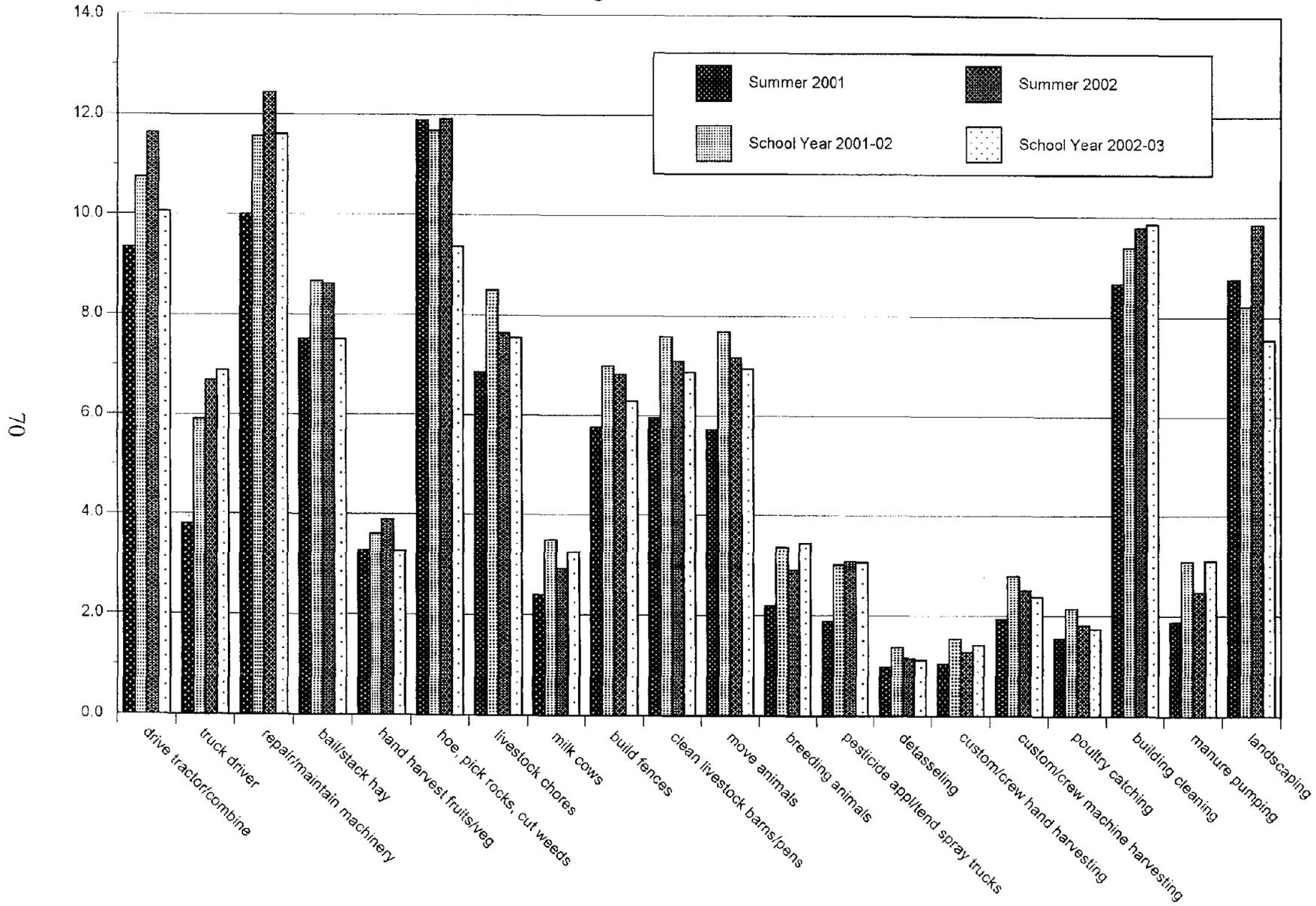


Figure 12. Percent of All Jobs Involving Specific Agricultural Tasks, Boys.

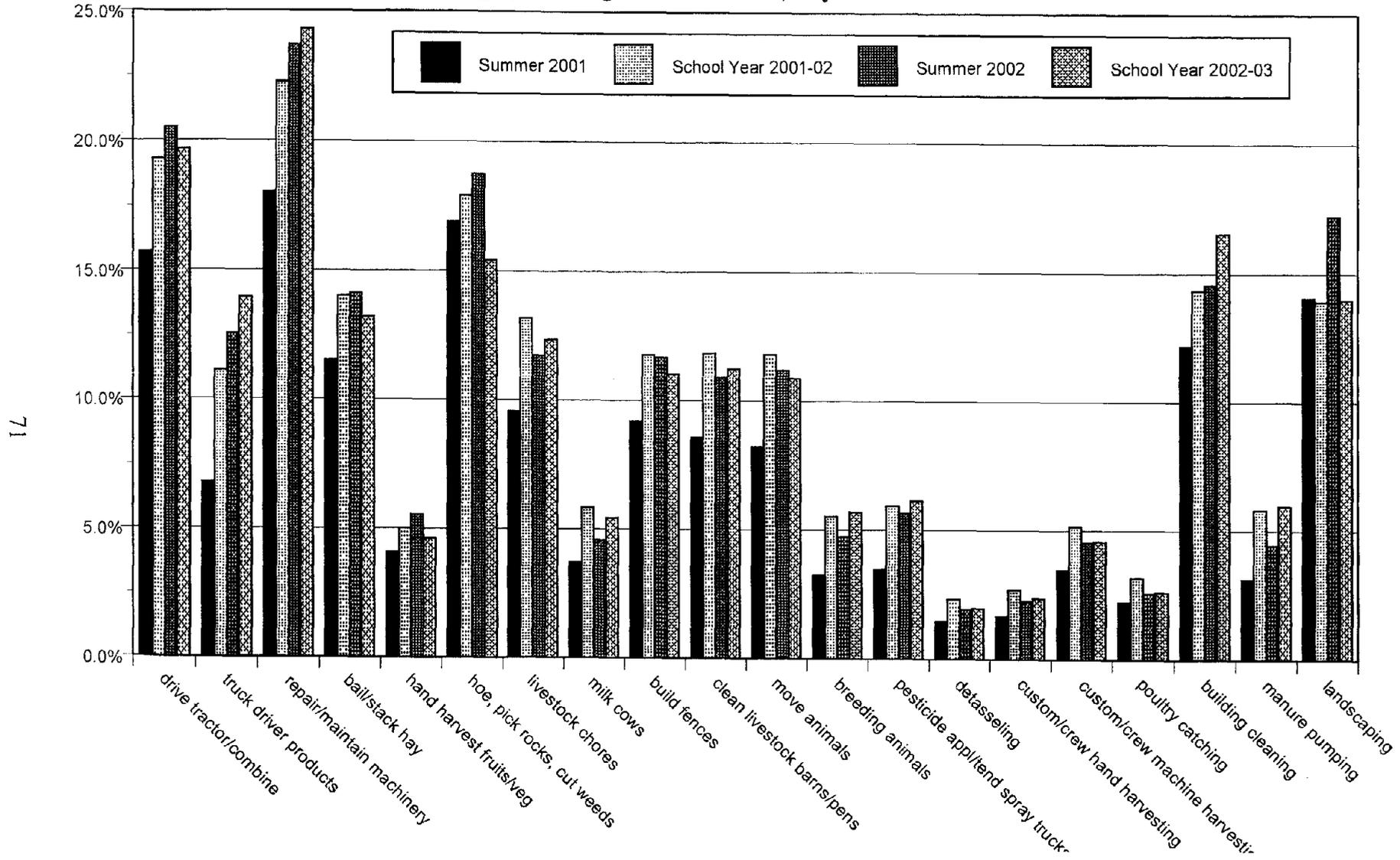


Figure 13. Percent of All Jobs Involving Specific Agricultural Tasks, Girls.

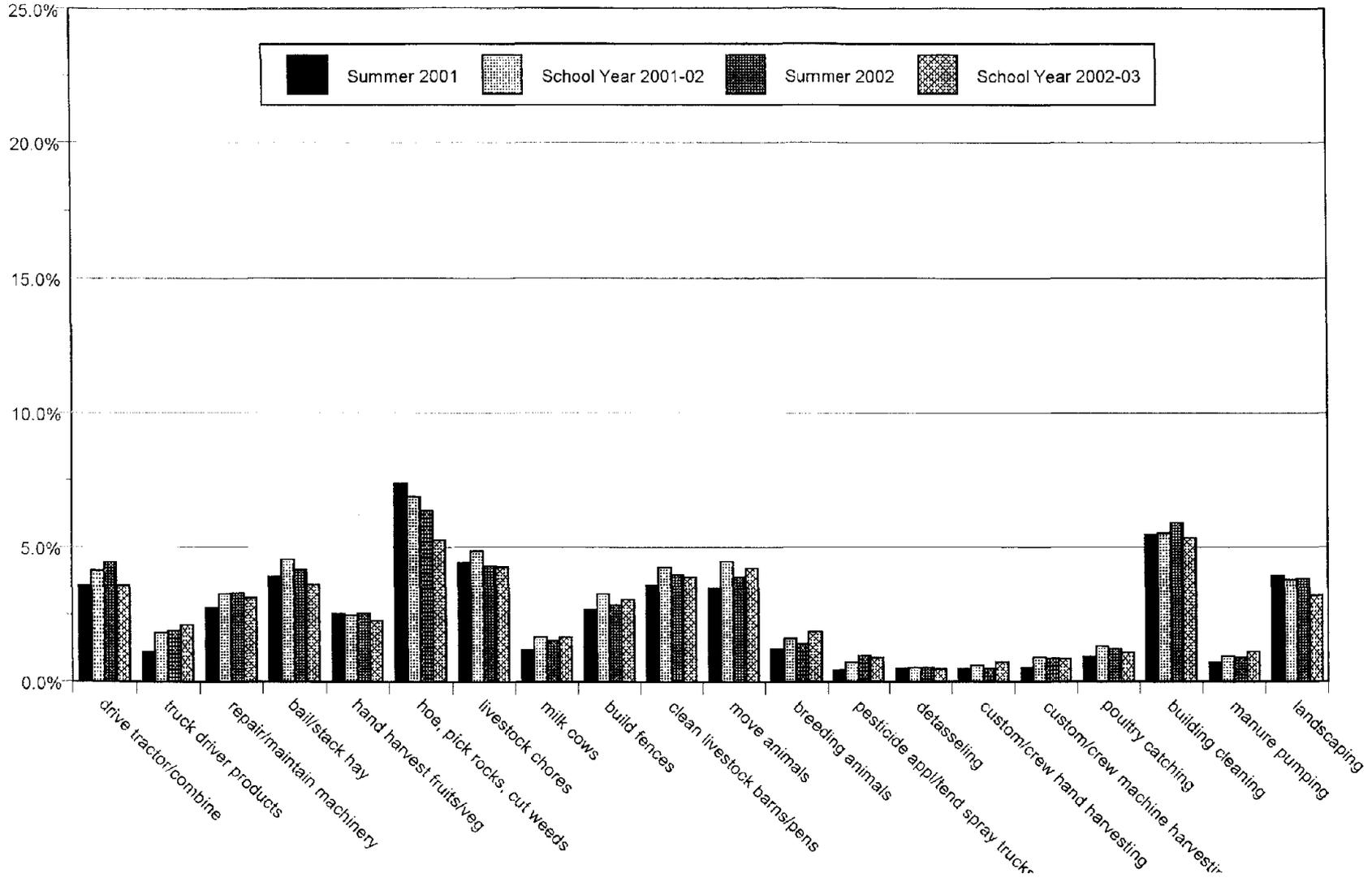


Figure 14. Percent of All Jobs Involving Selected Hazardous Activities.

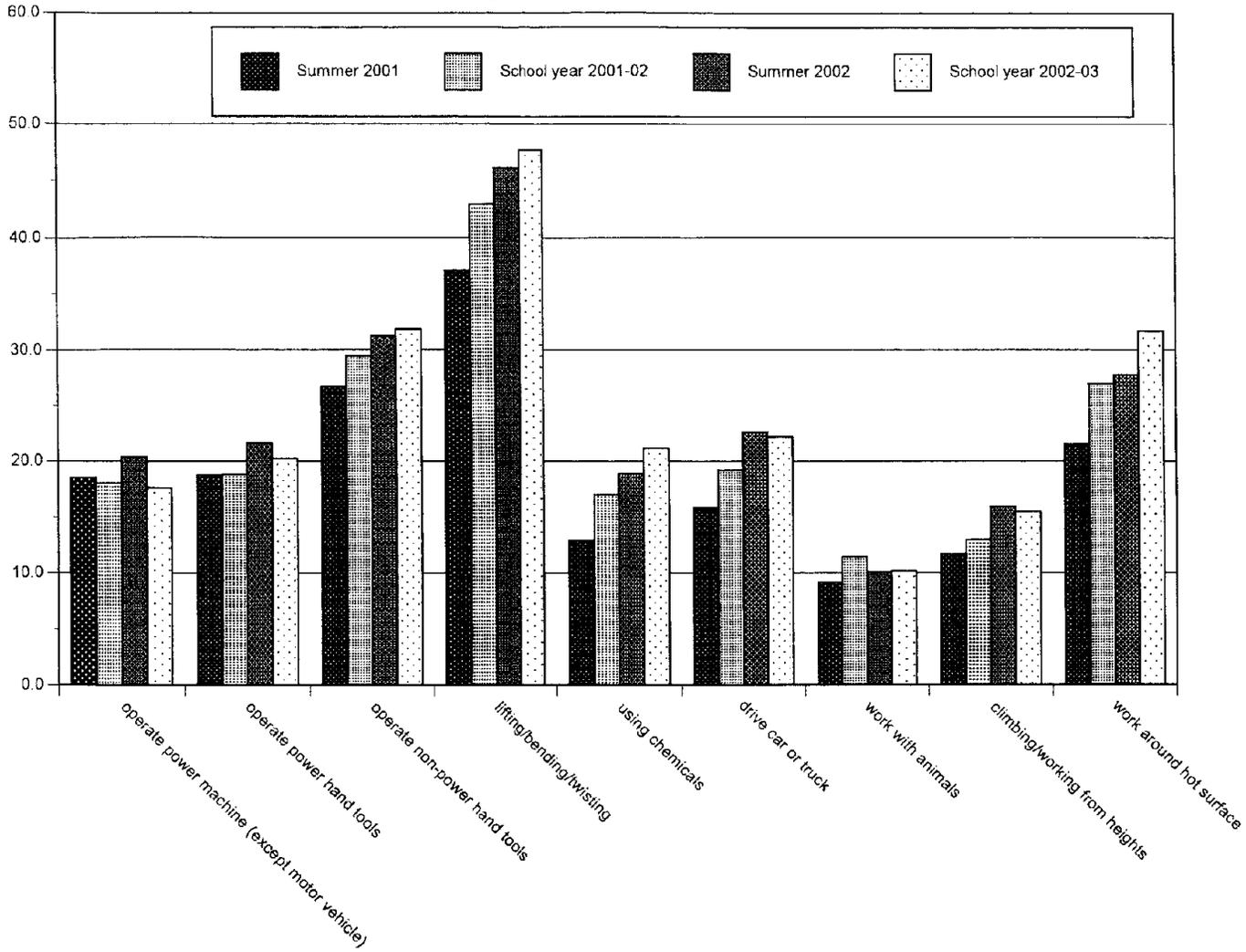


Figure 15. Percent of All Jobs Involving Selected Hazardous Activities, Boys.

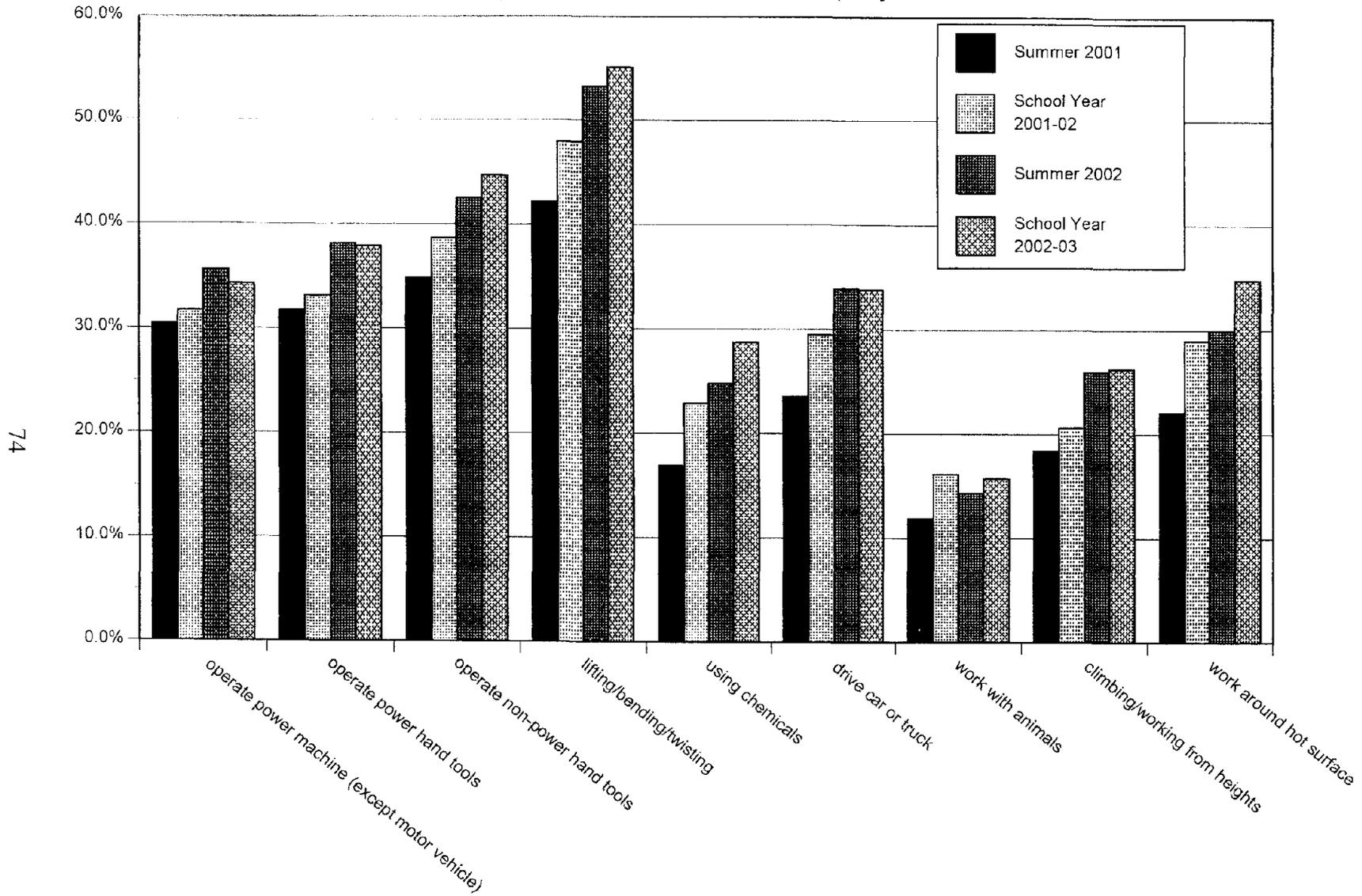


Figure 16. Percent of All Jobs Involving Selected Hazardous Activities, Girls.

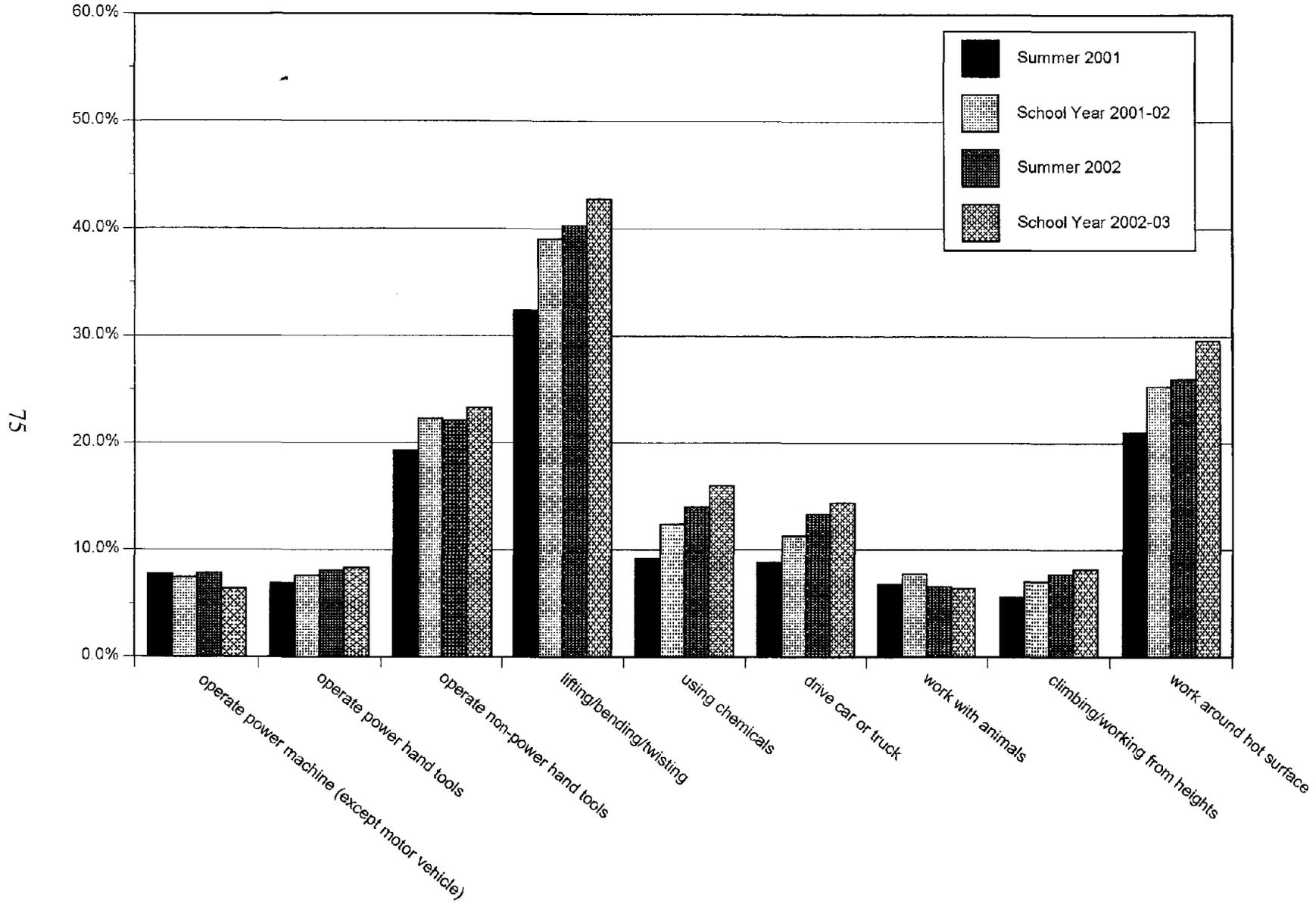
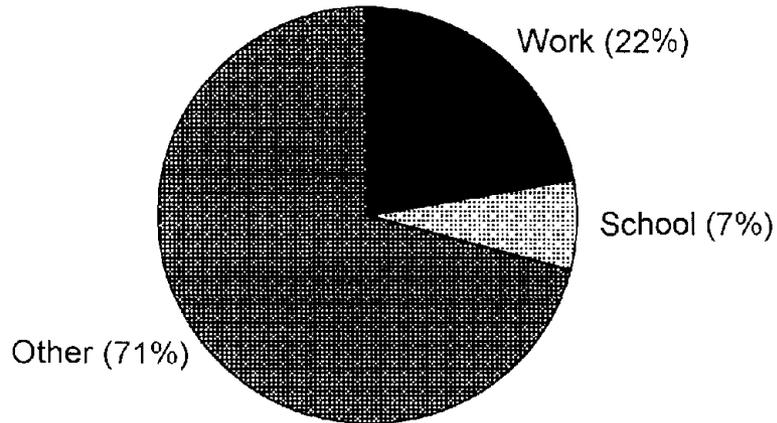
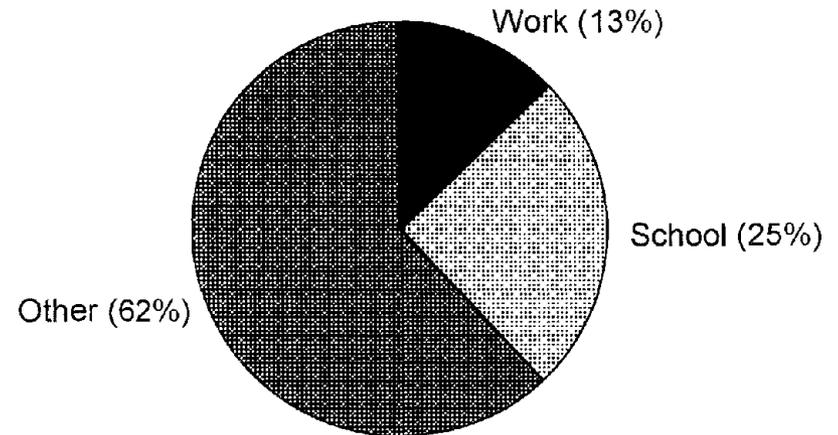


Figure 17. Where Injuries Occurred by Survey Period.

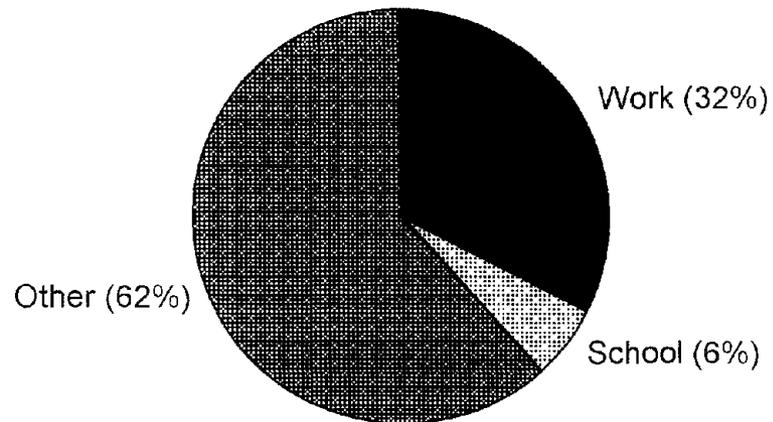
a. Summer 2001 (N=1693 injuries)



b. School Year 2001-02 (N=1334 injuries)



c. Summer 2002 (N=513 injuries)



d. School Year 2002-03 (N=506 injuries)

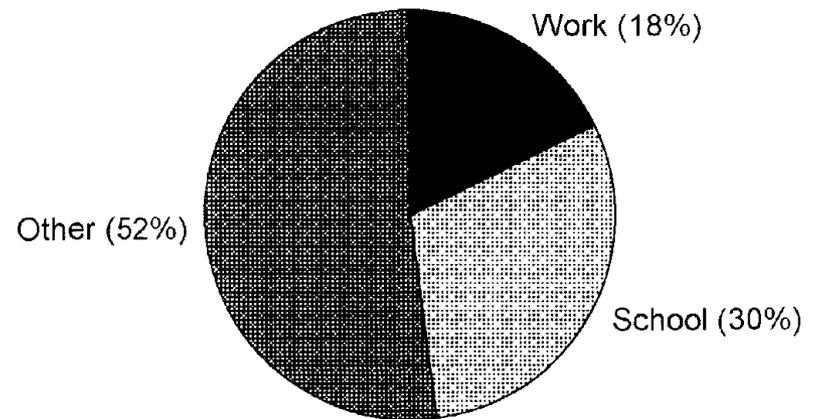
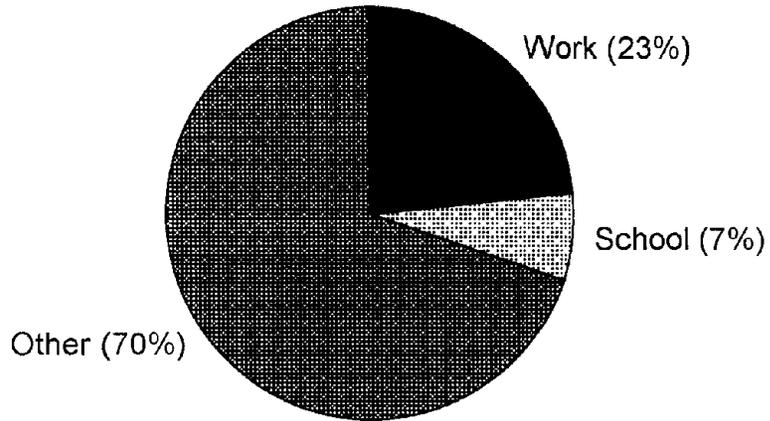
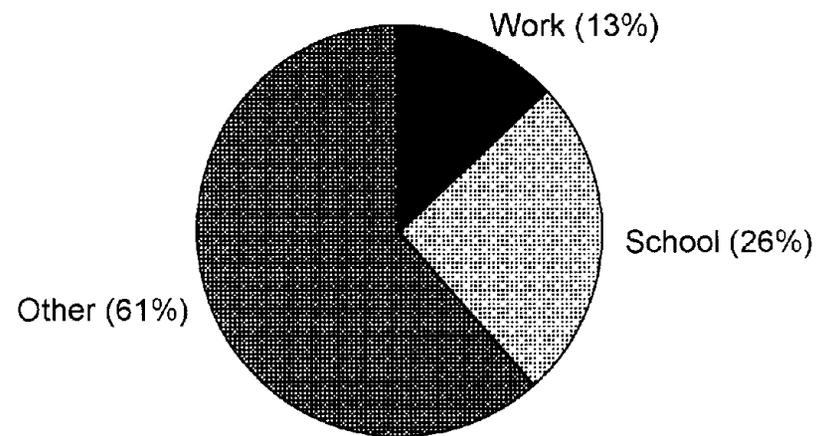


Figure 18. Where Injuries Occurred by Survey Period, Boys.

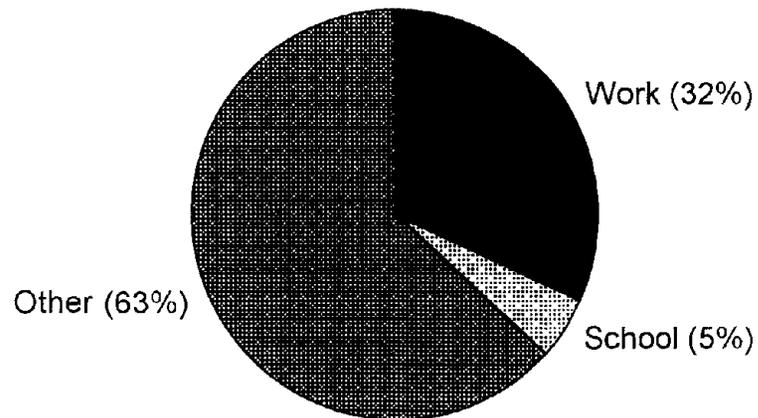
a. Summer 2001 (N=930 injuries)



b. School Year 2001-02 (N=694 injuries)



c. Summer 2002 (N=269 injuries)



d. School Year 2002-03 (N=236 injuries)

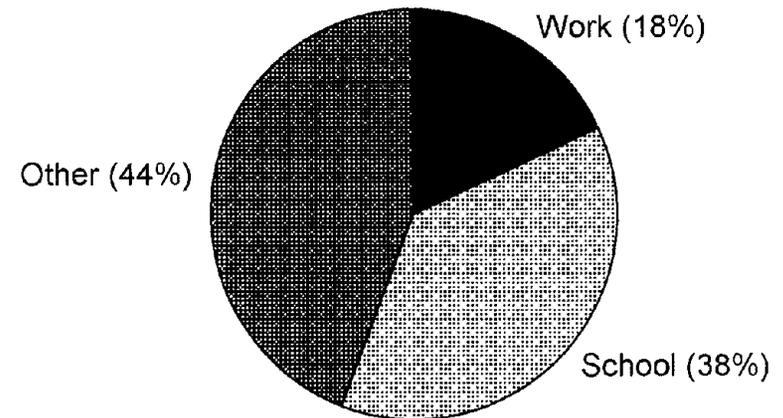
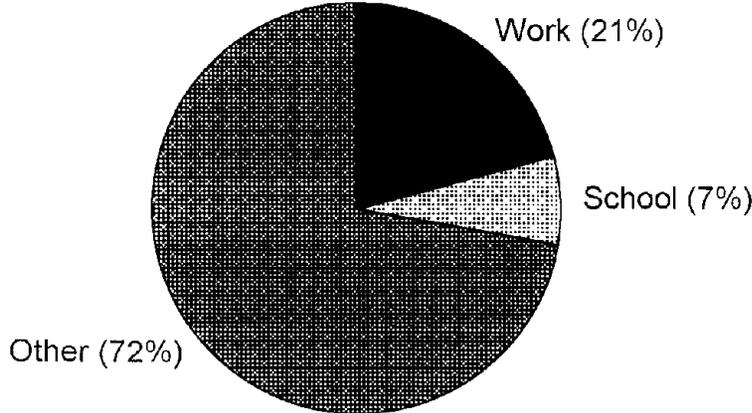
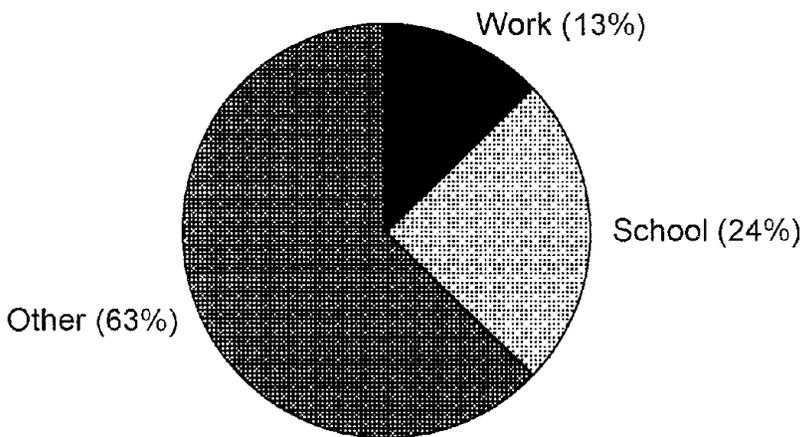


Figure 19. Where Injuries Occurred by Survey Period, Girls.

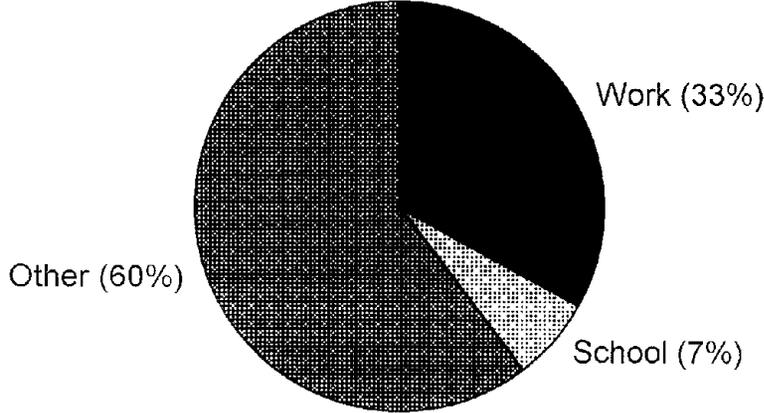
a. Summer 2001 (N=761 injuries)



b. School Year 2001-02 (N=635 injuries)



c. Summer 2002 (N=244 injuries)



d. School Year 2002-03 (N=267 injuries)

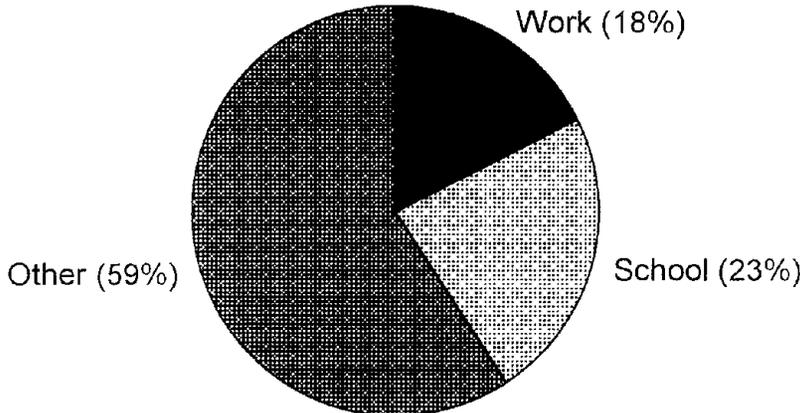
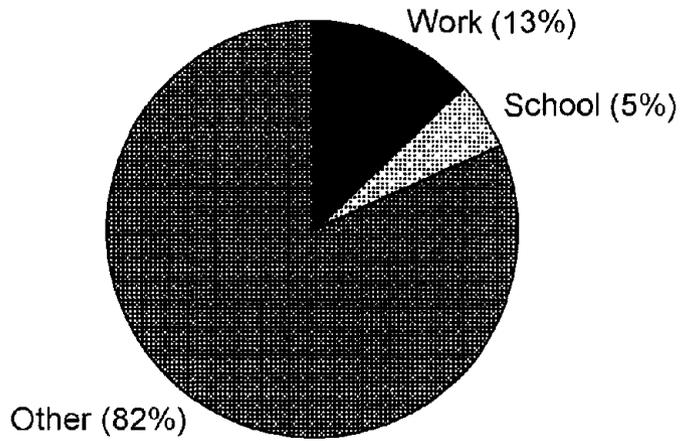
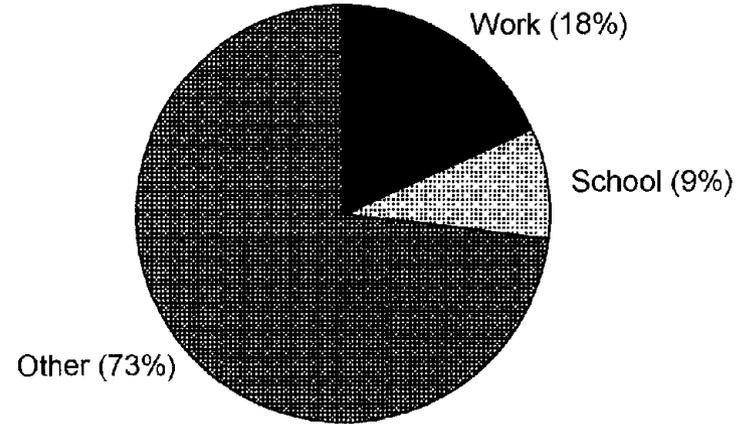


Figure 20. Where Injuries Occurred by Grade, Summer 2001.

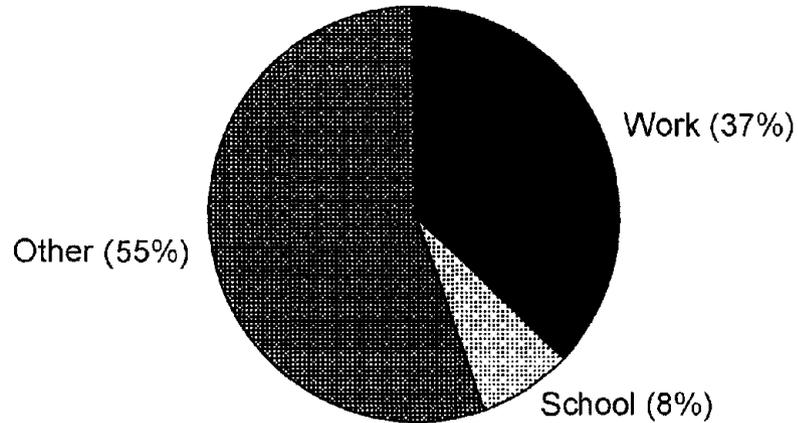
a. Grade 9 (N=691 injuries)



b. Grade 10 (N=500 injuries)



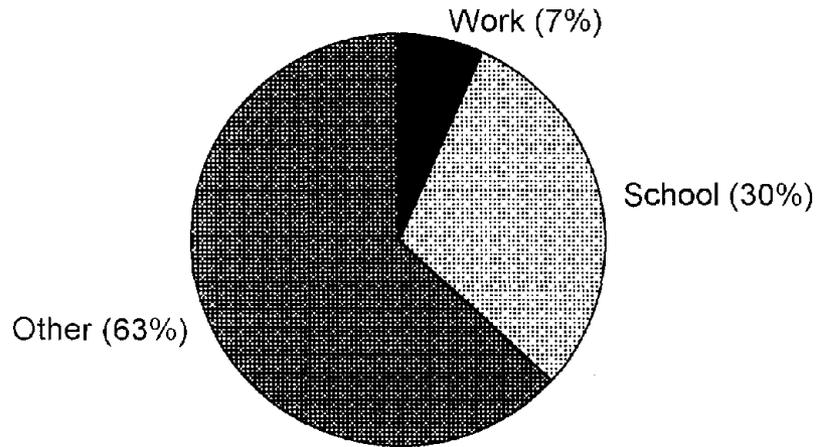
c. Grade 11 (N=479 injuries)



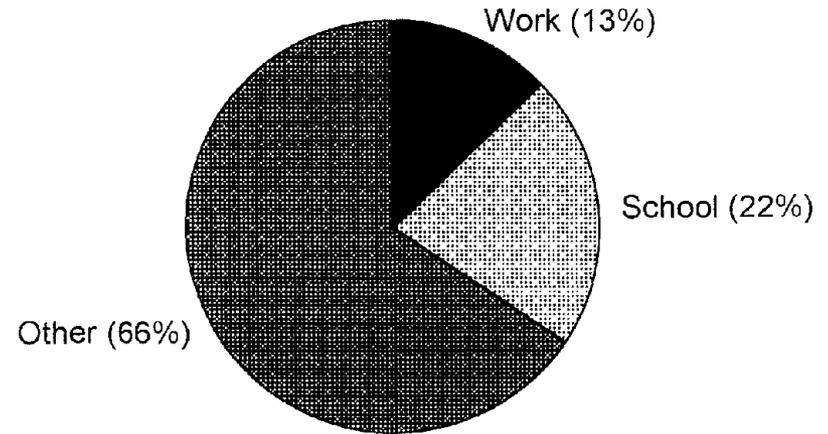
d. Grade 12 (not surveyed)

Figure 21. Where Injuries Occurred by Grade, School Year 2001-02.

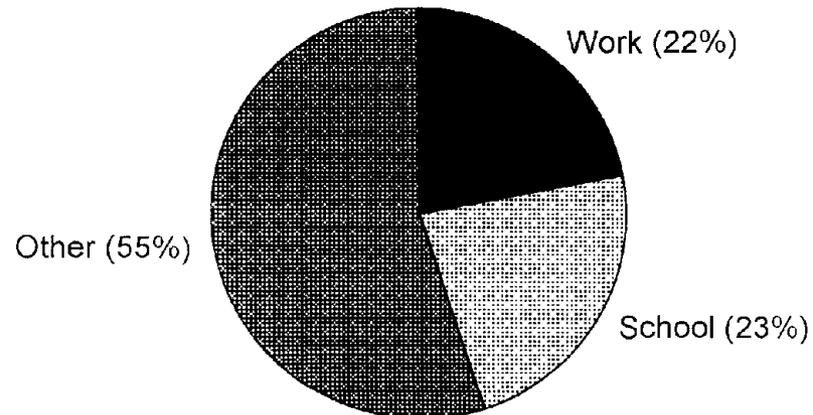
a. Grade 9 (N=520 injuries)



b. Grade 10 (N=444 injuries)



c. Grade 11 (N=355 injuries)

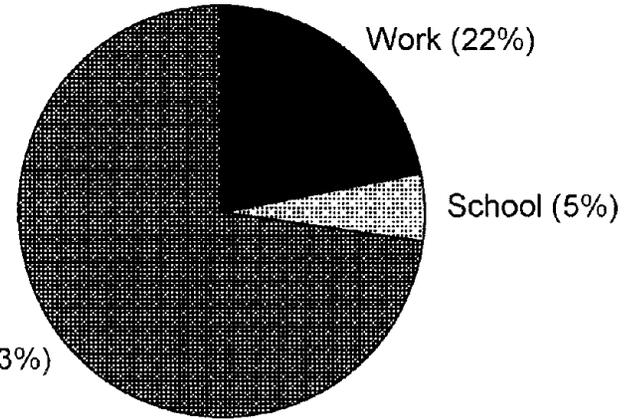


d. Grade 12 (not surveyed)

Figure 22. Where Injuries Occurred by Grade, Summer 2002.

a. Grade 9 (not surveyed)

b. Grade 10 (N=214 injuries)



c. Grade 11 (N=136 injuries)

d. Grade 12 (N=163 injuries)

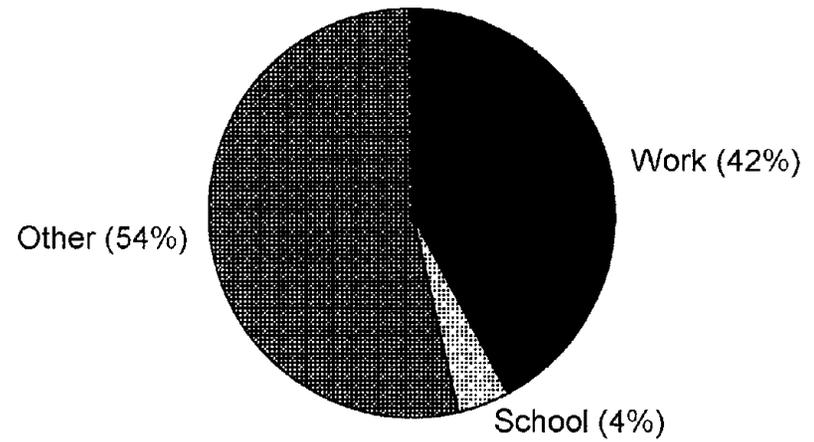
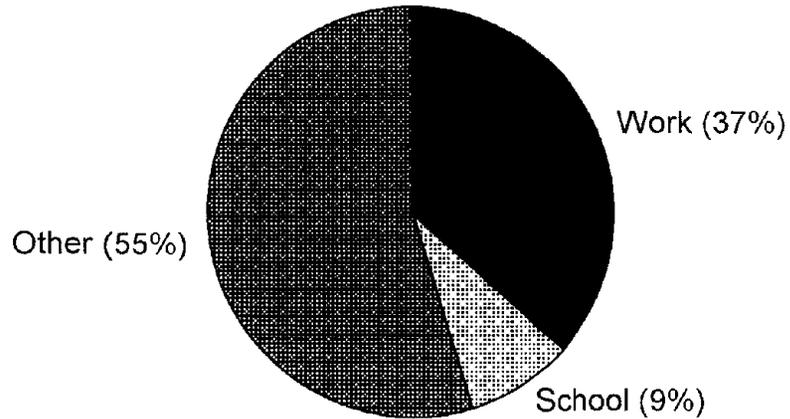
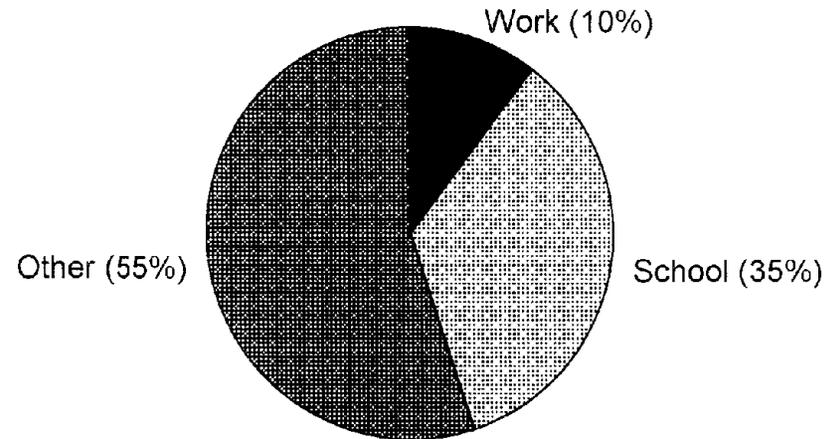


Figure 23. Where Injuries Occurred by Grade, School Year 2002-03.

a. Grade 9 (not surveyed)

b. Grade 10 (N=231 injuries)



c. Grade 11 (N=137 injuries)

d. Grade 12 (N=132 injuries)

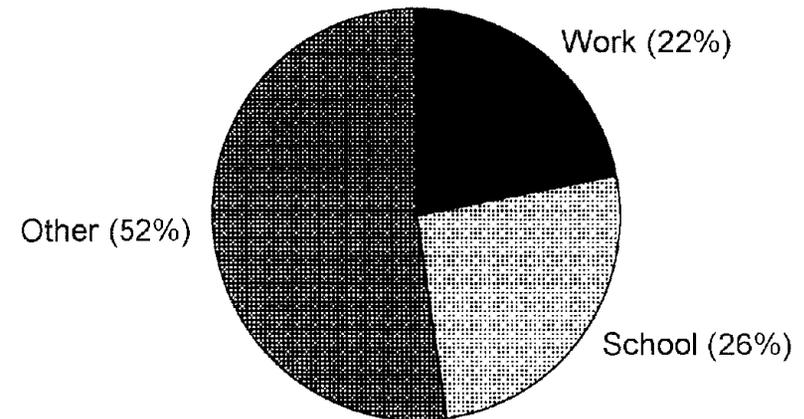
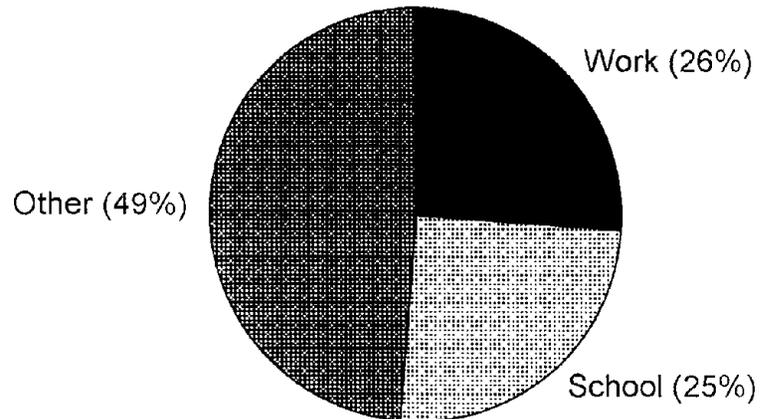
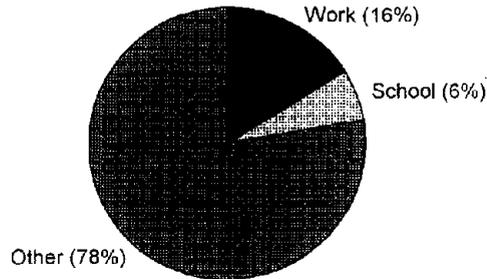
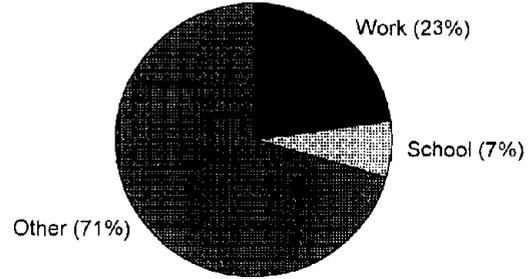


Figure 24. Where Injury Occurred by Race and Survey Period.

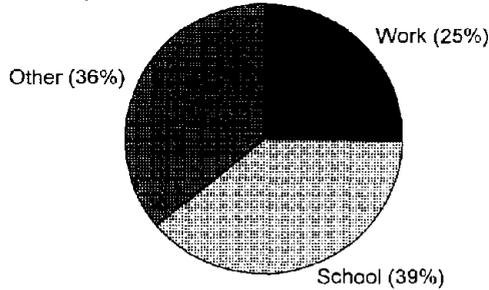
a. Non-White, Summer 2001 (N=117 injuries)



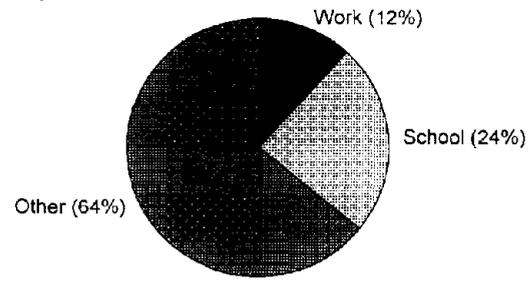
b. White, Summer 2001 (N=1550 injuries)



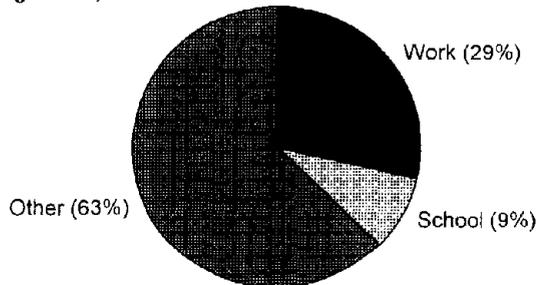
c. Non-White, School Year 2001-02 (N=83 injuries)



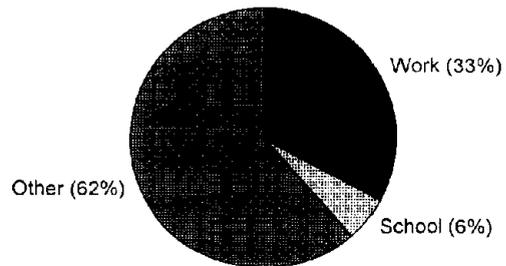
d. White, School Year 2001-02 (N=1233 injuries)



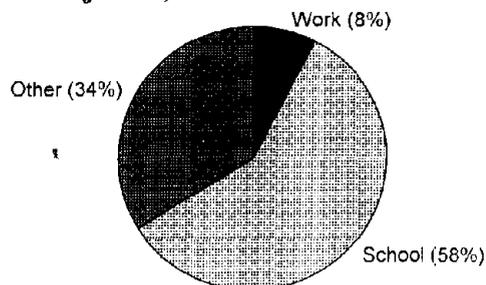
e. Non-White, Summer 2002 (N=32 injuries)



f. White, Summer 2002 (N=481 injuries)



g. Non-White, School Year 2002-03 (N=53 injuries)



h. White, School Year 2002-03 (N=452 injuries)

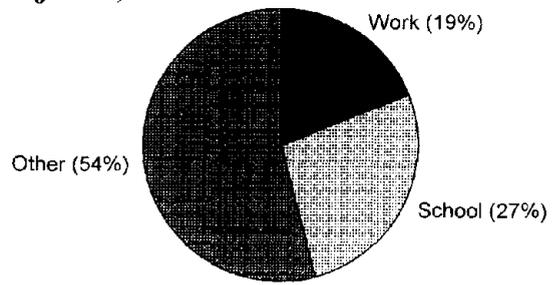
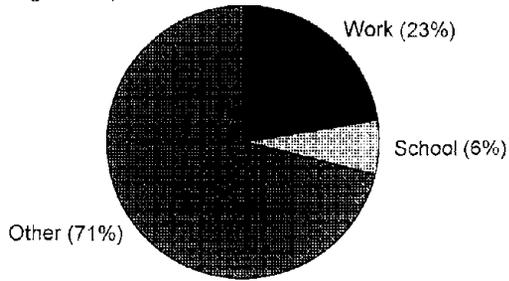
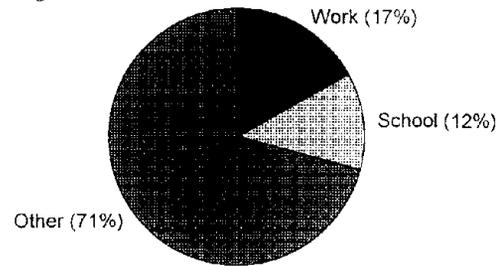


Figure 25. Where Injury Occurred by Ethnicity and Survey Period.

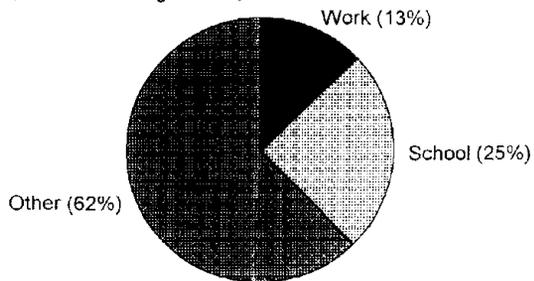
a. Non-Hispanic, Summer 2001 (N=1577 injuries)



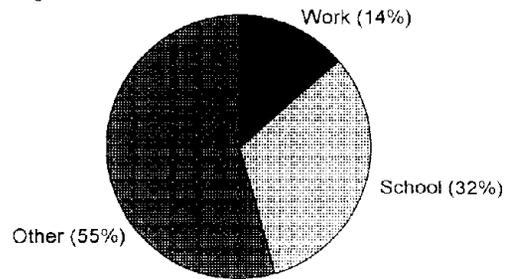
b. Hispanic, Summer 2001 (N=81 injuries)



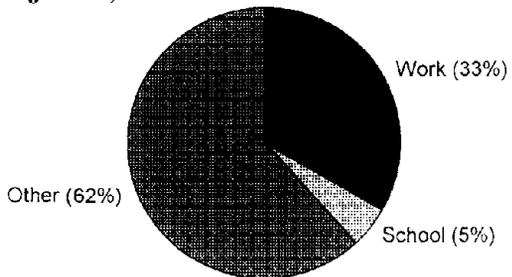
c. Non-Hispanic, School Year 2001-02 (N=1274 injuries)



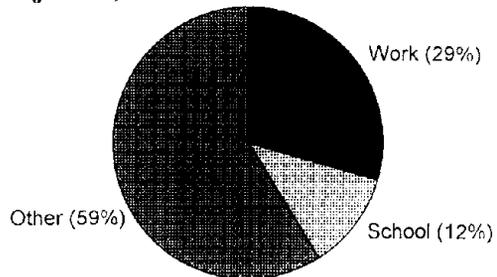
d. Hispanic, School Year 2001-02 (N=44 injuries)



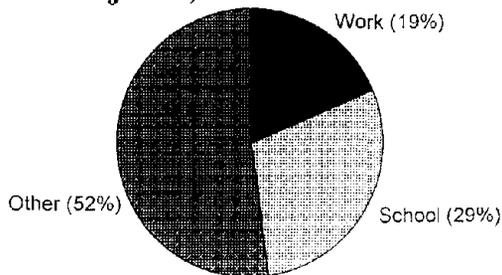
e. Non-Hispanic, Summer 2002 (N=485 injuries)



f. Hispanic, Summer 2002 (N=17 injuries)



g. Non-Hispanic, School Year 2002-03 (N=474 injuries)



h. Hispanic, School Year 2002-03 (N=24 injuries)

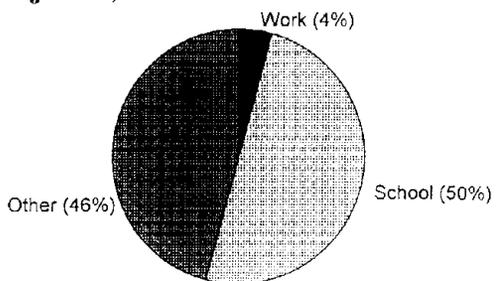
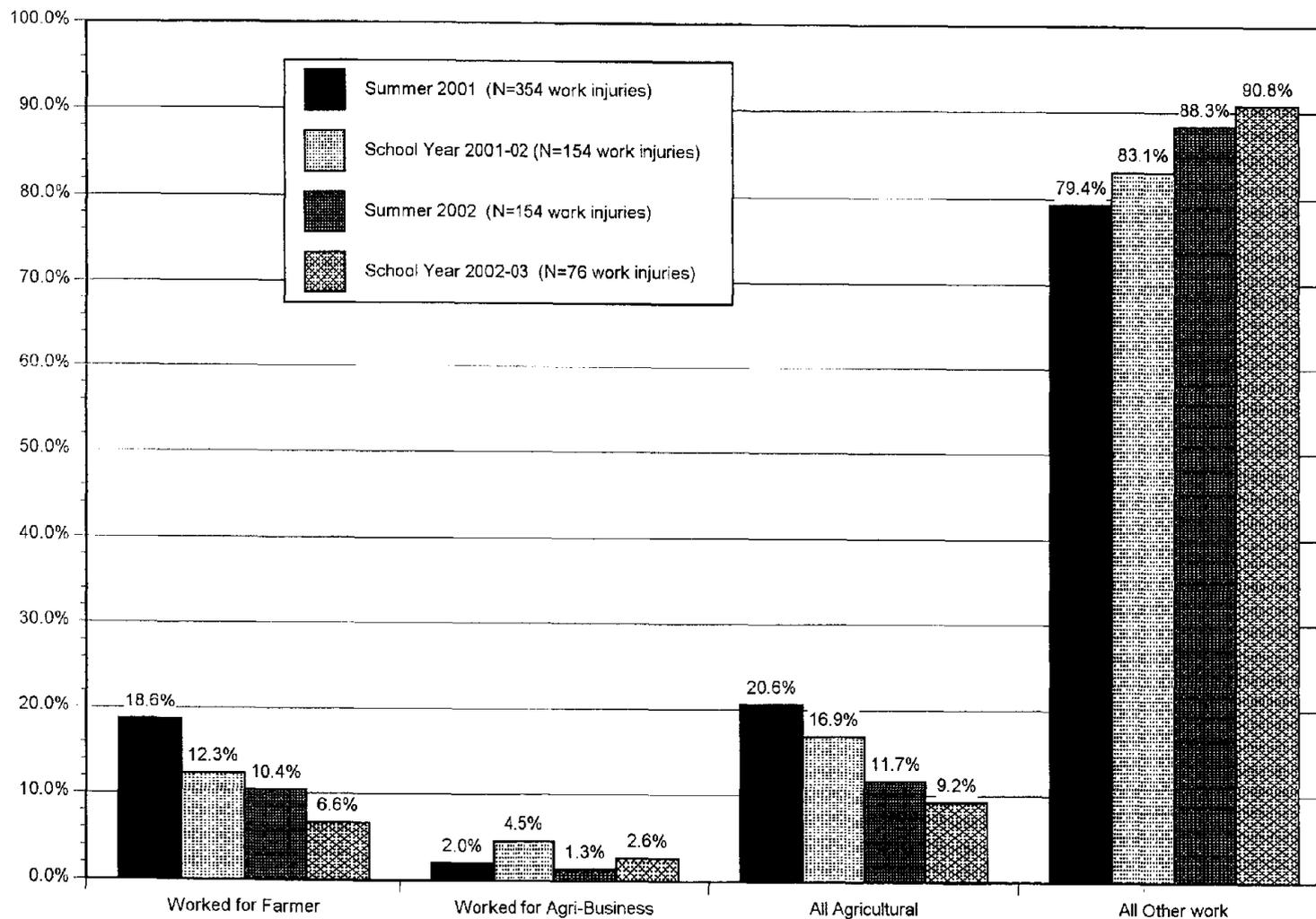


Figure 26. Proportion of Work-Related Injuries¹ Due to Agricultural Work vs. All Other Jobs.

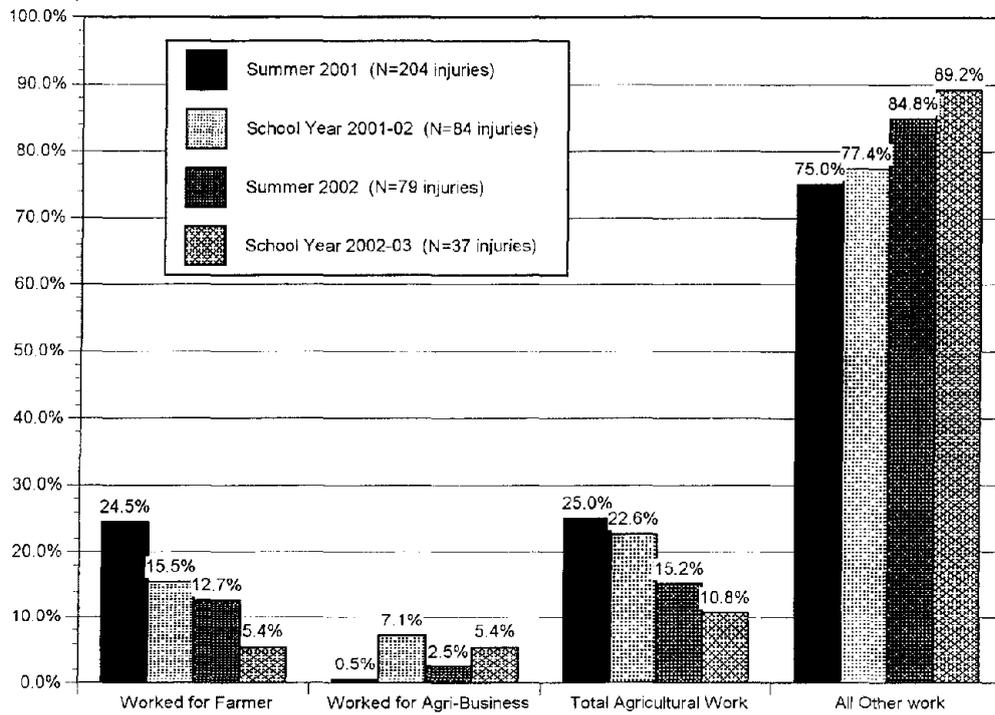
85



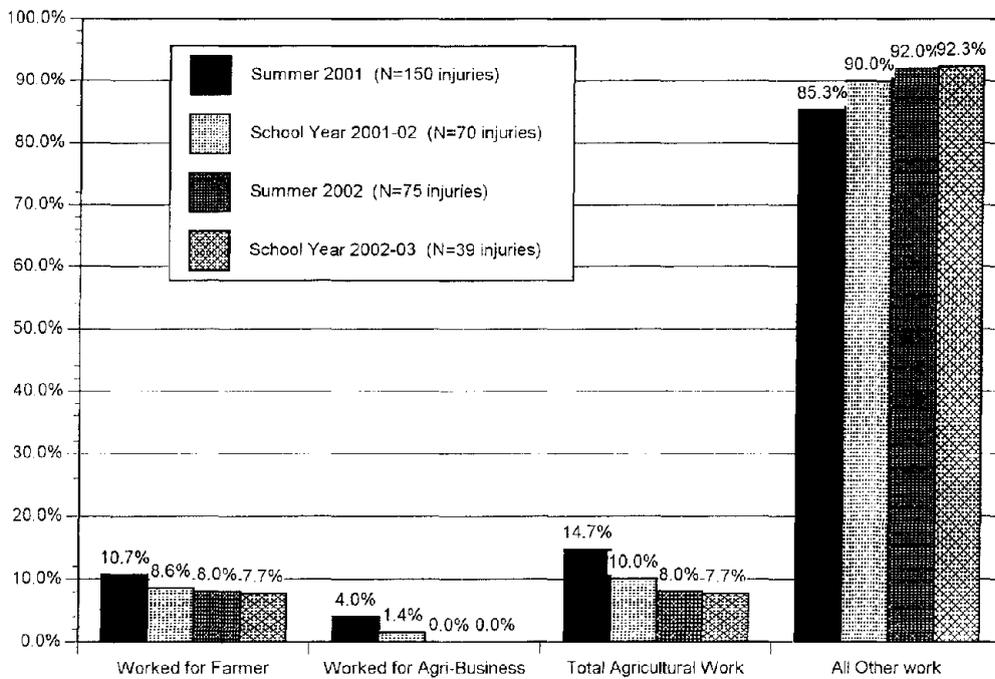
¹Includes injuries in which the location of injury was marked "work" and a job code was indicated with that injury.

Figure 27. Proportion of Work-Related Injuries¹ Due to Agriculture, by Gender.

a. Boys

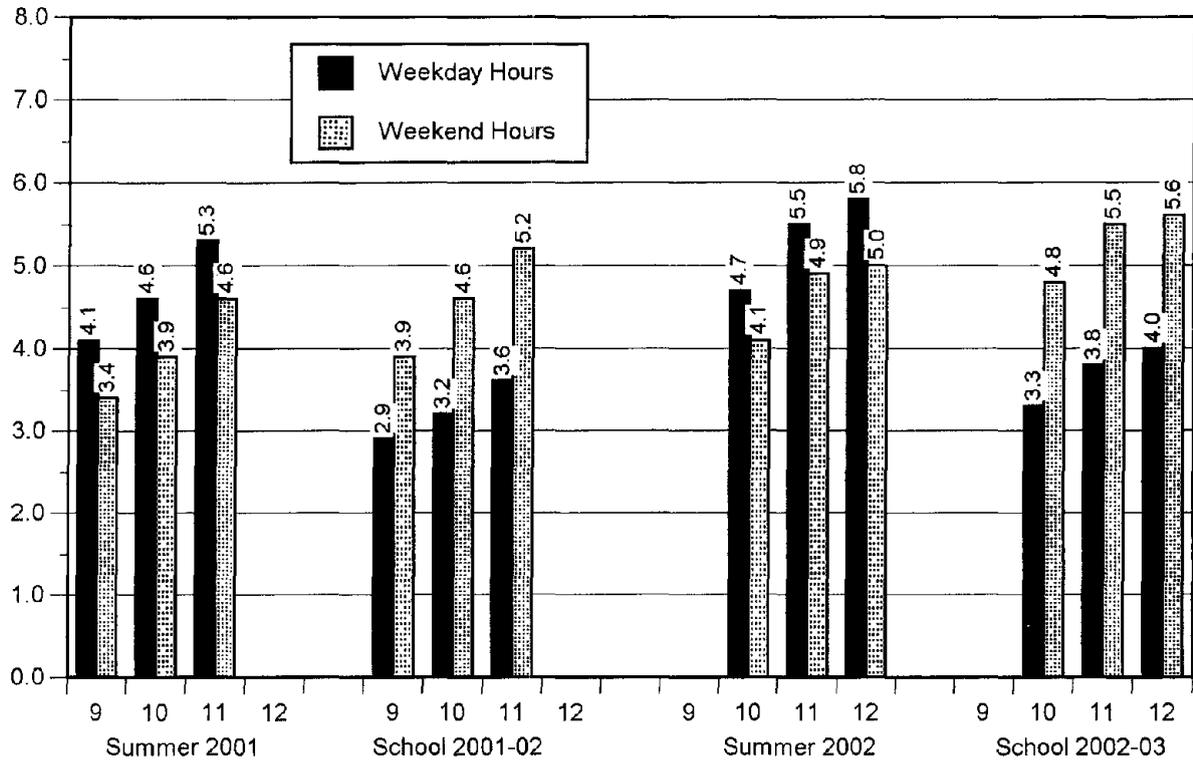


b. Girls



¹Includes injuries in which the location of injury was marked "work" and a job code was indicated with that injury.

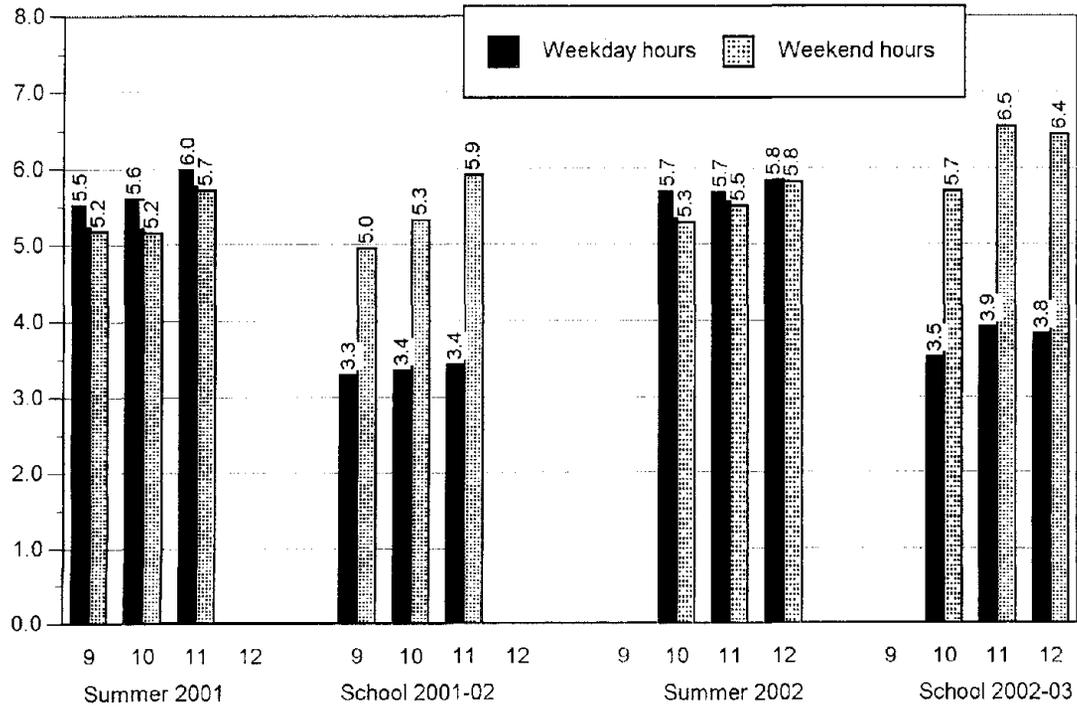
Figure 28. Mean “Typical” Work Hours Index¹ For All Jobs by Grade and Survey Period.



¹Survey questions did not ascertain weekly work hours, but only “typical” daily work hours. An index of work hours, to be used for internal comparisons within this dataset, was created by summing “typical” work hours for each job and dividing by the number of jobs. Average is only for those students who reported working. Limitations of this measure are described more fully in the text.

Figure 29. Mean “Typical” Work Hours Index¹ by Grade and Survey Period: Agricultural vs. Other Jobs

a. Worked for Farmer



b. Worked for Agri-business

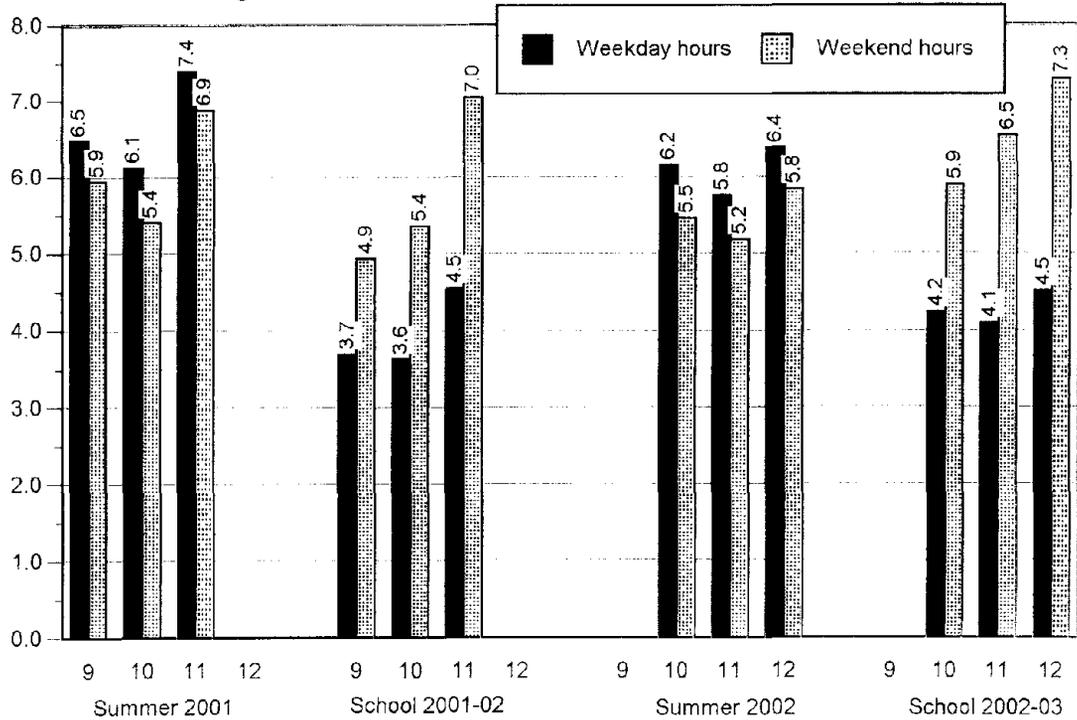
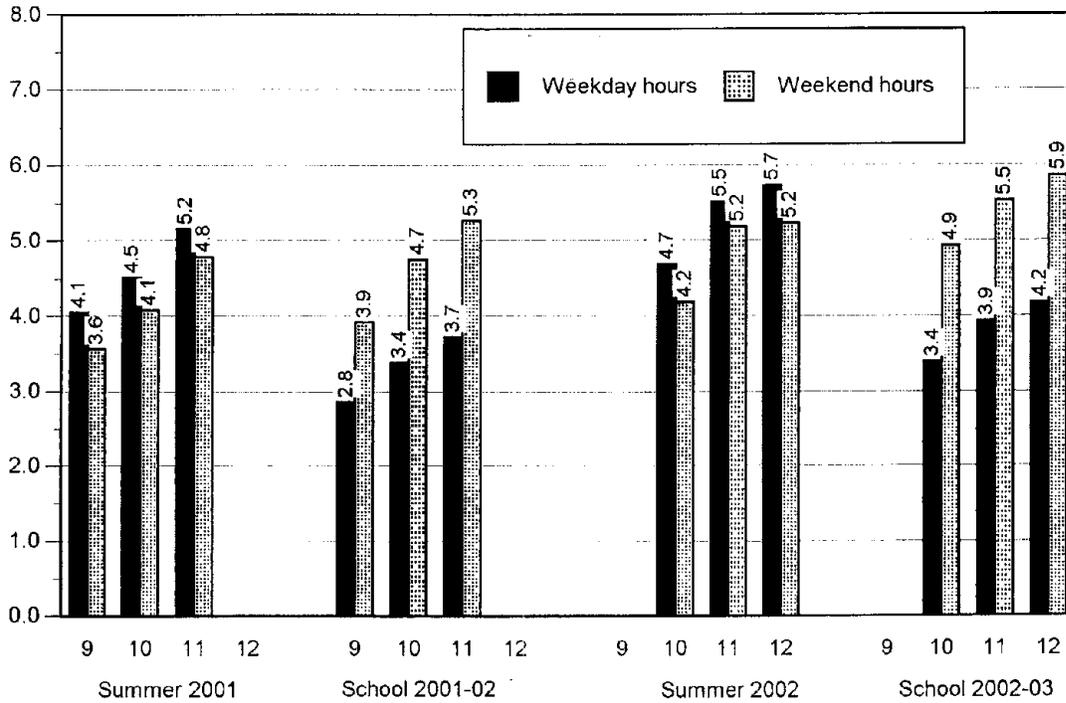


Figure 29 (continued)

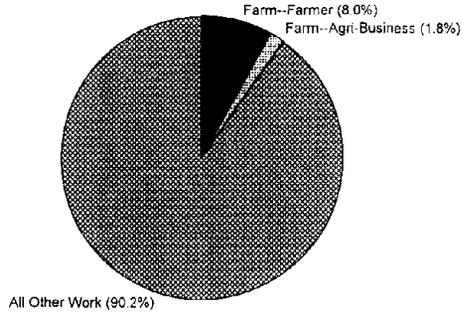
c. Worked in Non-Agricultural Jobs



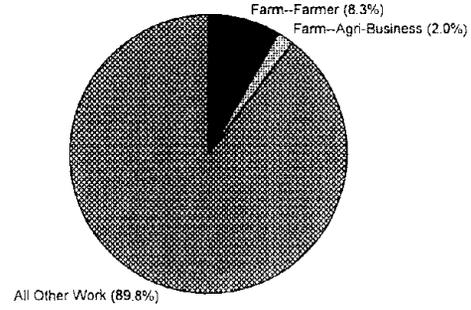
¹Survey questions did not ascertain weekly work hours, but only “typical” daily work hours. An index of work hours, to be used for internal comparisons within this dataset, was created by summing “typical” work hours for each job and dividing by the number of jobs. Average is only for those students who reported working. Limitations of this measure are described more fully in the text.

Figure 30. Proportion of Jobs Involved With Agriculture by Survey Period.

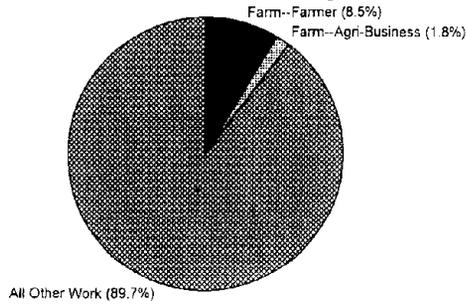
a. Summer 2001 (N=24512 jobs)



b. School Year 2001-02 (N=13931 jobs)



c. Summer 2002 (N=12496 jobs)



d. School Year 2002-03 (N=7540)

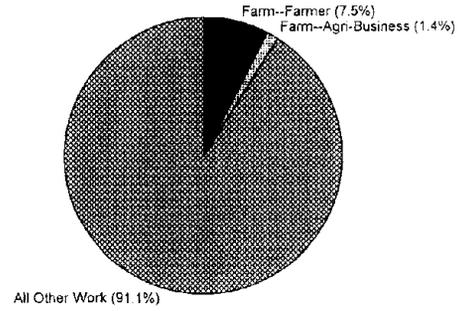
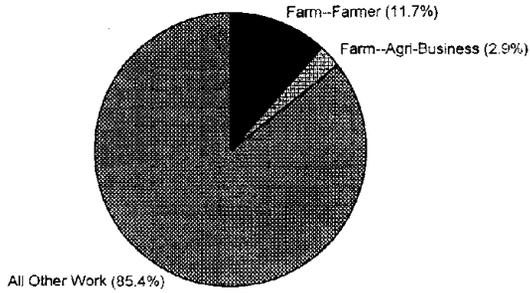
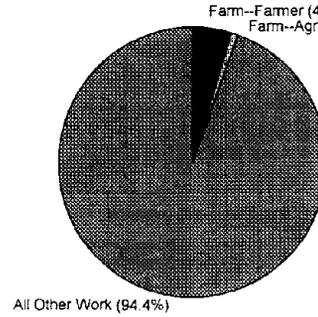


Figure 31. Proportion of Jobs Involved With Agriculture by Survey Period and Gender.

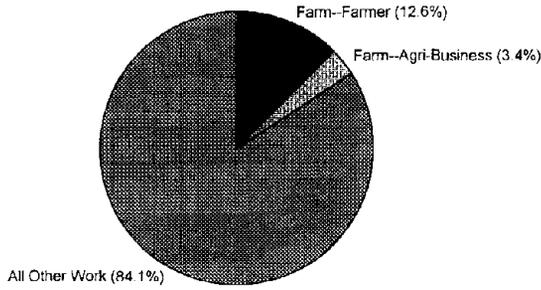
a. Boys, Summer 2001 (N=11614 jobs)



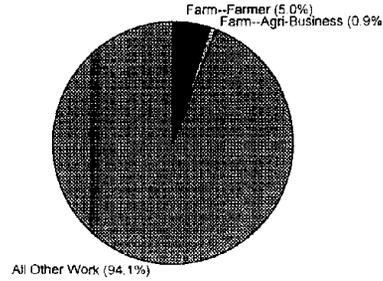
b. Girls, Summer 2001 (N=12883 jobs)



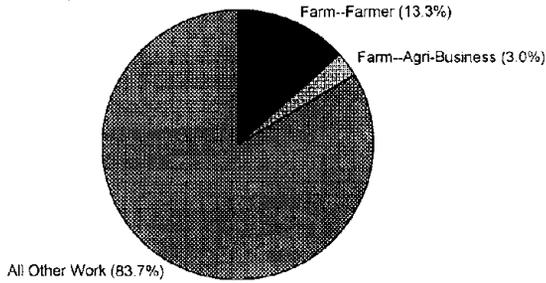
c. Boys, School Year 2001-02, (N=6034 jobs)



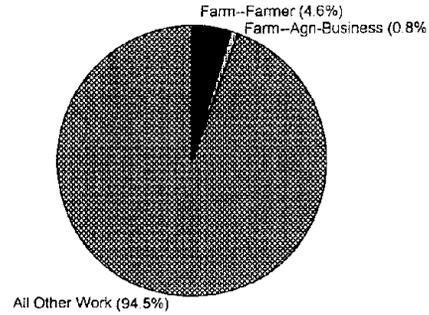
d. Girls, School Year 2001-02 (N=7873 jobs)



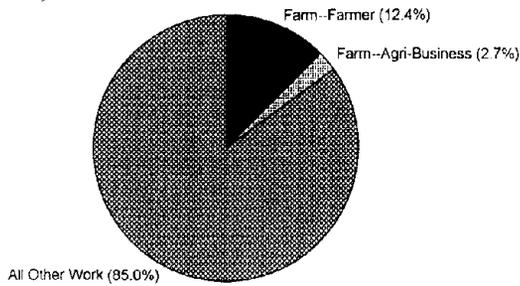
e. Boys, Summer 2002 (N=5603 jobs)



f. Girls, Summer 2002 (N=6887 jobs)



g. Boys, School Year 2002-03 (N=3004 jobs)



h. Girls, School Year 2002-03 (N=4530 jobs)

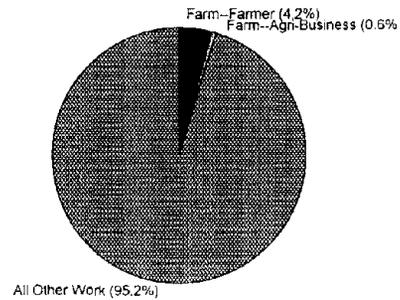
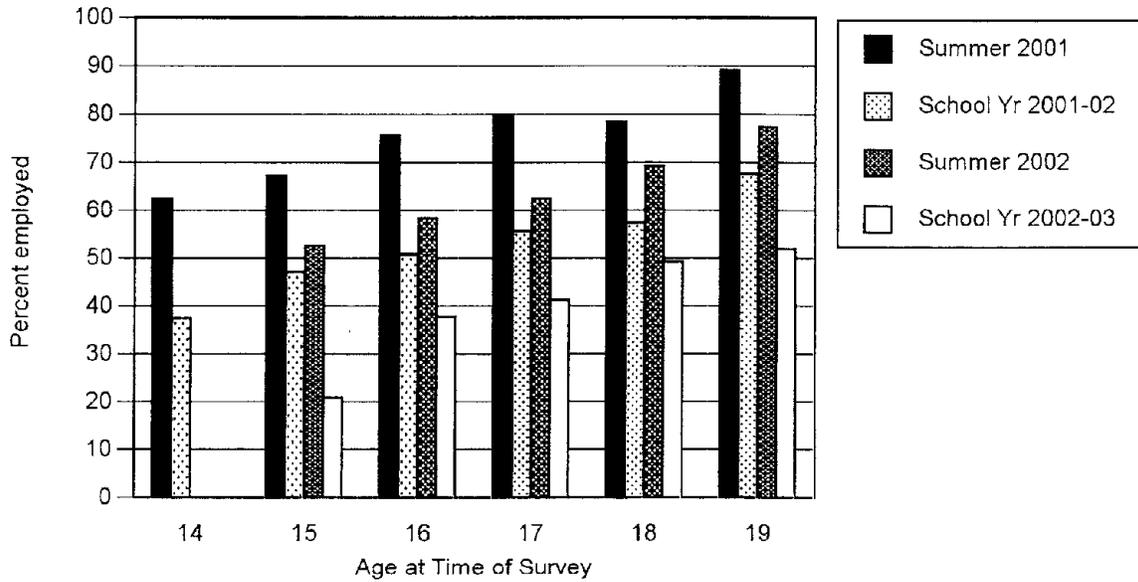


Figure 32. Percent of Youth Reporting Jobs by Age, Gender, and Survey Period.

a. Boys



b. Girls

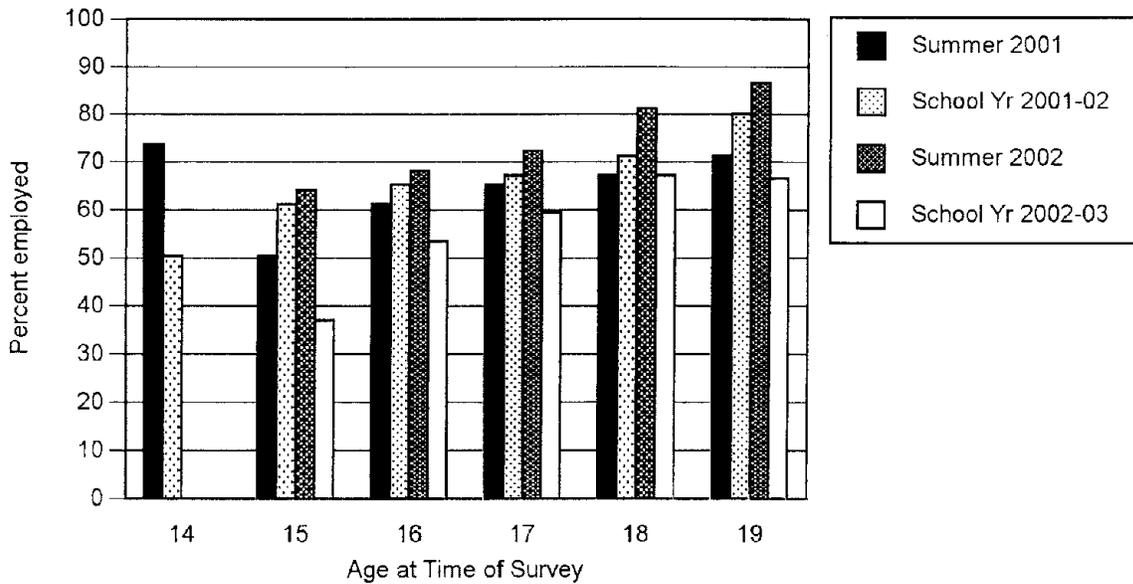


Figure 33. Proportion of Jobs Associated with a Work-Related Injury by Major Job Category and Survey Period.

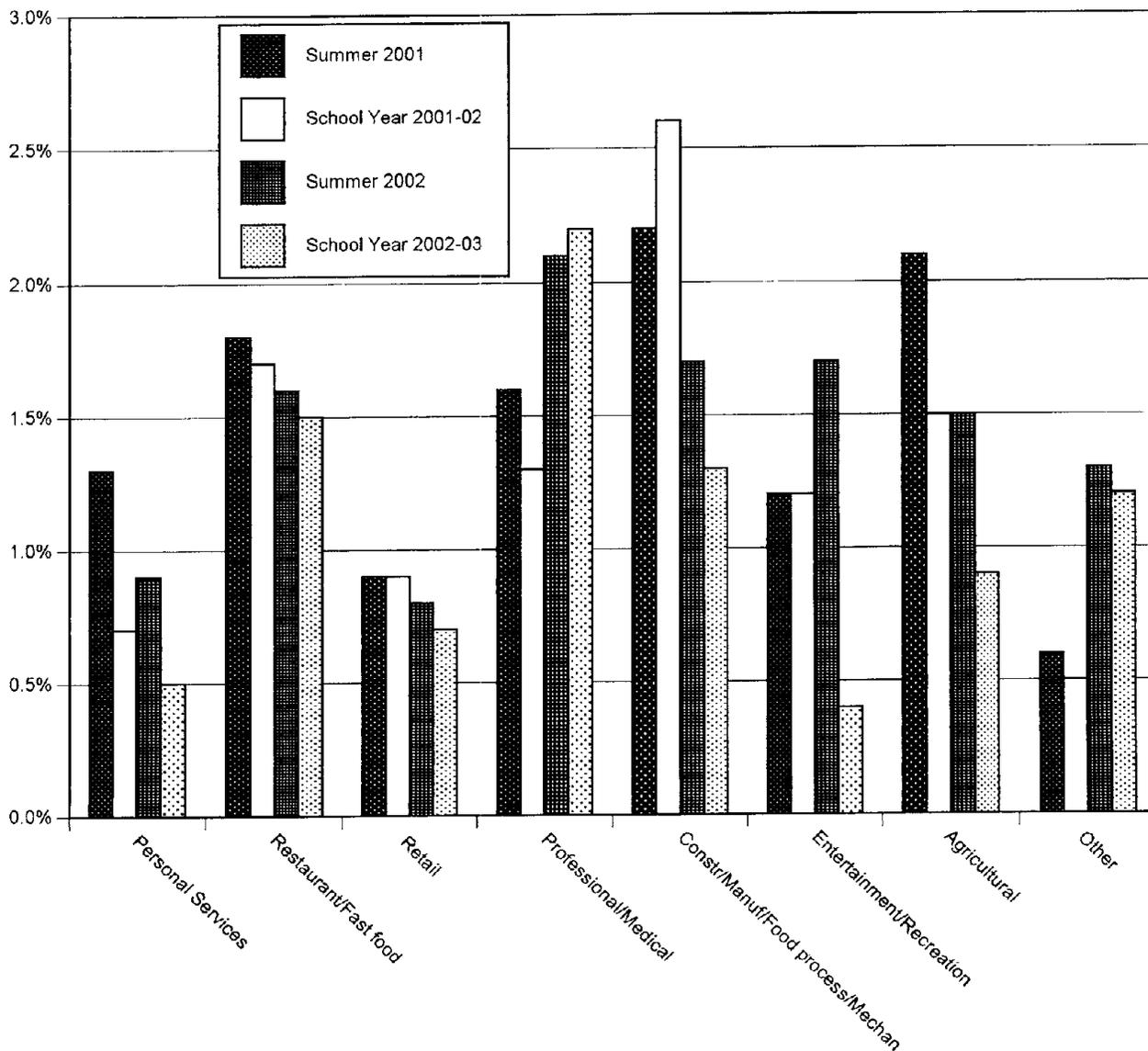
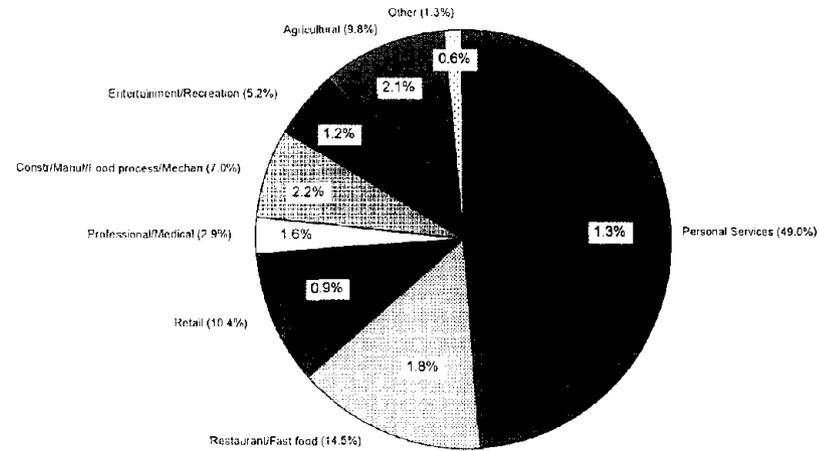
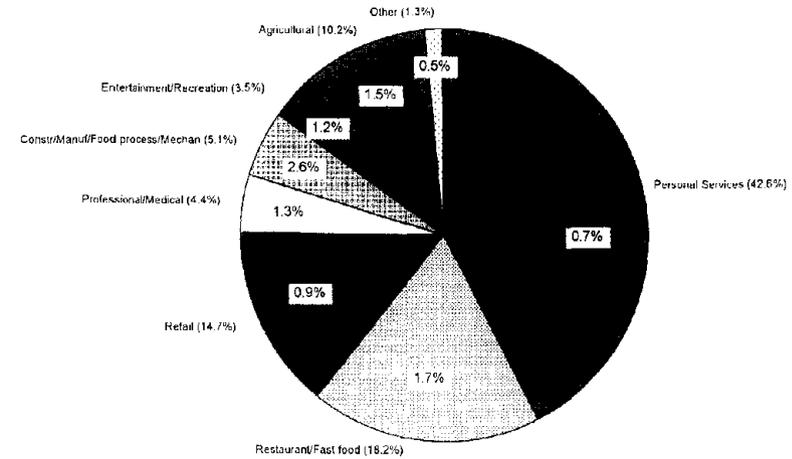


Figure 34. Proportion of Jobs Among Major Job Categories and Proportion of Jobs Associated with Injuries, by Survey Period (Injury Percents in Text Inserts Within Chart).

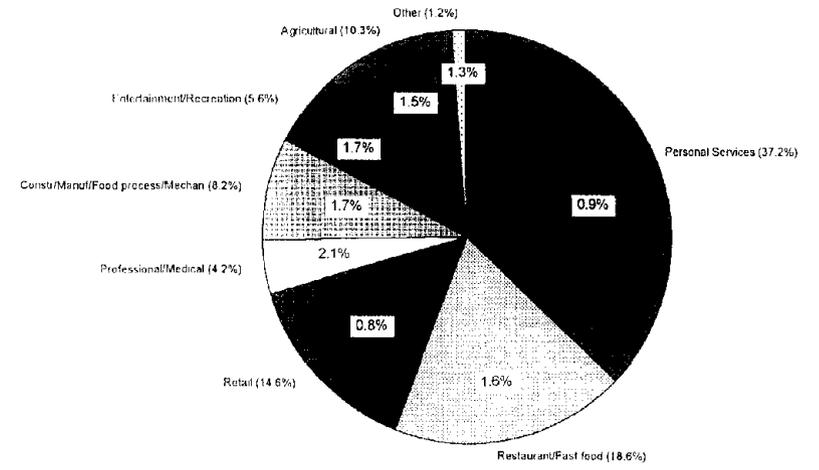
a. Summer 2001 (N=24511 jobs and 353 injuries)



b. School Year 2001-02 (N=13920 jobs and 156 injuries)



c. Summer 2002 (N= 12492 jobs and 154 injuries)



d. School Year 2002-03 (N= 7540 jobs and 63 injuries)

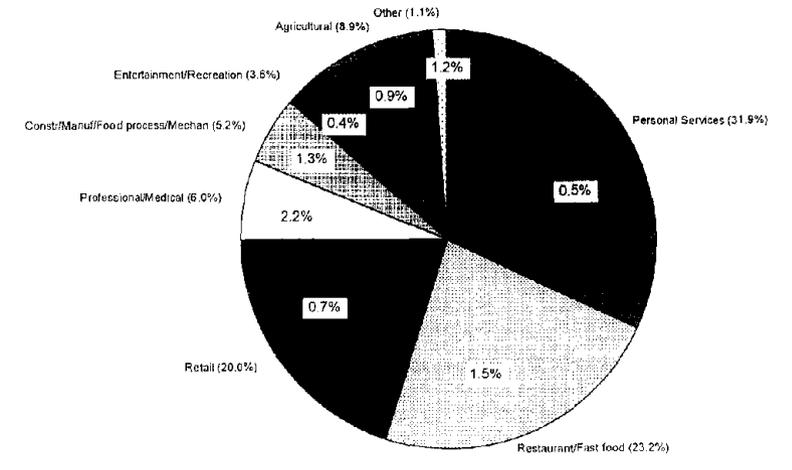
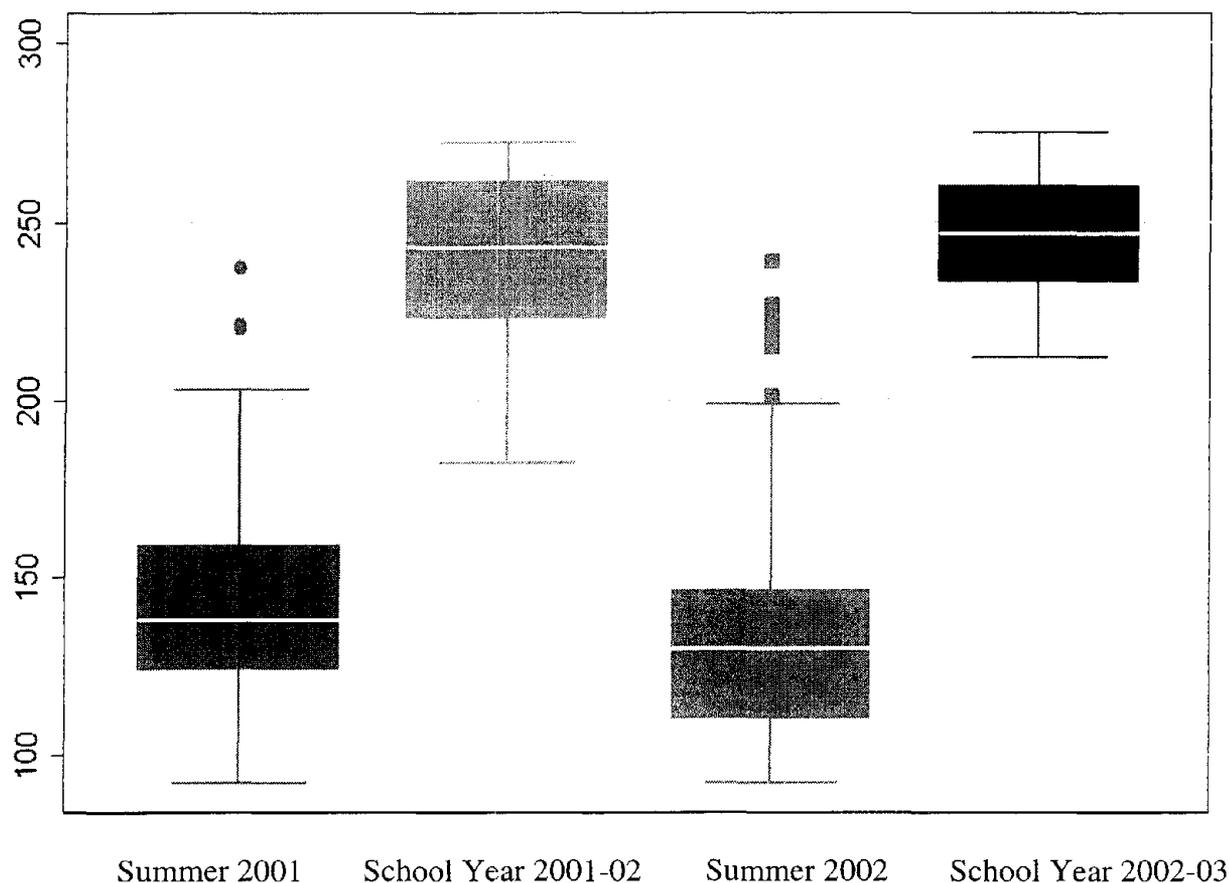


Figure 35. Distribution of Maximum Recall Periods¹ by Survey Period.



¹The maximum recall period is the time (in days) between when the survey was completed and the start of the period for which students were asked to recall events (June 1 for the two surveys covering summer events and September 1 for the two surveys covering events during the school year).

Table Key:

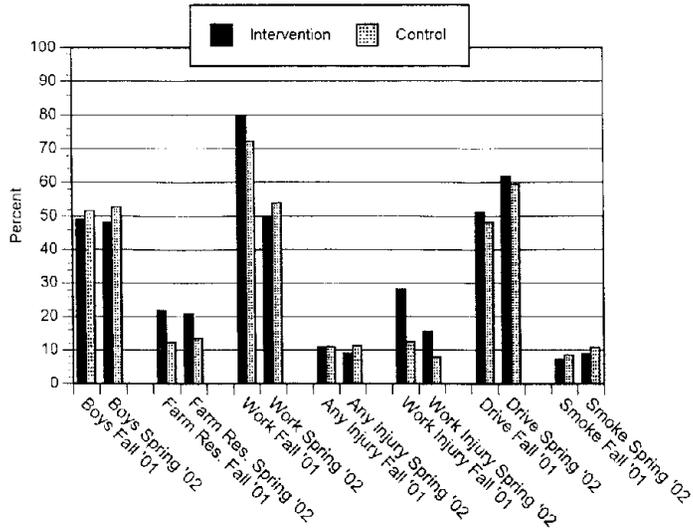
Thin lines indicate that 99% of the values fall within that range (outliers are shown as circles);

Black box indicates values between the 25 and 75 percentiles;

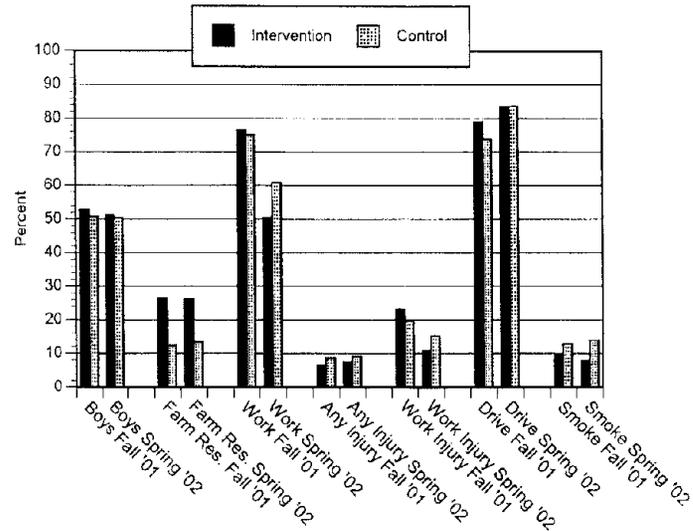
Thin white line in box represents the median of all observations.

Figure 36: Comparison of Selected Variables by WSWs Intervention Status and Grade.

a. Grade 9



b. Grade 10



c. Grade 11

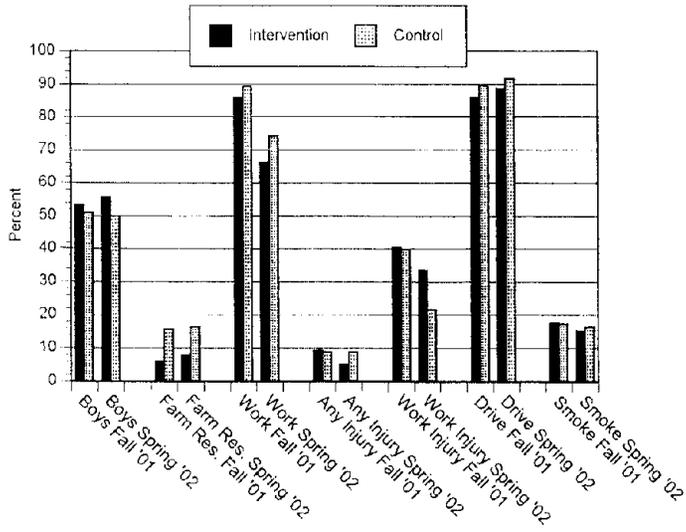


Table 1. Characteristics of Eligible Schools by Region and Size

	Region 1 Swine, Corn, & Soybeans	Region 2 Dairy and Poultry	Region 3 Forestry & Wild Rice	Region 4 Grains and Sugar Beets
Total Number of Students				
9 th Grade	6370	5369	4918	3382
10 th Grade	6234	5275	4873	3403
11 th Grade	5986	5095	4523	3289
12 th Grade	5878	5022	4291	3413
Total Number of Schools	54	47	43	46
Average Grade Size/School				
9 th Grade	118	114	114	74
10 th Grade	114	112	113	74
11 th Grade	111	108	105	72
12 th Grade	109	107	100	74
Number of Counties	19	11	14	23

*There are 87 counties in Minnesota, but this table only considers the 67 counties eligible for this study. Of the 20 ineligible counties, 17 are considered metropolitan areas by the U.S. Department of Agriculture Rural Continuum Code and three were considered ineligible because they were previous participants in the pilot test and in an injury surveillance survey.

Table 2. School Recruitment and Participation Status by Region and School Size.

School ID and Agricultural Region ¹	Random No.	First41 ²	Agr. Region	School Size ³	WSWS Status ⁴
REGION 1					
<i>Refusal</i>	0.01549	Y	1	1	
C-01	0.08879	Y	1	1	CNT (9)
I-04	0.10739	Y	1	1	INT (10)
C-04	0.13859	Y	1	1	CNT (10)
<i>Refusal</i>	0.16417	N	1	1	
<i>Refusal</i>	0.16846	N	1	1	
I-01	0.19579	N	1	1	INT (9)
(+ 19 more eligible)					
<i>Refusal</i>	0.05160	Y	1	2	
I-18	0.14372	Y	1	2	INT (9,10)
C-18	0.21444	Y	1	2	CNT ((9,10)
I-05	0.28546	Y	1	2	INT (10)
<i>Refusal</i>	0.29579	N	1	2	
C-05	0.31354	N	1	2	CNT (10)
(+ 14 more eligible)					
<i>Refusal</i>	0.01769	Y	1	3	
<i>Refusal</i>	0.02343	Y	1	3	
<i>Refusal</i>	0.05035	N	1	3	
I-13	0.05486	N	1	3	INT (11)
C-13	0.24748	N	1	3	CNT (11)
<i>Refusal</i>	0.48351	N	1	3	
(+2 more eligible)					
REGION 2					
C-17	0.03036	Y	2	1	CNT (10)
C-14	0.04996	Y	2	1	CNT (10)
I-17	0.09757	Y	2	1	INT (10)
I-14	0.21741	Y	2	1	INT (10)
(+ 19 more eligible)					
I-15	0.05052	Y	2	2	INT (9)
C-15	0.19235	Y	2	2	CNT (9)
I-07	0.20458	Y	2	2	INT (10)
<i>Refusal</i>	0.23817	Y	2	2	
C-07	0.26193	N	2	2	CNT (10)
(+ 12 more eligible)					
C-06	0.06570	Y	2	3	CNT (11)
<i>Refusal</i>	0.10511	Y	2	3	
<i>Refusal</i>	0.10918	N	2	3	
I-06	0.61968	N	2	3	INT (11)
<i>Refusal</i>	0.73608	N	2	3	
(+ 2 more eligible)					
REGION 3					

School ID and Agricultural Region ¹	Random No.	First41 ²	Agr. Region	School Size ³	WSWS Status ⁴
<i>Refusal</i>	0.03563	Y	3	1	
C-12	0.05922	Y	3	1	CNT (11)
C-20	0.10335	Y	3	1	CNT (10)
<i>Refusal</i>	0.12372	Y	3	1	
I-12	0.14739	N	3	1	INT (11)
(+ 18 more eligible)					
C-10	0.01271	Y	3	2	CNT (9)
I-08	0.19556	Y	3	2	INT (9)
C-08	0.19915	Y	3	2	CNT (9)
<i>Refusal</i>	0.22693	Y	3	2	
I-10	0.25037	N	3	2	INT (9)
(+ 11 more eligible)					
X-01	0.18141	Y	3	3	NA
C-19.	0.25088	Y	3	3	CNT (9)
<i>Refusal</i>	0.35530	N	3	3	
(+ 1 more eligible)					
REGION 4					
I-09	0.02425	Y	4	1	INT (10)
I-02	0.03519	Y	4	1	INT (9)
<i>Refusal</i>	0.04083	Y	4	1	
C-09.	0.05549	Y	4	1	CNT (10)
<i>Refusal</i>	0.12123	N	4	1	
C-02	0.28034	N	4	1	CNT (9)
X-02	0.33850	N	4	1	NA
(+ 10 more eligible)					
<i>Refusal</i>	0.01627	Y	4	2	
C-16.	0.03332	Y	4	2	CNT (10)
C-03	0.15600	Y	4	2	CNT (10)
<i>Refusal</i>	0.26854	Y	4	2	
I-16	0.37944	Y	4	2	INT (10)
<i>Refusal</i>	0.38297	N	4	2	
X-03	0.42949	N	4	2	NA
I-03.	0.43460	N	4	2	INT (10)
(+ 13 more eligible)					
C-11	0.12496	Y	4	3	CNT (9)
I-11	0.20035	Y	4	3	INT (9)
(+ 6 more eligible)					

¹Agricultural Region: counties were categorized into one of four agricultural regions; see Figure 1.

²First41 refers to the initial random sample of 41 schools selected for recruitment. Y=yes, N=no.

³School Size refers to three categories of school enrollment; 1=small (90-169), 2=medium (170-560), 3=large (561-1600).

⁴WSWS Status refers to participation in a concurrent group-randomized evaluation of the *Work Safe Work Smart* curriculum. INT=Intervention school, CNT=Control school, NA=school did not participate in the curriculum study. The number following the Status represents the grade participating in the curriculum evaluation during the Fall 2001-2002 school year. The CATES study included all students in grades 9, 10, 11 during the first year and grades 10,11 and 12 the second year

Table 3. Summary of Reasons Given by Schools for Declining to Participate

School Random No.	Region	Size	Visited	Reasons for Refusal
0.12123	4	1	no	They have too many things to do, too busy. They are losing both their principal and superintendent (same person).
0.16417	1	1	yes	Too many demands on teachers and at this time of year (May) the teachers just see things as extra work rather than as opportunities.
0.05035	1	3	no	Too busy
0.23817	2	2	no	Some previous bad experiences were mentioned.
0.10918	2	3	no	Terrible financial bind and were doing cuts and layoffs.
0.01549	1	1	yes	It just won't work out at this time – no specific reason
0.02343	1	3	yes	He had problems fitting the curriculum into their block schedule – just didn't work.
0.03563	3	1	no	No specific reason.
0.12372	3	1	yes	Although originally agreed to participate, declined before training due to budget cuts and layoffs.
0.05160	1	2	yes	He said that the teacher couldn't fit the curriculum in and yet the teacher talked with MDH and said it was fine, so???
0.01769	1	3	no	Too many surveys already being done.
0.48351	1	3	yes	No specific reason
0.26854	4	2	yes	I think we'll pass. He said that his teachers were already unhappy, class size decreasing, too many demands and no money.
0.22693	3	2	yes	Had to cut 1 million dollars out of their budget.
0.35530	3	3	yes	No specific reason
0.73608	2	3	yes	No specific reason.
0.29579	1	2	no	No specific reason
0.16846	1	1	no	No specific reason
0.38297	4	2	no	Too many surveys. Can't do another.
0.04083	4	1	yes	Principal was leaving, superintendent was first year and principal didn't want to even ask anyone because he was leaving.
0.01627	4	2	yes	Too many demands on the teachers. Couldn't handle any non-mandatory programs.
0.10511	2	3	no	Deep financial cuts and layoffs.

Table 4. Participation Rates by School for Initial Survey (Fall 2001)

School ID	Original Eligible ¹ (Surveys sent)	No Longer Enrolled	Revised Eligible	Total Surveys Completed	Completed Extras ²	Completed Surveys (less extras)	Participation Rate
01	292	0	292	281	0	281	96.2%
02	137	1	136	128	0	128	94.1%
03	125	5	120	109	0	109	90.8%
04	341	11	330	316	4	312	94.5%
05	252	1	251	247	8	239	95.2%
06	92	1	91	83	0	83	91.2%
07	229	1	228	176	0	176	77.2%
08	155	0	155	137	5	132	85.2%
09	272	0	272	264	11	253	93.0%
10	119	12	107	97	0	97	90.7%
11	172	0	172	162	0	162	94.2%
12	447	0	447	407	12	395	88.4%
13	96	0	96	94	0	94	97.9%
14	356	0	356	341	0	341	95.8%
15	91	0	91	75	0	75	82.4%
16	137	18	119	128	9	119	100.0%
17	522	29	493	475	0	475	96.3%
18	121	0	121	118	3	115	95.0%
19	510	12	498	471	19	452	90.8%
20	1747	36	1711	1397	19	1378	80.5%
21	219	0	219	204	0	204	93.2%
22	170	3	167	159	1	158	94.6%
23	1356	26	1330	1175	24	1151	86.5%
24	335	0	335	324	0	324	96.7%
25	357	0	357	334	2	332	93.0%
26	177	0	177	168	1	167	94.4%
27	298	0	298	275	1	274	91.9%
28	926	16	910	842	18	824	90.5%
29	190	0	190	180	0	180	94.7%
30	161	5	156	154	1	153	98.1%
31	146	2	144	142	2	140	97.2%
32	813	1	812	651	3	648	79.8%
33	239	5	234	234	4	230	98.3%
34	160	0	160	148	0	148	92.5%
35	234	0	234	213	1	212	90.6%
36	335	0	335	278	11	267	79.7%
37	1127	0	1127	999	1	998	88.6%
38	117	1	116	109	0	109	94.0%
40	126	13	113	115	3	112	99.1%
41	344	0	344	324	1	323	93.9%
42	1525	1	1524	1335	6	1329	87.2%
	15568	200	15368	13869	170	13699	89.1%

¹ Eligibles based on school rosters approximately one month prior to the start of school year

² Each school was provided with specially numbered "extra" unlabelled surveys for students not on original roster

Table 5. Completed Surveys by School, Grade, Survey Date

School ID	Fall 2001 Grades			Spring 2002 Grades			Fall 2002 Grades			Spring 2003 Grades		
	9	10	11	9	10	11	10	11	12	10	11	12
01	103	243	93		81	97	99		100	98	73	100
02	41	41	46	41	42	44	41	41	43	39	42	40
03	38	33	38	41	32	31	40	32	31	38	32	36
04	100	106	110	86	84	93	67	98	98	37	38	1
05	86	78	82	82	70	73	80	64	62	80	61	53
06	32	27	24	34	27	24	29	23		34	12	25
07	48	61	67	55	61	56	50	54	42	38	51	38
08	48	33	56	53	36	55	47	33	49	44	37	44
09	81	93	90	77	91	81	75	88	77	68	69	75
10	35	29	33	29	28	36	31	26	31			
11	53	64	45	53	63	49	53	60	36	49	56	36
12	141	135	131	139	127	127	143	129	112	125	120	95
13	29	29	36	29	27	34	28	29	32	26	27	34
14	123	105	113									
15	27	21	27	31	23	24	29	14	21	27	16	24
16	40	37	51	32	28	40	30	19	45	23	11	37
17	164	150	160	153	137	109	151	132	140	142	116	121
18	32	36	50	26	34	42	25	36	34	31	35	35
19	178	145	148	168	131	125	170	139	126	129	120	104
20 ¹	376	411	327	339	369	292						
21	76	64	64	73	62	64	68	53	57		40	44
22	53	60	46	50	60	46	49	58	46	48	52	36
23	378	423	373	357	346	289	367	341	246	313	299	207
24	97	126	101	67	102	78	76	102	66	67	93	46
25	112	107	115	99	99	88	88	99	88	84	58	99
26	55	58	55	47	54	57	52	55	58	52	56	58
27	91	95	89	87	90	88	79	77	79	83	76	75
28	290	243	309	280	226	224	266	216	222	212	187	189
29	62	49	69	52	48	55	57	37	57	47	31	52
30	50	62	42	50	17	40	49	52	34			
31	52	40	50	53	36	38	43	30	31	40	30	20
32	217	220	214	207	223	168						
33	81	70	83	77	63	74	70	49	71	74	54	69
34	52	42	54	48	41	47	44	36	41	44	37	43
35	71	78	64	66	74	62	72	71	60	72	65	53
36	87	83	108	93	95	102	82	95	108	63	79	86
37	307	340	351									
38	35	33	41	38	32	39	33	24	33	35	23	34
40	37	41	37	36	41	35	35	38	30	34	31	30
41	114	105	105	103	90	87	94	105	76	95	94	79
42	411	497	427		429	358	371	401	276	321	343	243

¹In this school surveys were inadvertently completed for seniors (grade 12) for Fall 2001 (N=278) and Spring 2002 (N=224).

Table 6: Recall Bias Survey Sample Selection and Participation

Agricultural Region/Size Stratum	Grade Selected	Number of expected students	Number of participating students¹
1. Region 1/ small	10	65	52
2. Region 1/medium	12	135	78
3. Region 2/small	12	40	29
4. Region 2/medium	10	110	93
	12	110	100
5. Region 3/small	11	60	35
6. Region 3/medium	11	130	88
7. Region 4/small	10	40	28
	11	40	22
8. Region 4/medium	10	60	44
<i>Total Students:</i>		790	569
	<i>Grade 10:</i>	275	242
	<i>Grade 11:</i>	230	145
	<i>Grade 12:</i>	285	207

¹Not all returned surveys could be used in this evaluation since some questionnaires could not be matched to the students' corresponding Spring surveys. Final matched surveys = 385.

Table 7. Participating Grades for 41 CATES Schools and 38 WWS¹ Curriculum Evaluation Schools, by WWS Status² and Time Period

School ID	WWS status ²	CATES Survey	WWS Pretest & Curricul. ³	CATES Survey	WWS Post1	CATES Survey	WWS Post2	CATES Survey	CATES Recall Survey (pop.)
		Fall 2001	Fall 2001	Spring 2002	Spring 2002	Fall 2002	Fall 2002	Spring 2003	Winter 2002-03
01	I	9,10,11	9,10	9,10,11	9,10	10,11,12	10,11	10,11,12	
02	I	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
03	I	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
04	I	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
05	I	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
06	I	9,10,11	10	9,10,11	10	10,12	11	10,11,12	
07	I	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
08	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
09	C	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
10	C	9,10,11	10	9,10,11	10	10,11,12	11	--	12 (29)
11	I	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
12	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
13	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
14	C	9,10,11	9	--	9	12	10	--	
15	C	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	10,11 (50)
16	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
17	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
18	I	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
19	I	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
20	C	9,10,11,12	9	9,10,11,12	9	--	--	--	
21	I	9,10,11	10	9,10,11	10	10,11,12	11	11,12	
22	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	10 (44)
23	I	9,10,11	11	9,10,11	11	10,11,12	12	10,11,12	
24	C	9,10,11	9,10	9,10,11	9,10	10,11,12	10,11	10,11,12	12 (74)
25	I	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
26	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	10 (53)
27	C	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	10,12 (194)
28	C	9,10,11	11	9,10,11	11	10,11,12	12	10,11,12	
29	C	9,10,11	11	9,10,11	11	10,11,12	12	10,11,12	11 (35)
30	I	9,10,11	10	9,10,11	10	10,11,12	11	11	
31	I	9,10,11	11	9,10,11	11	10,11,12	12	10,11,12	
32	C	9,10,11	11	9,10,11	11	--	--	--	
33	I	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
34	I	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
35	C	9,10,11	10	9,10,11	10	10,11,12	11	10,11,12	
36	C	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	11 (89)
37	I	9,10,11	11	--	11	--	--	--	
38	C	9,10,11	9	9,10,11	9	10,11,12	10	10,11,12	
40	X	9,10,11		9,10,11		10,11,12	--	10,11,12	
41	X	9,10,11		9,10,11		10,11,12	--	10,11,12	
42	X	9,10,11		10,11,12		10,11,12	--	10,11,12	

Table 7 footnotes (next page)

Table 7 footnotes

¹WSWS refers to the *Work Safe Work Smart* curriculum developed by the MDH and targeted to rural Minnesota youths who have both agricultural and non-agricultural employment. This curriculum was evaluated in a group-randomized trial that was conducted concurrently with the CATES surveys (both were NIOSH-funded projects that were initiated at the same time and rural schools were recruited for both projects under the “Youth at Work” label). With the exception of one WSWS intervention and one WSWS control school, only a single grade at each school participated in the WSWS study.

²Status:

C=WSWS Control school (N=20, only administered pretest and two post-tests to students in designated grades). WSWS pretest and two post-tests roughly corresponded with the dates of the first three CATES surveys.

I=WSWS Intervention school (N=18, taught the curriculum during the fall semester to designated grade, in addition to the pretest and two post-tests.

X=Did not participate in WSWS evaluation

³Shaded cells show grades in which students were exposed to the curriculum in fall semester 2001 and were thus potentially influenced in responding to subsequent CATES surveys

Table 8. Unadjusted Overall Responses from Student Surveys by Survey Period

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Surveys								
Date Survey Administered¹	Fall 2001		Spring 2002		Fall 2002		Spring 2003	
Schools/Students participating	41/13,869		39/10,945		38/9,073		35/7,802	
Participation Rate as Proportion of Initial Survey	100%		79%		65%		56%	
Participation Rate Among Schools Remaining in Study	89.1%		79%		78%		68%	
School Grades Surveyed ²	9 th -11 th		9 th -11 th		10 th -12 th		10 th -12 th	
Age at time of survey								
Missing	5	0.0	136	1.2	58	0.6	114	1.5
≤14	2891	20.9	1070	9.8	16	0.2	0	0.0
15	4517	32.6	3337	30.5	2271	25.0	84	1.1
16	4519	32.6	3670	33.5	3076	33.9	800	10.3
17	1782	12.9	2488	22.7	2810	31.0	2531	32.4
≥18 ²	155	1.1	244	2.2	842	9.3	4273	54.8
Gender								
Missing	100	0.7	207	1.9	76	0.8	129	1.7
Boy	7032	50.7	5459	49.9	4579	50.5	3838	49.2
Girl	6737	48.6	5279	48.2	4418	48.7	3835	49.2
Grade level								
Missing	9	0.1	168	1.5	92	1.0	148	1.9
9	4503	32.5	3450	31.5	0	0.0	0	0.0
10	4555	32.8	3719	34.0	3183	35.1	2716	34.8
11	4524	32.6	3471	31.7	3038	33.5	2572	33.0
12 ²	278	2.0	137	1.3	2760	30.4	2366	30.3
Ethnicity								
Missing	411	3.0	437	4.0	229	2.5	276	3.5
Non-Hispanic	13008	93.8	10137	92.6	8555	94.3	7272	93.2
Hispanic	450	3.2	371	3.4	289	3.2	254	3.3
Race								
Missing	262	1.9	364	3.3	137	1.5	172	2.2
African American/Black	132	1.0	132	1.2	111	1.2	87	1.1
American Indian/Alaskan Native	215	1.6	140	1.3	78	0.9	55	0.7
Other/Mixed	225	1.6	145	1.3	113	1.3	99	1.3
Asian	163	1.2	133	1.2	25	0.3	245	3.1
Native Hawaiian/Pacific Islander	30	0.2	29	0.3	305	3.4	28	0.4
White/Caucasian	12842	92.6	10002	91.4	8304	91.5	7116	91.2
Farm residence								
Missing	254	1.8	344	3.1	159	1.8	196	2.5
No	11764	84.8	9017	82.4	7624	84.0	6545	83.9
Yes	1851	13.4	1584	14.5	1290	14.2	1061	13.6
Farm type								

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Beef cattle	640	4.6	557	5.1	447	4.9	401	5.1
Hogs	342	2.5	321	2.9	302	3.3	224	2.9
Row crops (corn, soybeans, sugar beets)	1068	7.7	908	8.3	787	8.7	628	8.1
Dairy	311	2.2	251	2.3	207	2.3	177	2.3
Small grains	269	1.9	262	2.4	214	2.4	190	2.4
Turkeys, poultry	125	0.9	127	1.2	94	1.0	71	0.9
Sheep, goats	56	0.4	59	0.5	40	0.4	34	0.4
Horse	30	0.2	61	0.6	38	0.4	31	0.4
Other animal	12	0.1	19	0.2	24	0.3	25	0.3
Hay, alfalfa	2	0.0	29	0.3	18	0.2	9	0.1
Hand harvested	11	0.1	21	0.2	10	0.1	14	0.2
Other farm type	130	0.9	30	0.3	28	0.3	21	0.3
Missing type	24	0.2	19	0.2	17	0.2	15	0.2
Attend school during survey period								
Missing	410	3.0	0	0.0	220	2.4	0	0.0
No	12328	88.9	357	3.3	8318	91.7	216	2.8
Yes	1131	8.2	10588	96.7	535	5.9	7586	97.2
Hours in school								
N	13325		10010		8777		7003	
Mean	0.33		7.69		0.21		7.60	
S.D.	1.36		1.23		1.08		1.45	
Homework hours								
N	1732		10493		861		7248	
Mean	0.90		1.52		1.06		1.36	
S.D.	1.58		1.43		1.82		1.40	
Weeknight hours of sleep								
N	13645		10626		8904		7569	
Mean	8.83		7.69		8.45		7.50	
S.D.	1.90		1.53		1.99		1.64	
Weekend hours of sleep								
N	13625		10605		8878		7553	
Mean	8.39		8.25		8.13		7.90	
S.D.	2.30		2.40		2.40		2.44	
Weekday hours driving/driven to/from school								
N	13576		10590		8873		7560	
Mean	1.43		1.70		1.64		1.73	
S.D.	2.37		2.40		2.51		2.66	
Weekend hours driving/driven to/from school								
N	13629		10613		8904		7567	

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Mean	1.13		1.41		1.35		1.56	
S.D.	2.07		2.32		2.33		2.67	
Hours/day in supervised/organized sports								
N	13657		10619		8902		7554	
Mean	1.66		1.88		1.49		1.80	
S.D.	2.44		2.18		2.37		2.47	
Hours/day in unsupervised/recreat. sports								
N	13637		10613		8902		7545	
Mean	2.86		1.88		2.32		1.74	
S.D.	3.06		2.34		2.87		2.58	
Worked during survey period								
Missing	214	1.5	364	3.3	212	2.3	267	3.4
No	2669	19.2	3824	34.9	2490	27.4	3326	42.6
Yes	10986	79.2	6757	61.7	6371	70.2	4209	54.0
Number of jobs worked								
Missing	214	1.5	364	3.3	212	2.3	267	3.4
0	2863	20.6	4016	36.7	2671	29.4	3486	44.7
1	3205	23.1	2353	21.5	2405	26.5	1887	24.2
2	3469	25.0	2080	19.0	2024	22.3	1228	15.7
3	2103	15.2	1110	10.1	1001	11.0	539	6.9
4	2015	14.5	1022	9.3	760	8.4	395	5.1
Mean # of jobs	1.80		1.32		1.41		1.00	
Job Descriptions (any job, by person)								
<i>Personal Services</i>	7757	55.9	4025	36.8	3355	37.0	1820	23.3
Lawn Care	4448	32.1	1722	15.7	1726	19.0	606	7.8
Babysitting	4175	30.1	2364	21.6	1602	17.7	961	12.3
Maid/Housekeeper	1397	10.1	755	6.9	530	5.8	326	4.2
Clean/Janitorial	1040	7.5	590	5.4	393	4.3	263	3.4
Day Care/Child Care	319	2.3	158	1.4	154	1.7	115	1.5
Delivery person	223	1.6	140	1.3	101	1.1	68	0.9
Car wash worker	245	1.8	132	1.2	91	1.0	47	0.6
<i>Restaurant/Fast Food</i>	2725	19.6	1913	17.5	1750	19.3	1328	17.0
Car hop/Fast food server	465	3.4	339	3.1	263	2.9	207	2.7
Cook-Fast food	897	6.5	691	6.3	678	7.5	513	6.6
Wait person	597	4.3	451	4.1	449	4.9	396	5.1
Buser	334	2.4	208	1.9	199	2.2	137	1.8
Dishwasher	1006	7.3	645	5.9	522	5.8	362	4.6
Host/hostess	210	1.5	159	1.5	174	1.9	116	1.5

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
<i>Retail</i>	2085	15.0	1638	15.0	1526	16.8	1239	15.9
Cashier	1322	9.5	1086	9.9	1023	11.3	844	10.8
Stock Clerk	364	2.6	247	2.3	259	2.9	205	2.6
Sales clerk	330	2.4	273	2.5	255	2.8	231	3.0
Station attendant	92	0.7	90	0.8	81	0.9	56	0.7
Grocery bagger	400	2.9	327	3.0	202	2.2	158	2.0
<i>Professional/Medical</i>	666	4.8	578	5.3	500	5.5	430	5.5
Vet's helper	66	0.5	39	0.4	34	0.4	30	0.4
Teacher/Aide	48	0.3	98	0.9	24	0.3	52	0.7
Orderly/Nursing home/PCA	207	1.5	221	2.0	215	2.4	199	2.6
Receptionist/Office	230	1.7	159	1.5	158	1.7	124	1.6
Computer Op/Programmer	107	0.8	82	0.7	59	0.7	32	0.4
Small animal related	31	0.2	8	0.1	13	0.1	2	0.0
Lab or Pharm tech	3	0.0	3	0.0	15	0.2	4	0.1
<i>Construction/manufacturing/food processing</i>	1577	11.4	661	6.0	955	10.5	372	4.8
Laborer	1481	10.7	602	5.5	876	9.7	336	4.3
Line worker	137	1.0	71	0.6	99	1.1	41	0.5
<i>Entertainment/recreation</i>	1150	8.3	455	4.2	656	7.2	262	3.4
Amusement park Attend.	108	0.8	55	0.5	74	0.8	36	0.5
Lifeguard	260	1.9	124	1.1	226	2.5	102	1.3
Recreation/Camp cnslr./sports instr.	437	3.2	147	1.3	223	2.5	80	1.0
Dockhand	99	0.7	40	0.4	48	0.5	18	0.2
Special events	339	2.4	117	1.1	116	1.3	37	0.5
<i>Agricultural</i>	2102	15.2	1243	11.4	1152	12.7	609	7.8
Farm--farmer	1873	13.5	1120	10.2	1044	11.5	556	7.1
Farm--agribusiness	438	3.2	269	2.5	224	2.5	107	1.4
<i>Other</i>	281	2.0	164	1.5	136	1.5	79	1.0
Employed – Broad categories by Gender (any job, by person)								
<i>Personal Services</i>	7757	55.9	4025	36.8	3355	37.0	1820	23.3
Males	3388	48.2	1532	28.1	1368	29.9	611	15.9
Females	4364	64.8	2491	47.2	1984	44.9	1209	31.5
<i>Restaurant/Fast Food</i>	2725	19.6	1913	17.5	1750	19.3	1328	17.0
Males	1145	16.3	737	13.5	641	14.0	435	11.3

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Females	1580	23.5	1170	22.2	1109	25.1	892	23.3
<i>Retail</i>	2085	15.0	1638	15.0	1526	16.8	1239	15.9
Males	966	13.7	717	13.1	596	13.0	481	12.5
Females	1118	16.6	916	17.4	930	21.1	757	19.7
<i>Professional Medical</i>	666	4.8	578	5.3	500	5.5	430	5.5
Males	189	2.7	142	2.6	120	2.6	80	2.1
Females	476	7.1	434	8.2	379	8.6	350	9.1
<i>Construction/manufacturing/food processing</i>	1577	11.4	661	6.0	955	10.5	372	4.8
Males	1377	19.6	571	10.5	840	18.3	325	8.5
Females	197	2.9	87	1.6	115	2.6	47	1.2
<i>Entertainment/Recreation</i>	1150	8.3	455	4.2	656	7.2	262	3.4
Males	503	7.2	200	3.7	263	5.7	96	2.5
Females	644	9.6	253	4.8	392	8.9	165	4.3
<i>Agricultural activities</i>	2102	15.2	1243	11.4	1152	12.7	609	7.8
Males	1430	20.3	816	14.9	799	17.4	404	10.5
Females	671	10.0	426	8.1	352	8.0	205	5.3
<i>Other</i>	281	2.0	164	1.5	136	1.5	79	1.0
Males	172	2.4	80	1.5	74	1.6	52	1.4
Females	109	1.6	84	1.6	62	1.4	27	0.7
Missing								
Weekday average hours worked								
Job 1	5.04		3.57		5.70		4.05	
Job 2	4.57		3.46		4.99		3.74	
Job 3	4.35		3.35		4.78		3.71	
Job 4	4.47		3.56		4.95		4.11	
Weekend average hours worked								
Job 1	4.77		5.20		5.40		5.86	
Job 2	4.43		4.62		4.94		5.27	
Job 3	4.13		4.46		4.66		4.98	
Job 4	4.24		4.51		4.87		5.21	
Average duration of work (weeks)								
Job 1	11.10		23.75		11.25		24.96	
Job 2	10.71		23.70		11.04		24.46	

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Job 3	10.70		23.73		11.35		25.56	
Job 4	10.58		23.89		11.32		25.51	
Performed job tasks involving (any jobs)								
drive tractor/combine	1839	13.3	1162	10.6	1121	12.4	593	7.6
truck driver products	721	5.2	627	5.7	650	7.2	395	5.1
repair/maintain machinery	1801	13.0	1171	10.7	1147	12.6	653	8.4
bail/stack hay	1601	11.5	1021	9.3	919	10.1	484	6.2
hand harvest fruits/veg	700	5.1	413	3.8	390	4.3	196	2.5
hoe, pick rocks, cut weeds	2442	17.6	1350	12.3	1237	13.6	589	7.6
livestock chores	1439	10.4	992	9.1	817	9.0	475	6.1
milk cows	506	3.7	401	3.7	304	3.4	198	2.5
build fences	1203	8.7	825	7.5	721	8.0	398	5.1
clean livestock barns/pens	1253	9.0	901	8.2	755	8.3	441	5.7
move animals	1207	8.7	908	8.3	755	8.3	448	5.7
breeding animals	447	3.2	374	3.4	297	3.3	210	2.7
pesticide appl/tend spray trucks	374	2.7	330	3.0	312	3.4	181	2.3
detasseling	200	1.4	144	1.3	115	1.3	60	0.8
custom/crew hand harvesting	204	1.5	162	1.5	129	1.4	77	1.0
custom/crew machine harvesting	388	2.8	311	2.8	254	2.8	139	1.8
poultry catching	311	2.2	235	2.2	192	2.1	101	1.3
building cleaning	1603	11.6	962	8.8	927	10.2	553	7.1
manure pumping	379	2.7	336	3.1	249	2.7	189	2.4
landscaping	1812	13.1	957	8.7	1030	11.4	453	5.8
Work included this activity (any job)								
operate power machine (except motor vehicle)	3311	23.9	1809	16.5	1867	20.6	958	12.3
operate power hand tools	3350	24.2	1885	17.2	2005	22.1	1100	14.1
operate non-power hand tools	4342	31.3	2683	24.5	2642	29.1	1633	20.9
lifting/bending/twisting	5332	38.5	3454	31.6	3465	38.2	2214	28.4
using chemicals	2313	16.7	1658	15.2	1730	19.1	1161	14.9
drive car or truck	2670	19.3	1798	16.4	1966	21.7	1143	14.7
work with animals	1876	13.5	1291	11.8	1036	11.4	630	8.1
climbing/working from heights	2239	16.1	1411	12.9	1545	17.0	886	11.4
work around hot surface	3841	27.7	2613	23.9	2484	27.4	1751	22.4
Reported Injury								
Missing	713	5.1	733	6.7	419	4.6	436	5.6
No	11580	83.5	9091	83.1	8133	89.6	6917	88.7
Yes	1228	8.9	953	8.7	431	4.8	376	4.8

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Yes, not by definition	348	2.5	168	1.5	90	1.0	73	0.9
Number of reported injuries (up to 4)								
Missing	713	5.1	733	6.7	419	4.6	436	5.6
0	12097	87.2	9379	85.7	8306	91.6	7032	90.1
1	690	5.0	524	4.8	246	2.7	240	3.1
2	204	1.5	181	1.7	58	0.6	49	0.6
3	65	0.5	64	0.6	25	0.3	16	0.2
4	100	0.7	64	0.6	19	0.2	29	0.4
Average # of injuries	0.13		0.13		0.06		0.07	
Location of injury (students who had at least one injury at that location)								
Work/Chore	266	1.9	130	1.2	122	1.3	65	0.8
School	95	0.7	240	2.2	25	0.3	102	1.3
Other activity	784	5.6	546	5.0	225	2.5	198	2.5
Location of injury (distribution among all reported injuries with known location)								
Work/Chore	378	22.1	171	12.8	169	32.4	90	17.8
School	118	6.9	339	25.3	30	5.8	153	30.2
Other activity	1209	70.9	828	61.9	322	61.8	264	52.1
Any injury involving agricultural work								
Among working students only	59	0.5	23	0.3	18	0.3	5	0.1
Working Boys	43	0.8	16	0.5	12	0.4	2	0.1
Working Girls	16	0.3	7	0.2	6	0.2	3	0.1
Working students, by Grade Level								
Grade 9	14	0.4	7	0.4				
Grade 10	16	0.5	8	0.4	8	0.4	3	0.2
Grade 11	28	0.7	8	0.3	3	0.1	0	0
Grade 12					7	0.3	2	0.1
Working Students, by Farm Residence								
Reside on Farm	39	2.4	16	1.3	15	1.4	4	0.6
Not Reside on Farm	19	0.2	7	0.1	3	0.1	1	<0.1
Body parts injured (all injuries)								
face/nose	169	1.2	101	0.9	70	0.8	56	0.7
eyelid/eye	79	0.6	54	0.5	48	0.5	40	0.5
head/scalp	166	1.2	129	1.2	65	0.7	58	0.7
teeth	62	0.5	52	0.5	36	0.4	37	0.5

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
shoulder	253	1.8	157	1.4	89	1.0	75	1.0
arm/elbow	372	2.7	196	1.8	96	1.1	84	1.1
wrist/hand/finger	680	4.9	377	3.4	211	2.3	139	1.8
upper back/neck	204	1.5	142	1.3	88	1.0	65	0.8
mid/lower back	332	2.4	223	2.0	128	1.4	90	1.2
hip/leg	384	2.8	302	2.8	128	1.4	122	1.6
ankle/foot/toe	504	3.6	328	3.0	140	1.5	106	1.4
lungs	58	0.4	40	0.4	30	0.3	29	0.4
ribs/chest	126	0.9	94	0.9	51	0.6	33	0.4
abdomen/groin	94	0.7	66	0.6	50	0.6	45	0.6
bruise/abrasion	413	3.0	246	2.3	145	1.6	87	1.1
cut	558	4.0	247	2.3	180	2.0	98	1.3
burn	320	2.3	163	1.5	133	1.5	63	0.8
concussion/loss of consciousness	108	0.8	103	0.9	56	0.6	49	0.6
bite/sting	105	0.8	47	0.4	45	0.5	30	0.4
strain/sprain	600	4.3	472	4.3	177	2.0	175	2.2
fracture/dislocation	317	2.3	302	2.8	123	1.4	120	1.5
chemical exposure	63	0.5	46	0.4	42	0.5	36	0.5
other	347	2.5	251	2.3	128	1.4	106	1.4
Who treated injury (all injuries)								
physician	490	3.5	467	4.3	194	2.1	185	2.4
nurse/nurse pract/phys.assist	340	2.5	266	2.4	130	1.4	113	1.5
chiropracter	195	1.4	189	1.7	87	1.0	72	0.9
dentist	42	0.3	43	0.4	39	0.4	22	0.3
physical therapist	177	1.3	178	1.6	76	0.8	106	1.4
no professional treatment	853	6.2	469	4.3	243	2.7	156	2.0
none	1211	8.7	840	7.7	371	4.1	302	3.9
Any permanent disabilities (all injuries)								
limited use of hands/fingers	58	0.4	52	0.5	37	0.4	19	0.2
loss of all/part of fingers	25	0.2	26	0.2	23	0.3	17	0.2
loss of hand(s)	27	0.2	25	0.2	24	0.3	13	0.2
loss of other body part	27	0.2	25	0.2	35	0.4	16	0.2
hearing loss	30	0.2	18	0.2	24	0.3	9	0.1
loss of sight, impaired sight	28	0.2	27	0.3	24	0.3	18	0.2
limited ability to move arms	35	0.3	32	0.3	30	0.3	20	0.3
limited ability to move legs	53	0.4	65	0.6	36	0.4	29	0.4
scarring	261	1.9	145	1.3	107	1.2	65	0.8
chronic pain	140	1.0	110	1.0	61	0.7	69	0.9
Restricted activities (all injuries)								
None	488	3.5	234	2.1	152	1.7	97	1.2
1 day or less	399	2.9	211	1.9	103	1.1	59	0.8
1 day to 1 week	423	3.1	330	3.0	137	1.5	87	1.1

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
8 days to 2 weeks	231	1.7	189	1.7	78	0.9	80	1.0
15 days to 1 month	128	0.9	128	1.2	31	0.3	43	0.6
More than 1 month	163	1.2	166	1.5	64	0.7	69	0.9
Unsure/still restricted	82	0.6	85	0.8	43	0.5	53	0.7
School missed from injury (all injuries)								
None	1418	10.2	758	6.9	442	4.9	250	3.2
1 day or less	92	0.7	209	1.9	23	0.3	85	1.1
1 day to 1 week	72	0.5	152	1.4	31	0.3	66	0.9
8 days to 2 weeks	12	0.1	29	0.3	9	0.1	24	0.3
15 days to 1 month	12	0.1	11	0.1	11	0.1	7	0.1
More than 1 month	14	0.1	31	0.3	11	0.1	12	0.2
Unsure	22	0.2	19	0.2	10	0.1	14	0.2
Work missed from injury (all injuries)								
No	12785	92.2	10137	92.6	8753	96.5	7501	96.1
None	1084	7.8	808	7.4	320	3.5	301	3.9
1 day or less	249	1.8	100	0.9	76	0.8	46	0.6
1 day to 1 week	190	1.4	110	1.0	68	0.8	43	0.6
8 days to 2 weeks	86	0.6	46	0.4	39	0.4	16	0.2
15 days to 1 month	38	0.3	32	0.3	20	0.2	8	0.1
More than 1 month	43	0.3	42	0.4	33	0.4	17	0.2
Unsure	38	0.3	30	0.3	15	0.2	17	0.2
Work missed by parent/guardian (all injuries)								
None	1321	9.5	834	7.6	417	4.6	297	3.8
1 day or less	205	1.5	206	1.9	62	0.7	88	1.1
1 day to 1 week	76	0.6	80	0.7	27	0.3	35	0.5
8 days to 2 weeks	13	0.1	16	0.2	11	0.1	8	0.1
15 days to 1 month	13	0.1	10	0.1	7	0.1	6	0.1
More than 1 month	13	0.1	17	0.2	13	0.1	9	0.1
Unsure	19	0.1	19	0.2	12	0.1	8	0.1
Grades during past 12 months								
Missing or Multiple Categories	569	4.1	555	5.1	339	3.7	384	4.9
Mostly A's	4029	29.1	3256	29.8	2756	30.4	2535	32.5
Mostly B's	5101	36.8	3793	34.7	3478	38.3	2868	36.8
Mostly C's	2609	18.8	2206	20.2	1674	18.5	1359	17.4
Mostly D's	579	4.2	537	4.9	293	3.2	261	3.4
Mostly F's	171	1.2	199	1.8	105	1.2	138	1.8
None of these	38	0.3	43	0.4	46	0.5	40	0.5
Not sure	773	5.6	356	3.3	382	4.2	217	2.8
Driving motorcycle, car or truck during time period								

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Missing	384	2.8	424	3.9	254	2.8	324	4.2
No	3902	28.1	2275	20.8	1278	14.1	839	10.8
Yes	9583	69.1	8246	75.3	7541	83.1	6639	85.1
Boys – Yes	5277	75.0	4340	79.5	3875	84.6	3328	86.7
Girls – Yes	4296	63.8	3891	73.7	3654	82.7	3300	86.0
Grade 9 – Yes	2127	47.2	2016	58.4				
Grade 10 – Yes	3298	72.4	3031	81.5	2371	74.5	2197	80.9
Grade 11 – Yes	3912	86.5	3071	88.5	2656	87.4	2315	90.0
Grade 12 ² - Yes	246	88.5	116	84.7	2492	90.3	2109	89.1
How often wear seatbelt								
Missing	363	2.6	426	3.9	248	2.7	314	4.0
Always	7309	52.7	5653	51.7	4923	54.3	4316	55.3
Sometimes	4257	30.7	3169	29.0	2549	28.1	1914	24.5
Rarely	1253	9.0	1050	9.6	791	8.7	707	9.1
Never	687	5.0	647	5.9	562	6.2	551	7.1
Ever used chewing tobacco								
Missing	397	2.9	431	3.9	271	3.0	334	4.3
No	11664	84.1	8771	80.1	7308	80.6	6048	77.5
Yes	1808	13.0	1743	15.9	1494	16.5	1420	18.2
Currently smoke cigarettes								
Missing	420	3.0	451	4.1	285	3.1	329	4.2
No	11737	84.6	9097	83.1	7579	83.5	6443	82.6
Yes	1712	12.3	1397	12.8	1209	13.3	1030	13.2
Boys - Yes	805	11.4	649	11.9	597	13.0	481	12.5
Girls - Yes	906	13.4	743	14.1	610	13.8	549	14.3
Grade 9 - Yes	360	8.0	351	10.2				
Grade 10 – Yes	552	12.1	473	12.7	329	10.3	290	10.7
Grade 11 – Yes	763	16.9	546	15.7	392	12.9	319	12.4
Grade 12 ² - Yes	37	13.3	23	16.8	485	17.6	419	17.7
If smoked in past 30d, how many cigarettes per day								
Missing	418	3.0	458	4.2	290	3.2	331	4.2
<1	266	1.9	219	2.0	148	1.6	106	1.4
1	120	0.9	91	0.8	67	0.7	75	1.0
2-5	577	4.2	450	4.1	353	3.9	277	3.6
6-10	382	2.8	330	3.0	301	3.3	267	3.4
11-20	274	2.0	206	1.9	219	2.4	173	2.2
> 20	151	1.1	156	1.4	170	1.9	184	2.4
Non-smoker	11680	84.2	9035	82.6	7525	82.9	6388	81.9

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Smoked during survey period								
Missing	416	3.0	455	4.2	298	82.6	332	4.3
No	882	6.4	515	4.7	372	4.1	218	2.8
Yes	1710	12.3	1448	13.2	1210	13.3	1055	13.5
Non-smoker	10861	78.3	8527	77.9	7193	79.3	6197	79.4
Other people smoking at home								
Missing	470	3.4	514	4.7	299	3.3	352	4.5
Often	2986	21.5	2147	19.6	1762	19.4	1416	18.2
Sometimes	1540	11.1	1131	10.3	962	10.6	798	10.2
Rarely	1482	10.7	1201	11.0	1088	12.0	908	11.6
Never	7391	53.3	5952	54.4	4962	54.7	4328	55.5
Friends smoking around you								
Missing	446	3.2	522	4.8	314	3.5	355	4.6
Often	2227	16.1	1852	16.9	1712	18.9	1530	19.6
Sometimes	2510	18.1	1937	17.7	1731	19.1	1477	18.9
Rarely	2396	17.3	1865	17.0	1637	18.0	1457	18.7
Never	6290	45.4	4769	43.6	3679	40.5	2983	38.2
People smoking at work								
Missing	519	3.7	564	5.2	333	3.7	392	5.0
Often	2117	15.3	1564	14.3	1722	19.0	1339	17.2
Sometimes	1933	13.9	1384	12.7	1371	15.1	1052	13.5
Rarely	1432	10.3	997	9.1	873	9.6	656	8.4
Never	4005	28.9	2938	26.8	2638	29.1	2146	27.5
Don't work	3863	27.9	3498	32.0	2136	23.5	2217	28.4
During time period, how many days ≥1 drink of alcohol								
Missing	464	3.4	476	4.4	283	3.1	341	4.4
0	7999	57.7	5886	53.8	4811	53.0	3961	50.8
1-2	1833	13.2	1473	13.5	1094	12.1	923	11.8
3-5	1168	8.4	1017	9.3	763	8.4	729	9.3
6-9	906	6.5	792	7.2	668	7.4	595	7.6
10-19	892	6.4	688	6.3	732	8.1	555	7.1
20-29	369	2.7	347	3.2	395	4.4	340	4.4
All days in month	238	1.7	266	2.4	327	3.6	358	4.6
During time period, how many days ≥5 drinks in a row (<2 hrs)								
Missing	508	3.7	510	4.7	297	3.3	358	4.6
0	10097	72.8	7409	67.7	5957	65.7	4828	61.9
1-2	1287	9.3	1167	10.7	898	9.9	837	10.7
3-5	735	5.3	668	6.1	586	6.5	508	6.5
6-9	495	3.6	497	4.5	489	5.4	475	6.1
10-19	436	3.1	340	3.1	433	4.8	343	4.4
20-29	311	2.2	354	3.2	410	4.5	452	5.8

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
All days in month	0	0.0	0	0.0	3	0.0	1	0.0
Average height (inches)								
N	13428		10476		8788		7475	
Mean	67.47		67.81		68.04		68.11	
S.D.	4.82		5.75		5.96		6.45	
Average weight (lbs)								
N	13338		10404		8733		7411	
Mean	147.54		153.89		156.95		160.45	
S.D.	46.81		58.70		60.85		64.47	
Body Mass Index (BMI)								
Missing	106	0.8	211	1.9	80	0.9	141	1.8
Below 85th percentile ³	10351	74.6	7897	72.2	6652	73.3	5935	76.1
≥85th percentile	3412	24.6	2837	25.9	2341	25.8	1726	22.1
Boys ≥85th percentile	2231	31.7	1899	34.8	1566	34.2	1145	29.8
Girls ≥85th percentile	1181	17.5	938	17.8	775	17.5	581	15.1
Grade 9 ≥85th percentile	1113	24.7	953	27.6				
Grade 10 ≥85th percentile	1171	25.7	994	26.7	884	27.8	654	24.1
Grade 11 ≥85th percentile	1073	23.7	845	24.3	755	24.9	576	22.4
Grade 12 ² ≥85th percentile	55	19.8	39	28.5	694	25.1	491	20.8
Wheezing / whistling in chest within past 12 mo.								
Missing	1601	11.5	1115	10.2	938	10.3	848	10.9
No	10124	73.0	8166	74.6	6998	77.1	6046	77.5
Yes	2144	15.5	1664	15.2	1137	12.5	908	11.6
Wheezing /whistling during exercise in past 12 mo.								
Missing	1645	11.9	1150	10.5	966	10.7	864	11.1
No	9650	69.6	7808	71.3	6805	75.0	5880	75.4
Yes	2574	18.6	1987	18.2	1302	14.4	1058	13.6
Doctor ever told have asthma								
Missing	1728	12.5	1241	11.3	1073	11.8	949	12.2
No	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Yes	1539	11.1	1205	11.0	884	9.7	709	9.1
Still have asthma								
Missing	1716	12.4	1231	11.3	1056	11.6	939	12.0
No	440	3.2	329	3.0	280	3.1	203	2.6
Yes	1111	8.0	886	8.1	621	6.8	516	6.6
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Is asthma work-related								
Missing	1900	13.7	1367	12.5	1134	12.5	1000	12.8
No	1136	8.2	848	7.8	674	7.4	514	6.6

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
Yes	231	1.7	231	2.1	149	1.6	144	1.9
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Have regular Dr. or clinic for asthma care								
Missing	1752	12.6	1251	11.4	1071	11.8	951	12.2
No	874	6.3	655	6.0	478	5.3	380	4.9
Yes	641	4.6	540	4.9	408	4.5	327	4.2
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Does your asthma bother you								
Missing	1828	13.2	1316	12.0	1111	12.2	980	12.6
< 1 time/week	1046	7.5	850	7.8	619	6.8	526	6.7
2-3 times/week	257	1.9	182	1.7	142	1.6	77	1.0
Almost every day	136	1.0	98	0.9	85	0.9	75	1.0
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
<i>Have an Asthma Action Plan</i>								
Missing	1773	12.8	1274	11.6	1082	11.9	961	12.3
No	998	7.2	771	7.0	560	6.2	429	5.5
Yes	496	3.6	401	3.7	315	3.5	268	3.4
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Use asthma medications every day regardless of symptoms								
Missing	1775	12.8	1278	11.7	1086	12.0	964	12.4
No	1024	7.4	819	7.5	604	6.7	468	6.0
Yes	468	3.4	349	3.2	267	2.9	226	2.9
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Use medications only when symptoms								
Missing	1771	12.8	1279	11.7	1092	12.0	965	12.4
No	445	3.2	338	3.1	264	2.9	201	2.6
Yes	1051	7.6	829	7.6	601	6.6	492	6.3
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
Use medications before exercise								
Missing	1774	12.8	1281	11.7	1092	12.0	967	12.4
No	794	5.7	599	5.5	439	4.8	333	4.3
Yes	699	5.0	566	5.2	426	4.7	358	4.6
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.8
School missed in last 30 days from asthma								
Missing	1772	12.8	1272	11.6	1085	12.0	934	12.4
None	1339	9.7	1001	9.2	764	8.4	586	7.5
< 1 day	77	0.6	72	0.7	34	0.4	27	0.4
2-4 days	57	0.4	32	0.3	22	0.2	30	0.4
5-9 days	23	0.2	20	0.2	23	0.3	17	0.2

Time Period Covered by Survey	June – August 2001		Sept. – May 2001-02		June – August 2002		Sept. – May 2002-03	
	N	%	N	%	N	%	N	%
≥ 10 days	18	0.1	52	0.5	23	0.3	36	0.5
Don't know/Unsure	46	0.3	39	0.4	36	0.4	26	0.3
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.7
Work missed in last 30 days from asthma								
Missing	1775	12.8	1271	11.6	1084	12.0	960	12.3
None	1428	10.3	1074	9.8	788	8.7	635	8.1
≤ 1 day	37	0.3	22	0.2	24	0.3	15	0.2
2-4 days	27	0.2	31	0.3	23	0.3	15	0.2
5-9 days	7	0.1	15	0.1	11	0.1	9	0.1
≥ 10 days	21	0.2	41	0.4	27	0.3	29	0.4
Don't know/Unsure	35	0.3	33	0.3	31	0.3	19	0.2
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.7
Organized sports missed in last 30 days from asthma								
Missing	1768	12.7	1274	11.6	1088	12.0	966	12.4
None	1279	9.2	937	8.6	733	8.1	593	7.6
≤ 1 day	125	0.9	114	1.0	62	0.7	41	0.5
2-4 days	79	0.6	45	0.4	29	0.3	19	0.2
5-9 days	8	0.1	20	0.2	14	0.2	10	0.1
≥ 10 days	25	0.2	48	0.4	24	0.3	32	0.4
Don't know/Unsure	44	0.3	48	0.4	38	0.4	22	0.3
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.7
Recreational activities missed in last 30 days from asthma								
Missing	1768	12.7	1273	11.6	1093	12.0	963	12.3
None	1302	9.4	965	8.8	749	8.3	605	7.8
≤ 1 day	102	0.7	80	0.7	48	0.5	34	0.4
2-4 days	66	0.5	47	0.4	27	0.3	17	0.2
5-9 days	18	0.1	20	0.2	6	0.1	11	0.1
≥ 10 days	18	0.1	45	0.4	29	0.3	27	0.4
Don't know/Unsure	52	0.4	54	0.5	34	0.4	26	0.3
No Asthma	10602	76.4	8499	77.7	7116	78.4	6144	78.7

¹ Surveys were administered on different dates for different schools and grades, spanning several months. See text for a description of survey administration.

² Since one of the aims of this study was to follow a cohort over two years, 12th grade students were not surveyed during the first year, while 9th grade students were not surveyed during the second year. However, a single school included 12th graders during the first two surveys; these numbers are shown for completeness, but the findings are not reliable due to the very small numbers and are not representative.

³ Body Mass Index (BMI) percentiles were based on age and gender using CDC 2000 growth charts (<http://www.cdc.gov/growthcharts>).

Table 9. Detailed Work Experiences of Students by Survey Period

Time Period Covered by Survey	June-August 2001		Sept.–May 2001-02		June-August 2002		Sept.– May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Ever Worked During Survey Period (all students)								
No	2669	19.2	3824	34.9	2490	27.4	3326	42.6
Yes	10986	79.2	6757	61.7	6371	70.2	4209	54.0
Missing	214	1.5	364	3.3	212	2.3	267	3.4
Worked by Gender (all students)								
Boys	5450	77.5	3087	56.5	3021	66.0	1787	46.6
Girls	5512	81.8	3637	68.9	3341	75.6	2417	63.0
Missing	24	24.0	33	15.9	9	11.8	5	3.9
Worked by Grade Level (all students)								
Grade 9 (freshmen)	3325	73.8	1872	54.3				
Grade 10 (sophomores)	3422	75.1	2223	59.8	1976	62.1	1270	46.8
Grade 11 (juniors)	3985	88.1	2547	73.4	2159	71.1	1495	58.1
Grade 12 (seniors)	252	90.6	106	77.4	2215	80.3	1435	60.7
Missing	2	22.2	9	5.4	21	22.8	9	6.1
Worked by Grade Level and Gender (all students)								
Grade 9 (freshmen)								
Boys	1645	72.0	855	48.0				
Girls	1676	76.6	1012	61.1				
Missing	4	13.8	5	35.7				
Grade 10 (sophomores)								
Boys	1698	73.7	1003	53.9	956	58.5	532	38.8
Girls	1716	77.4	1209	66.0	1019	66.0	738	55.1
Missing	8	23.5	11	40.7	1	20.0	0	0.0
Grade 11 (juniors)								
Boys	1989	86.3	1180	67.8	983	65.0	630	49.8
Girls	1984	90.6	1355	79.4	1176	77.2	865	66.4
Missing	12	41.4	12	50.0	0	0.0	0	0.0
Grade 12 (seniors)								
Boys	116	86.6	46	73.0	1074	75.8	621	52.7
Girls	136	95.8	57	80.3	1141	85.1	811	68.6
Missing	0	0.0	3	100.0	0	0.0	3	50.0
Worked by Age (years, at time of survey; all students)								

Time Period Covered by Survey	June-August 2001		Sept.–May 2001-02		June-August 2002		Sept.– May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
≤14	2168	75.0	575	53.7	8	50.0		
15	3361	74.4	1887	56.5	1421	62.6	24	28.6
16	3782	83.7	2320	63.2	2114	68.7	372	46.5
17	1547	86.8	1801	72.4	2152	76.6	1289	50.9
≥18	128	82.6	171	70.1	670	79.6	2524	59.1
Missing	0	0.0	3	2.2	6	10.3	0	0.0
Worked by Race (all students)								
African American/Black	71	53.8	50	37.9	38	34.2	27	31.0
Native American/Alaskan Native	157	73.0	69	49.3	48	61.5	21	38.2
Other/Mixed	161	71.6	92	63.4	53	46.9	39	39.4
Asian	113	69.3	62	46.6	9	36.0	101	41.2
Native Hawaiian/Pacific Islander	18	60.0	14	48.3	152	49.8	12	42.9
White/Caucasian	10342	80.5	6367	63.7	6033	72.7	3990	56.1
Missing	124	47.3	103	28.3	38	27.7	19	11.0
Worked by Latino ethnicity (all students)								
Non-Hispanic	10473	80.5	6419	63.3	6145	71.8	4040	55.6
Hispanic	277	61.6	178	48.0	126	43.6	100	39.4
Missing	236	57.4	160	36.6	100	43.7	69	25.0
Worked by Race/Ethnicity (all students)								
White-Non Hispanic	9943	81.1	6137	64.1	5904	72.9	3894	56.3
Black-Non Hispanic	60	58.8	33	36.7	32	39.5	19	33.9
Hispanic	277	61.6	178	48.0	126	43.6	100	39.4
Native American-Non Hispanic	144	74.6	60	53.6	38	59.4	17	38.6
Other Non Hispanic	326	71.6	189	53.4	171	54.8	110	43.7
Other-unknown ethnicity	202	68.5	111	54.7	85	59.9	65	45.5
Missing	34	29.3	49	20.9	15	17.2	4	3.0
Worked by Race/Ethnicity and Gender (all students)								
Boys								
White-Non Hispanic	4957	79.6	2625	57.5	2646	68.2	1556	47.3
Black-Non Hispanic	35	54.7	16	44.4	12	44.4	8	42.1
Hispanic	121	52.8	70	47.6	46	39.3	37	36.3
Native American-Non Hispanic	73	71.6	28	56.0	17	60.7	6	28.6
Other Non Hispanic	162	67.5	66	45.5	57	48.7	35	35.7
Other-unknown ethnicity	93	62.8	56	54.9	52	73.2	31	52.5
Missing	9	47.4	226	54.3	191	56.2	114	46.2

Time Period Covered by Survey	June-August 2001		Sept.–May 2001-02		June-August 2002		Sept.– May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Girls								
White-Non Hispanic	4983	82.7	3086	69.9	2884	76.8	2114	64.2
Black-Non Hispanic	25	69.4	8	36.4	9	36.0	5	29.4
Hispanic	153	70.2	83	60.6	66	64.1	44	53.0
Native American-Non Hispanic	71	78.0	29	63.0	20	71.4	9	56.3
Other Non Hispanic	164	76.6	83	61.0	65	64.4	50	53.2
Other-unknown ethnicity	107	75.9	59	60.8	59	73.8	43	67.2
Missing	9	69.2	289	67.5	238	73.0	152	56.5
Worked by Farm Residence (all students)								
Did not live on farm	9224	78.4	5442	60.4	5246	68.8	3487	53.3
Lived on farm	1639	88.5	1216	76.8	1067	82.7	686	64.7
Missing	123	48.4	99	28.8	58	36.5	36	18.4
Worked by Farm Residence and Gender (all students)								
Boys								
Did not live on farm	4472	76.0	2380	53.1	2406	63.3	1416	44.1
Lived on farm	906	87.5	666	75.9	583	81.1	348	60.9
Missing	72	64.3	41	43.2	32	56.1	23	43.4
Girls								
Did not live on farm	4745	80.9	3056	67.7	2837	74.4	2070	62.3
Lived on farm	731	89.9	549	78.2	484	84.9	336	69.1
Missing	36	61.0	32	49.2	20	54.1	11	39.3
Worked by Grade Level and Farm Residence (all students)								
Grade 9 (freshmen)								
Did not live on farm	2758	72.4	1478	51.4				
Lived on farm	523	87.8	367	73.7				
Missing	44	45.8	27	36.5				
Grade 10 (sophomores)								
Did not live on farm	2866	74.4	1803	57.9	1619	59.8	1043	44.8
Lived on farm	519	84.4	394	73.0	338	77.9	212	59.9
Missing	37	43.0	26	41.3	19	44.2	15	41.7
Grade 11 (juniors)								
Did not live on farm	3368	87.7	2069	71.7	1798	69.6	1255	56.8
Lived on farm	576	93.1	441	83.7	350	81.4	231	67.2
Missing	41	65.1	37	61.7	11	47.8	9	47.4
Grade 12 (seniors)								
Did not live on farm	230	90.6	89	76.7	1822	78.6	1184	59.5

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Lived on farm	21	100.0	13	81.3	379	89.6	241	67.9
Missing	1	33.3	4	80.0	14	73.7	10	47.6
Number of jobs worked								
Missing	214	1.5	364	3.3	212	2.3	267	3.4
0	2863	20.6	4016	36.7	2671	29.4	3486	44.7
1	3205	23.1	2353	21.5	2405	26.5	1887	24.2
2	3469	25.0	2080	19.0	2024	22.3	1228	15.7
3	2103	15.2	1110	10.1	1001	11.0	539	6.9
4	2015	14.5	1022	9.3	760	8.4	395	5.1
Mean # of jobs (all students)	1.8		1.3		1.4		1.0	
Mean # of jobs (for those working)	2.2		2.1		2.0		1.8	
Job Descriptions- (any jobs, for those who worked)								
<i>Personal Services</i>	7757	70.6	4025	59.6	3355	52.7	1820	43.2
Lawn Care	4448	40.5	1722	25.5	1726	27.1	606	14.4
Babysitting	4175	38.0	2364	35.0	1602	25.1	961	22.8
Maid/Housekeeper	1397	12.7	755	11.2	530	8.3	326	7.7
Clean/Janitorial	1040	9.5	590	8.7	393	6.2	263	6.2
Day Care/Child Care	319	2.9	158	2.3	154	2.4	115	2.7
Delivery person	223	2.0	140	2.1	101	1.6	68	1.6
Car wash worker	245	2.2	132	2.0	91	1.4	47	1.1
<i>Restaurant/Fast food</i>	2725	24.8	1913	28.3	1750	27.5	1328	31.6
Car hop/Fast food server	465	4.2	339	5.0	263	4.1	207	4.9
Cook-Fast food	897	8.2	691	10.2	678	10.6	513	12.2
Wait person	597	5.4	451	6.7	449	7.0	396	9.4
Buser	334	3.0	208	3.1	199	3.1	137	3.3
Dishwasher	1006	9.2	645	9.5	522	8.2	362	8.6
Host/hostess	210	1.9	159	2.4	174	2.7	116	2.8
<i>Retail</i>	2085	19.0	1638	24.2	1526	24.0	1239	29.4
Cashier	1322	12.0	1086	16.1	1023	16.1	844	20.1
Stock Clerk	364	3.3	247	3.7	259	4.1	205	4.9
Sales clerk	330	3.0	273	4.0	255	4.0	231	5.5
Station attendant	92	0.8	90	1.3	81	1.3	56	1.3
Grocery bagger	400	3.6	327	4.8	202	3.2	158	3.8
<i>Professional/Medical</i>	666	6.1	578	8.6	500	7.8	430	10.2
Vet's helper	66	0.6	39	0.6	34	0.5	30	0.7
Teacher/Aide	48	0.4	98	1.5	24	0.4	52	1.2

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Orderly/Nusing home/PCA	207	1.9	221	3.3	215	3.4	199	4.7
Receptionist/Office	230	2.1	159	2.4	158	2.5	124	2.9
Computer Op/Programmer	107	1.0	82	1.2	59	0.9	32	0.8
Small animal related	31	0.3	8	0.1	13	0.2	2	0.0
Lab or Pharm tech	3	0.0	3	0.0	15	0.2	4	0.1
<i>Construction/Manufacturing/Food processing/Cars</i>	<i>1577</i>	<i>14.4</i>	<i>661</i>	<i>9.8</i>	<i>955</i>	<i>15.0</i>	<i>372</i>	<i>8.8</i>
Laborer	1481	13.5	602	8.9	876	13.7	336	8.0
Line worker	137	1.2	71	1.1	99	1.6	41	1.0
<i>Entertainment/Recreation</i>	<i>1150</i>	<i>10.5</i>	<i>455</i>	<i>6.7</i>	<i>656</i>	<i>10.3</i>	<i>262</i>	<i>6.2</i>
Amusement park Attend.	108	1.0	55	0.8	74	1.2	36	0.9
Lifeguard	260	2.4	124	1.8	226	3.5	102	2.4
Receation/Camp couns./sports instr.	437	4.0	147	2.2	223	3.5	80	1.9
Dockhand	99	0.9	40	0.6	48	0.8	18	0.4
Special events	339	3.1	117	1.7	116	1.8	37	0.9
<i>Agricultural activities</i>	<i>2102</i>	<i>19.1</i>	<i>1243</i>	<i>18.4</i>	<i>1152</i>	<i>18.1</i>	<i>609</i>	<i>14.5</i>
Farm--farmer	1873	17.0	1120	16.6	1044	16.4	556	13.2
Farm--agri-business	438	4.0	269	4.0	224	3.5	107	2.5
<i>Other</i>	<i>281</i>	<i>2.6</i>	<i>164</i>	<i>2.4</i>	<i>136</i>	<i>2.1</i>	<i>79</i>	<i>1.9</i>
Job Descriptions – Broad categories by Gender (distribution within category)								
<i>Personal Services</i>								
Boys	3388	43.7	1532	38.1	1368	40.8	611	33.6
Girls	4364	56.3	2491	61.9	1984	59.1	1209	66.4
Missing	5	0.1	2	0.0	3	0.1	0	0.0
<i>Restaurant/Fast food</i>								
Boys	1145	42.0	737	38.5	641	36.6	435	32.8
Girls	1580	58.0	1170	61.2	1109	63.4	892	67.2
Missing	0	0.0	6	0.3	0	0.0	1	0.1
<i>Retail</i>								
Boys	966	46.3	717	43.8	596	39.1	481	38.8
Girls	1118	53.6	916	55.9	930	60.9	757	61.1
Missing	1	0.0	5	0.3	0	0.0	1	0.1

Time Period Covered by Survey	June-August 2001		Sept.–May 2001-02		June-August 2002		Sept.– May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
<i>Professional/Medical</i>								
Boys	189	28.4	142	24.6	120	24.0	80	18.6
Girls	476	71.5	434	75.1	379	75.8	350	81.4
Missing	1	0.2	2	0.3	1	0.2	0	0.0
<i>Construction/Manufacturing/Food processing/Cars</i>								
Boys	1377	87.3	571	86.4	840	88.0	325	87.4
Girls	197	12.5	87	13.2	115	12.0	47	12.6
Missing	3	0.2	3	0.5	0	0.0	0	0.0
<i>Entertainment/Recreation</i>								
Boys	503	43.7	200	44.0	263	40.1	96	36.6
Girls	644	56.0	253	55.6	392	59.8	165	63.0
Missing	3	0.3	2	0.4	1	0.2	1	0.4
<i>Agricultural activities</i>								
Boys	1430	68.0	816	65.6	799	69.4	404	66.3
Girls	671	31.9	426	34.3	352	30.6	205	33.7
Missing	1	0.0	1	0.1	1	0.1	0	0.0
<i>Other</i>								
Boys	172	61.2	80	48.8	74	54.4	52	65.8
Girls	109	38.8	84	51.2	62	45.6	27	34.2
Job Descriptions – Broad categories by Gender (any job, prevalence among those working)								
<i>Personal Services</i>								
Boys	3388	62.2	1532	49.6	1368	45.3	611	34.2
Girls	4364	79.2	2491	68.5	1984	59.4	1209	50.0
Missing	5	20.8	2	6.1	3	33.3	0	0.0
<i>Restaurant/Fast food</i>								
Boys	1145	21.0	737	23.9	641	21.2	435	24.3
Girls	1580	28.7	1170	32.2	1109	33.2	892	36.9
Missing	0	0.0	6	18.2	0	0.0	1	20.0
<i>Retail</i>								
Boys	966	17.7	717	23.2	596	19.7	481	26.9
Girls	1118	20.3	916	25.2	930	27.8	757	31.3
Missing	1	4.2	5	15.2	0	0.0	1	20.0

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
<i>Professional/Medical</i>								
Boys	189	3.5	142	4.6	120	4.0	80	4.5
Girls	476	8.6	434	11.9	379	11.3	350	14.5
Missing	1	4.2	2	6.1	1	11.1	0	0.0
<i>Construction/Manufacturing/Food processing/Cars</i>								
Boys	1377	25.3	571	18.5	840	27.8	325	18.2
Girls	197	3.6	87	2.4	115	3.4	47	1.9
Missing	3	12.5	3	9.1	0	0.0	0	0.0
<i>Entertainment/Recreation</i>								
Boys	503	9.2	200	6.5	263	8.7	96	5.4
Girls	644	11.7	253	7.0	392	11.7	165	6.8
Missing	3	12.5	2	6.1	1	11.1	1	20.0
<i>Agricultural activities</i>								
Boys	1430	26.2	816	26.4	799	26.4	404	22.6
Girls	671	12.2	426	11.7	352	10.5	205	8.5
Missing	1	4.2	1	3.0	1	11.1	0	0.0
<i>Other</i>								
Boys	172	3.2	80	2.6	74	2.4	52	2.9
Girls	109	2.0	84	2.3	62	1.9	27	1.1
Weekday mean hours worked (of those who worked)								
Job 1	5.0	0.0	3.6	0.0	5.7	0.0	4.0	0.0
Job 2	4.6	0.0	3.4	0.0	5.0	0.1	3.7	0.1
Job 3	4.4	0.1	3.3	0.1	4.8	0.1	3.7	0.1
Job 4	4.5	0.1	3.5	0.1	4.9	0.1	4.0	0.2
Weekday mean hours worked by gender(of those who worked)								
Boys								
Job 1	5.1	0.0	3.5	0.0	6.0	0.1	4.2	0.1
Job 2	4.6	0.1	3.5	0.1	5.1	0.1	3.8	0.1
Job 3	4.7	0.1	3.4	0.1	5.0	0.1	3.9	0.2
Job 4	4.8	0.1	3.7	0.2	5.1	0.2	4.5	0.3
Girls								
Job 1	5.0	0.0	3.6	0.0	5.4	0.0	3.9	0.1
Job 2	4.6	0.0	3.4	0.1	4.9	0.1	3.7	0.1

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Job 3	4.1	0.1	3.3	0.1	4.6	0.1	3.5	0.1
Job 4	4.2	0.1	3.4	0.1	4.8	0.1	3.8	0.2
Weekday mean hours worked by grade (of those who worked)								
Grade 9								
Job 1	4.4	0.1	3.0	0.1				
Job 2	4.2	0.1	3.0	0.1				
Job 3	4.1	0.1	3.1	0.1				
Job 4	4.2	0.1	3.2	0.2				
Grade 10								
Job 1	4.9	0.1	3.6	0.1	4.9	0.1	3.6	0.1
Job 2	4.5	0.1	3.5	0.1	4.7	0.1	3.5	0.1
Job 3	4.4	0.1	3.3	0.1	4.6	0.1	3.6	0.2
Job 4	4.6	0.1	3.6	0.2	4.6	0.2	4.1	0.3
Grade 11								
Job 1	5.7	0.1	3.9	0.0	5.9	0.1	4.1	0.1
Job 2	4.9	0.1	3.7	0.1	5.0	0.1	3.8	0.1
Job 3	4.6	0.1	3.5	0.1	4.8	0.1	3.6	0.1
Job 4	4.5	0.1	3.6	0.1	5.2	0.2	3.8	0.2
Grade 12								
Job 1	6.2	0.2	4.3	0.2	6.2	0.1	4.3	0.1
Job 2	5.5	0.3	4.3	0.4	5.2	0.1	4.0	0.1
Job 3	4.6	0.4	4.4	0.6	4.9	0.1	3.9	0.2
Job 4	5.7	0.6	5.1	0.8	5.0	0.2	4.2	0.3
Weekend mean hours worked (of those who worked)								
Job 1	4.8	0.0	5.2	0.0	5.4	0.0	5.9	0.1
Job 2	4.4	0.0	4.6	0.1	4.9	0.1	5.3	0.1
Job 3	4.1	0.1	4.4	0.1	4.6	0.1	5.0	0.1
Job 4	4.2	0.1	4.5	0.1	4.8	0.1	5.2	0.2
Weekend mean hours worked by gender (of those who worked)								
Boys								
Job 1	4.7	0.1	5.2	0.1	5.3	0.1	6.1	0.1
Job 2	4.4	0.1	4.7	0.1	4.8	0.1	5.5	0.1
Job 3	4.4	0.1	4.5	0.1	4.8	0.2	5.4	0.2
Job 4	4.5	0.1	4.7	0.2	4.9	0.2	5.6	0.3
Girls								
Job 1	4.9	0.0	5.2	0.1	5.5	0.1	5.7	0.1

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Job 2	4.5	0.1	4.5	0.1	5.0	0.1	5.2	0.1
Job 3	3.9	0.1	4.3	0.1	4.5	0.1	4.8	0.1
Job 4	4.0	0.1	4.3	0.1	4.6	0.2	5.0	0.2
Weekend mean hours worked by grade (of those who worked)								
Grade 9								
Job 1	4.1	0.1	4.3	0.1				
Job 2	4.0	0.1	4.0	0.1				
Job 3	3.6	0.1	4.0	0.1				
Job 4	3.9	0.1	4.1	0.2				
Grade 10								
Job 1	4.5	0.1	5.2	0.1	4.6	0.1	5.3	0.1
Job 2	4.3	0.1	4.6	0.1	4.4	0.1	4.9	0.1
Job 3	4.1	0.1	4.4	0.1	4.3	0.1	5.0	0.2
Job 4	4.3	0.2	4.6	0.2	4.3	0.2	5.4	0.3
Grade 11								
Job 1	5.5	0.1	5.9	0.1	5.6	0.1	6.0	0.1
Job 2	4.9	0.1	5.1	0.1	5.1	0.1	5.4	0.1
Job 3	4.5	0.1	4.7	0.1	4.8	0.1	4.8	0.2
Job 4	4.4	0.1	4.6	0.2	5.2	0.2	4.9	0.3
Grade 12								
Job 1	6.1	0.2	5.9	0.4	5.9	0.1	6.3	0.1
Job 2	5.6	0.3	5.1	0.5	5.3	0.1	5.6	0.1
Job 3	4.2	0.4	5.0	0.8	4.8	0.1	5.2	0.2
Job 4	5.3	0.6	5.1	1.1	4.9	0.2	5.3	0.3
Mean Duration of work (weeks) of those working								
Job 1	11.1	0.0	23.7	0.2	11.2	0.0	25.0	0.2
Job 2	10.7	0.0	23.7	0.2	11.0	0.1	24.5	0.3
Job 3	10.7	0.1	23.7	0.3	11.4	0.1	25.6	0.4
Job 4	10.6	0.1	23.9	0.4	11.3	0.1	25.5	0.7
Mean Duration of work (weeks) by gender of those working								
Boys								
Job 1	11.2	0.0	3.5	0.0	11.3	0.1	24.2	0.3
Job 2	10.8	0.1	3.5	0.1	11.2	0.1	23.6	0.5
Job 3	10.8	0.1	3.4	0.1	11.4	0.1	25.6	0.8
Job 4	10.6	0.1	3.7	0.2	11.3	0.2	26.4	1.2
Girls								

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Job 1	11.0	0.0	3.6	0.0	11.2	0.1	25.5	0.3
Job 2	10.7	0.1	3.4	0.1	10.9	0.1	24.9	0.3
Job 3	10.7	0.1	3.3	0.1	11.4	0.1	25.5	0.5
Job 4	10.5	0.1	3.4	0.1	11.4	0.2	25.0	0.8
Mean Duration of work (weeks) by grade,of those working								
Grade 9								
Job 1	11.1	0.1	22.5	0.3				
Job 2	11.1	0.1	24.2	0.3	11.3	0.1	24.0	0.4
Job 3	11.2	0.1	24.2	0.3	11.2	0.1	25.3	0.3
Job 4	10.8	0.2	22.7	1.1	11.3	0.1	25.4	0.3
Grade 10								
Job 1	10.7	0.1	23.8	0.4				
Job 2	10.7	0.1	23.7	0.4	10.9	0.1	24.2	0.5
Job 3	10.7	0.1	23.8	0.3	11.1	0.1	24.9	0.5
Job 4	10.6	0.3	21.8	1.7	11.1	0.1	24.2	0.5
Grade 11								
Job 1	10.6	0.1	23.9	0.6				
Job 2	10.8	0.1	23.9	0.5	11.4	0.2	25.5	0.8
Job 3	10.7	0.1	23.5	0.5	11.3	0.2	26.0	0.7
Job 4	10.9	0.4	22.2	2.2	11.3	0.1	25.1	0.7
Grade 12								
Job 1	10.5	0.2	24.1	0.9				
Job 2	10.7	0.2	24.7	0.7	11.2	0.2	27.0	1.1
Job 3	10.5	0.2	23.4	0.7	11.4	0.2	25.7	1.2
Job 4	10.6	0.6	17.5	3.2	11.4	0.2	23.8	1.2
Performed job tasks involving (all jobs, proportion of those working)								
drive tractor/combine								
Boys	1409	25.9	864	28.0	855	28.3	448	25.1
Girls	419	7.6	282	7.8	253	7.6	137	5.7
truck driver products								
Boys	595	10.9	497	16.1	533	17.6	316	17.7
Girls	118	2.1	118	3.2	105	3.1	77	3.2
repair/maintain machinery								
Boys	1519	27.9	953	30.9	971	32.1	541	30.3
Girls	273	5.0	202	5.6	165	4.9	107	4.4
bail/stack hay								
Boys	1136	20.8	689	22.3	662	21.9	332	18.6
Girls	455	8.3	323	8.9	247	7.4	144	6.0

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
hand harvest fruits/veg								
Boys	391	7.2	238	7.7	233	7.7	112	6.3
Girls	302	5.5	165	4.5	149	4.5	83	3.4
hoe, pick rocks, cut weeds								
Boys	1582	29.0	862	27.9	836	27.7	378	21.2
Girls	847	15.4	476	13.1	390	11.7	205	8.5
livestock chores								
Boys	928	17.0	643	20.8	549	18.2	304	17.0
Girls	505	9.2	338	9.3	260	7.8	165	6.8
milk cows								
Boys	354	6.5	282	9.1	207	6.9	137	7.7
Girls	145	2.6	108	3.0	85	2.5	57	2.4
build fences								
Boys	888	16.3	586	19.0	546	18.1	281	15.7
Girls	309	5.6	228	6.3	170	5.1	115	4.8
clean livestock barns/pens								
Boys	827	15.2	590	19.1	514	17.0	283	15.8
Girls	419	7.6	301	8.3	233	7.0	153	6.3
move animals								
Boys	795	14.6	587	19.0	522	17.3	280	15.7
Girls	404	7.3	311	8.6	227	6.8	165	6.8
breeding animals								
Boys	299	5.5	262	8.5	216	7.1	144	8.1
Girls	139	2.5	104	2.9	73	2.2	62	2.6
pesticide appl/tend spray trucks								
Boys	316	5.8	279	9.0	254	8.4	148	8.3
Girls	53	1.0	45	1.2	50	1.5	29	1.2
detasseling								
Boys	141	2.6	103	3.3	81	2.7	44	2.5
Girls	54	1.0	32	0.9	26	0.8	13	0.5
custom/crew hand harvesting								
Boys	146	2.7	117	3.8	97	3.2	54	3.0
Girls	53	1.0	38	1.0	25	0.7	21	0.9
custom/crew machine harvesting								
Boys	320	5.9	242	7.8	204	6.8	107	6.0
Girls	63	1.1	58	1.6	45	1.3	29	1.2
poultry catching								
Boys	202	3.7	154	5.0	120	4.0	62	3.5
Girls	101	1.8	74	2.0	64	1.9	37	1.5
building cleaning								
Boys	1074	19.7	641	20.8	634	21.0	374	20.9
Girls	520	9.4	313	8.6	288	8.6	176	7.3

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
manure pumping								
Boys	287	5.3	269	8.7	198	6.6	150	8.4
Girls	84	1.5	56	1.5	45	1.3	36	1.5
landscaping								
Boys	1349	24.8	684	22.2	789	26.1	330	18.5
Girls	450	8.2	262	7.2	235	7.0	119	4.9
Work included this activity (all jobs, proportion of those working)								
operate power machine (except motor vehicle)								
Boys	2450	45.0	1288	41.7	1401	46.4	707	39.6
Girls	831	15.1	475	13.1	439	13.1	224	9.3
operate power hand tools								
Boys	2603	47.8	1373	44.5	1561	51.7	801	44.8
Girls	716	13.0	463	12.7	423	12.7	276	11.4
operate non-power hand tools								
Boys	2709	49.7	1543	50.0	1654	54.8	931	52.1
Girls	1606	29.1	1082	29.7	971	29.1	680	28.1
lifting/bending/twisting								
Boys	3048	55.9	1764	57.1	1902	63.0	1067	59.7
Girls	2251	40.8	1629	44.8	1533	45.9	1121	46.4
using chemicals								
Boys	1428	26.2	958	31.0	1027	34.0	630	35.3
Girls	868	15.7	667	18.3	682	20.4	514	21.3
drive car or truck								
Boys	1864	34.2	1162	37.6	1323	43.8	703	39.3
Girls	788	14.3	603	16.6	619	18.5	421	17.4
work with animals								
Boys	1108	20.3	748	24.2	650	21.5	377	21.1
Girls	745	13.5	512	14.1	371	11.1	237	9.8
climbing/working from heights								
Boys	1642	30.1	940	30.5	1131	37.4	585	32.7
Girls	577	10.5	438	12.0	399	11.9	283	11.7
work around hot surface								
Boys	1846	33.9	1197	38.8	1207	40.0	759	42.5
Girls	1975	35.8	1369	37.6	1259	37.7	972	40.2
Job tasks by gender (all jobs, distribution within task)								
drive tractor/combine								
Boys	1409	77.0	864	75.1	855	77.2	448	76.5
Girls	419	22.9	282	24.5	253	22.8	137	23.4

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
truck driver products								
Boys	595	83.5	497	80.3	533	83.5	316	80.4
Girls	118	16.5	118	19.1	105	16.5	77	19.6
repair/maintain machinery								
Boys	1519	84.7	953	82.2	971	85.5	541	83.5
Girls	273	15.2	202	17.4	165	14.5	107	16.5
bail/stack hay								
Boys	1136	71.3	689	67.9	662	72.8	332	69.5
Girls	455	28.6	323	31.9	247	27.2	144	30.1
hand harvest fruits/veg								
Boys	391	56.4	238	58.8	233	61.0	112	57.4
Girls	302	43.6	165	40.7	149	39.0	83	42.6
hoe, pick rocks, cut weeds								
Boys	1582	65.1	862	64.3	836	68.2	378	64.8
Girls	847	34.9	476	35.5	390	31.8	205	35.2
livestock chores								
Boys	928	64.8	643	65.4	549	67.8	304	64.7
Girls	505	35.2	338	34.4	260	32.1	165	35.1
milk cows								
Boys	354	70.9	282	72.1	207	70.9	137	69.9
Girls	145	29.1	108	27.6	85	29.1	57	29.1
build fences								
Boys	888	74.2	586	71.7	546	76.3	281	71.0
Girls	309	25.8	228	27.9	170	23.7	115	29.0
clean livestock barns/pens								
Boys	827	66.3	590	66.1	514	68.8	283	64.9
Girls	419	33.6	301	33.7	233	31.2	153	35.1
move animals								
Boys	795	66.3	587	65.2	522	69.7	280	62.9
Girls	404	33.7	311	34.6	227	30.3	165	37.1
breeding animals								
Boys	299	68.1	262	71.0	216	74.7	144	69.9
Girls	139	31.7	104	28.2	73	25.3	62	30.1
pesticide appl/tend spray trucks								
Boys	316	85.6	279	85.8	254	83.6	148	83.1
Girls	53	14.4	45	13.8	50	16.4	29	16.3
detasseling								
Boys	141	72.3	103	74.6	81	75.7	44	77.2
Girls	54	27.7	32	23.2	26	24.3	13	22.8
custom/crew hand harvesting								
Boys	146	73.4	117	75.0	97	79.5	54	72.0
Girls	53	26.6	38	24.4	25	20.5	21	28.0

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
custom/crew machine harvesting								
Boys	320	83.6	242	80.1	204	81.9	107	78.7
Girls	63	16.4	58	19.2	45	18.1	29	21.3
poultry catching								
Boys	202	66.4	154	67.2	120	65.2	62	62.6
Girls	101	33.2	74	32.3	64	34.8	37	37.4
building cleaning								
Boys	1074	67.3	641	67.1	634	68.8	374	68.0
Girls	520	32.6	313	32.7	288	31.2	176	32.0
manure pumping								
Boys	287	77.2	269	82.5	198	81.5	150	80.6
Girls	84	22.6	56	17.2	45	18.5	36	19.4
landscaping								
Boys	1349	74.9	684	72.2	789	77.0	330	73.5
Girls	450	25.0	262	27.6	235	22.9	119	26.5
Work activity by gender (all jobs, distribution within activity)								
operate power machine (except motor vehicle)								
Boys	2450	74.6	1288	72.9	1401	76.1	707	75.9
Girls	831	25.3	475	26.9	439	23.8	224	24.0
operate power hand tools								
Boys	2603	78.4	1373	74.6	1561	78.6	801	74.3
Girls	716	21.6	463	25.1	423	21.3	276	25.6
operate non-power hand tools								
Boys	2709	62.8	1543	58.7	1654	63.0	931	57.8
Girls	1606	37.2	1082	41.1	971	37.0	680	42.2
lifting/bending/twisting								
Boys	3048	57.5	1764	51.9	1902	55.3	1067	48.8
Girls	2251	42.5	1629	47.9	1533	44.6	1121	51.2
using chemicals								
Boys	1428	62.2	958	58.9	1027	60.1	630	55.0
Girls	868	37.8	667	41.0	682	39.9	514	44.9
drive car or truck								
Boys	1864	70.3	1162	65.7	1323	68.1	703	62.5
Girls	788	29.7	603	34.1	619	31.9	421	37.5
work with animals								
Boys	1108	59.7	748	59.3	650	63.6	377	61.4
Girls	745	40.2	512	40.6	371	36.3	237	38.6
climbing/working from heights								
Boys	1642	74.0	940	68.1	1131	73.9	585	67.3
Girls	577	26.0	438	31.7	399	26.1	283	32.6

Time Period Covered by Survey	June-August 2001		Sept.–May 2001-02		June-August 2002		Sept.– May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
work around hot surface								
Boys	1846	48.3	1197	46.5	1207	48.9	759	43.8
Girls	1975	51.7	1369	53.2	1259	51.1	972	56.2
Weekday mean sleep hours by work status and gender (all students)	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Did not work								
Boys	8.9	0.1	7.8	0.0	8.5	0.1	7.5	0.0
Girls	9.2	0.1	7.7	0.0	8.7	0.1	7.5	0.0
Worked								
Boys	8.6	0.0	7.7	0.0	8.2	0.0	7.5	0.0
Girls	8.9	0.0	7.6	0.0	8.6	0.0	7.5	0.0
Weekday mean sleep hours by work status and grade (all students)								
Did not work								
Grade 9	9.2	0.1	7.9	0.0				
Grade 10	8.9	0.1	7.7	0.0	8.8	0.1	7.7	0.1
Grade 11	8.9	0.1	7.7	0.1	8.4	0.1	7.5	0.1
Grade 12	8.9	0.4	6.9	0.3	8.3	0.1	7.3	0.1
Worked								
Grade 9	9.2	0.0	7.9	0.0				
Grade 10	8.8	0.0	7.6	0.0	8.8	0.0	7.7	0.0
Grade 11	8.5	0.0	7.5	0.0	8.4	0.0	7.5	0.0
Grade 12	8.0	0.1	7.4	0.2	8.1	0.0	7.3	0.0
Weekend mean sleep hours by work status and gender (all students)								
Did not work								
Boys	8.6	0.1	8.3	0.1	8.2	0.1	7.8	0.1
Girls	8.6	0.1	8.6	0.1	8.3	0.1	8.2	0.1
Worked								
Boys	8.3	0.0	8.0	0.0	8.0	0.0	7.7	0.1
Girls	8.4	0.0	8.3	0.0	8.2	0.0	8.0	0.0
Weekend mean sleep hours by work status and grade (all students)								
Did not work								
Grade 9	8.8	0.1	8.6	0.1				
Grade 10	8.4	0.1	8.3	0.1	8.5	0.1	8.2	0.1
Grade 11	8.5	0.1	8.3	0.1	8.0	0.1	8.0	0.1
Grade 12	8.9	0.5	7.2	0.5	7.9	0.1	7.7	0.1

Time Period Covered by Survey	June-August 2001		Sept.-May 2001-02		June-August 2002		Sept.- May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Worked								
Grade 9	8.7	0.0	8.5	0.1				
Grade 10	8.3	0.0	8.2	0.0	8.5	0.1	8.1	0.1
Grade 11	8.1	0.0	7.9	0.0	8.1	0.0	7.8	0.1
Grade 12	7.7	0.1	7.9	0.2	7.7	0.0	7.7	0.1
Weekday mean hours driving/driven to/from work/school by work status and gender								
Did not work								
Boys	1.6	0.1	1.9	0.1	2.1	0.1	2.0	0.1
Girls	1.5	0.1	1.7	0.1	1.8	0.1	1.8	0.1
Worked								
Boys	1.4	0.0	1.6	0.0	1.5	0.0	1.5	0.1
Girls	1.4	0.0	1.6	0.0	1.5	0.0	1.6	0.0
Weekday mean hours driving/driven to/from work/school by work status and grade								
Did not work								
Grade 9	1.4	0.1	1.8	0.1				
Grade 10	1.7	0.1	2.0	0.1	1.7	0.1	1.9	0.1
Grade 11	1.7	0.1	1.7	0.1	2.2	0.1	2.0	0.1
Grade 12	1.0	0.3	1.8	0.3	2.3	0.1	2.0	0.1
Worked								
Grade 9	1.2	0.0	1.6	0.1				
Grade 10	1.5	0.0	1.7	0.1	1.3	0.0	1.6	0.1
Grade 11	1.5	0.0	1.5	0.0	1.6	0.0	1.5	0.1
Grade 12	1.7	0.2	2.0	0.2	1.6	0.1	1.5	0.1
Weekend mean hours driving/driven to/from work/school by work status and gender								
Did not work								
Boys	1.3	0.1	1.6	0.1	1.8	0.1	1.7	0.1
Girls	1.3	0.1	1.4	0.1	1.5	0.1	1.6	0.1
Worked								
Boys	1.1	0.0	1.3	0.0	1.1	0.0	1.4	0.1
Girls	1.1	0.0	1.3	0.0	1.3	0.0	1.4	0.0
Weekend mean hours driving/driven to/from work/school by work status and grade								
Did not work								

Time Period Covered by Survey	June-August 2001		Sept.–May 2001-02		June-August 2002		Sept.– May 2002-03	
	N or Mean	% ¹ or SE	N or Mean	% or SE	N or Mean	% or SE	N or Mean	% or SE
Grade 9	1.2	0.1	1.3	0.1				
Grade 10	1.4	0.1	1.7	0.1	1.4	0.1	1.6	0.1
Grade 11	1.4	0.1	1.7	0.1	1.8	0.1	1.6	0.1
Grade 12	1.6	0.7	1.7	0.4	2.1	0.1	1.9	0.1
Worked								
Grade 9	0.9	0.0	1.1	0.0				
Grade 10	1.1	0.0	1.3	0.0	1.1	0.0	1.5	0.1
Grade 11	1.2	0.0	1.4	0.0	1.3	0.0	1.4	0.1
Grade 12	1.4	0.1	1.9	0.2	1.3	0.0	1.4	0.1
Worked by BMI (all students)								
Below 85th percentile ²	8269	79.9	4980	63.1	4760	71.6	3318	55.9
≥ 85th percentile	2691	78.9	1741	61.4	1599	68.3	883	51.2
Mean BMI by work status and gender (all students)								
Did not work								
Boys	24.4	0.5	26.0	0.5	27.4	0.7	29.1	0.7
Girls	22.0	0.3	22.0	0.3	24.5	0.8	23.8	0.5
Worked								
Boys	23.6	0.2	25.4	0.4	24.9	0.3	25.1	0.3
Girls	21.8	0.1	22.2	0.1	22.4	0.1	23.1	0.3
Mean BMI by work status and grade (all students)								
Did not work								
Grade 9	22.6	0.5	24.2	0.5				
Grade 10	23.2	0.3	24.2	0.5	25.4	0.7	26.5	0.7
Grade 11	25.3	1.0	24.6	0.7	26.9	1.0	27.6	0.9
Grade 12	23.4	0.9	28.0	2.5	27.6	1.2	27.4	0.9
Worked								
Grade 9	21.9	0.1	23.9	0.4				
Grade 10	22.9	0.2	23.5	0.3	23.2	0.3	23.8	0.4
Grade 11	23.1	0.2	23.8	0.3	23.5	0.3	23.8	0.3
Grade 12	25.4	1.5	23.9	0.7	24.0	0.3	24.3	0.4

¹% represents percent of all students or just working students (as indicated) in that category (row).

²Body Mass Index (BMI) percentiles were based on age and gender using CDC 2000 growth charts (<http://www.cdc.gov/growthcharts>).

Table 10. Adjusted¹ Prevalence Rates (%) of Work, Injuries, Asthma, and Selected Demographic Characteristics Among Rural Minnesota Teens

Time Period Covered by Survey	June – August 2001		September-May 2001-2002		June – August 2002		September-May 2002-2003	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Schools/students	41/13869		39/10945		38/9073		35/7802	
Percent of students engaged in paid or unpaid work								
Among all students	80.5	78.0 - 82.9	63.9	61.3 - 66.5	71.9	67.2 - 76.6	55.8	52.8 - 58.9
By Gender								
Boys	78.8	76.2 - 81.4	58.1	55.1 - 61.1	67.4	61.9 - 73.0	47.7	44.1 - 51.3
Girls	82.4	79.8 - 84.9	69.9	67.3 - 72.4	76.6	72.7 - 80.5	64.0	60.2 - 67.7
By Grade								
Grade 9 (freshmen)	75.0	70.8 - 79.1	55.6	51.6 - 59.6				
Grade 10 (sophomores)	76.4	73.2 - 79.6	61.0	56.5 - 65.4	63.1	57.6 - 68.6	47.7	44.4 - 51.1
Grade 11 (juniors)	89.3	87.7 - 90.9	74.8	71.7 - 78.0	72.5	67.6 - 77.3	59.0	55.3 - 62.8
Grade 12 (seniors) ²					81.5	75.9 - 87.0	61.8	57.2 - 66.5
By Age at time of survey								
≤14	75.8	71.8 - 79.8	55.6	50.8 - 60.4	53.3	27.8 - 78.9		
15	75.7	72.1 - 79.3	57.8	54.4 - 61.1	63.6	58.2 - 69.0	32.0	20.4 - 43.6
16	84.8	82.8 - 86.7	64.6	60.7 - 68.5	70.1	65.5 - 74.7	47.4	43.1 - 51.8
17	88.8	86.8 - 90.8	73.8	70.5 - 77.1	78.0	72.7 - 83.3	52.1	48.4 - 55.8
≥18	85.9	76.1 - 95.7	71.8	64.4 - 79.3	80.9	75.1 - 86.8	60.1	56.8 - 63.5
By Farm Residence								
Lived on farm	79.3	76.9 - 81.6	61.4	59.0 - 63.9	69.9	64.9 - 74.8	54.2	51.0 - 57.5
Did not live on farm	89.3	86.4 - 92.2	77.9	74.7 - 81.2	84.3	80.8 - 87.9	65.7	61.8 - 69.7
By Ethnicity								
Non-Hispanic	81.3	79.0 - 83.6	64.5	61.8 - 67.1	72.9	68.4 - 77.4	56.5	53.4 - 59.6
Hispanic	63.5	56.4 - 70.7	50.6	42.8 - 58.4	46.5	38.4 - 54.6	41.7	35.6 - 47.8
By Race								
African American/Black	58.2	49.1 - 67.3	40.7	28.2 - 53.1	38.8	24.7 - 52.8	33.8	26.2 - 41.3
Native American/Alaskan Native	74.4	67.0 - 81.8	51.5	38.0 - 65.0	64.9	50.8 - 79.0	38.9	23.7 - 54.1
Other/Mixed	73.9	69.3 - 78.4	66.2	57.9 - 74.5	49.1	39.8 - 58.4	41.1	31.4 - 50.7
Asian	70.6	61.6 - 79.6	48.1	39.7 - 56.5	37.5	19.4 - 55.6	43.5	37.0 - 49.9
Native Hawaiian/Pacific Islander	64.3	45.8 - 82.8	48.3	35.2 - 61.4	53.0	43.1 - 62.9	42.9	25.1 - 60.6
White/Caucasian	81.3	79.0 - 83.7	64.8	62.3 - 67.3	73.6	69.4 - 77.8	57.0	54.0 - 60.0

Time Period Covered by Survey	June – August 2001		September-May 2001-2002		June – August 2002		September-May 2002-2003	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
By Race/Ethnicity								
White-Non Hispanic	81.8	79.5 - 84.2	65.1	62.6 - 67.7	73.8	69.6-78.1	57.2	54.1 - 60.3
Black-Non Hispanic	62.5	53.1 - 71.9	38.4	28.2 -48.5	42.7	24.8 -60.6	34.5	26.9 -42.2
Hispanic	63.5	56.4 -70.7	50.6	42.8 -58.4	46.5	38.4-54.6	41.7	35.6 -47.8
Native American-Non Hispanic	75.8	68.4 -83.1	55.0	38.1 -72.0	63.3	47.1-79.5	39.5	22.7 -56.4
Other Non Hispanic	74.1	68.9 -79.3	55.3	47.7 -62.8	57.6	50.2 -65.0	45.6	37.4 -53.8
Other-unknown ethnicity	72.9	64.9 -81.0	58.1	52.4 -63.8	63.9	56.6-71.2	48.1	39.3 -56.9
Prevalence Rates (%) of one or more injuries during survey time period								
One or more injuries, Among all students	8.0	7.4 -8.7	8.2	7.4 -8.9	4.0	3.4 -4.7	4.5	3.2 -5.9
Prevalence of Injuries by Number of Injuries								
1	5.0	4.5 -5.5	4.8	4.3 -5.3	2.7	2.2 -3.2	3.1	2.0 -4.1
2-4	2.7	2.3 -3.0	2.8	2.3 -3.3	1.1	0.9 -1.4	1.2	0.9 -1.5
Any Injury By Gender								
Boys	8.4	7.6 -9.3	8.3	7.4 -9.2	4.0	3.1-4.8	4.1	2.5 -5.6
Girls	7.7	6.9 -8.5	8.1	7.0 -9.2	4.1	3.4 -4.8	5.0	3.6 -6.4
Any Injury By Age								
≤14	9.9	8.3 -11.4	8.7	6.4 -11.0	6.7	0.0 -20.2		
15	7.9	6.7 -9.0	9.7	8.5 -10.9	4.9	3.9 -5.9	1.5	0.0 -4.0
16	7.4	6.5 -8.3	7.7	6.8 -8.6	3.4	2.6 -4.2	7.6	4.1 -11.0
17	7.5	6.2 -8.7	6.8	5.4 -8.2	3.8	2.8 -4.8	4.5	3.0 -5.9
≥18	5.9	2.1 -9.8	4.8	1.5 -8.2	4.7	3.1 -6.2	4.1	2.8 -5.3
Any Injury By Farm Residence								
Lived on farm	7.9	7.3 -8.6	8.1	7.3 -8.9	3.8	3.2 -4.5	4.7	3.1 -6.2
Did not live on farm	9.1	7.6 -10.7	8.5	7.0 -10.1	5.4	3.7 -7.0	3.8	2.6 -5.1
Any Injury By Work Status								
Worked	6.8	5.4 -8.3	8.3	6.8 -9.8	2.7	1.8 -3.6	4.2	2.3 -6.2
Did not work	8.3	7.7 -9.0	8.0	7.1 -9.0	4.6	3.8 -5.3	4.8	3.8 -5.8
Any Injury by Where Injury Occurred								
Work/Chore	1.8	1.4 -2.2	1.3	1.0 -1.5	1.3	1.0 -1.7	0.8	0.5 -1.1
School	0.7	0.5 -0.9	2.2	1.9 -2.5	0.3	0.1 -0.4	1.3	0.9 -1.7
Other activity	5.8	5.2 -6.3	5.1	4.4 -5.8	2.5	1.9 -3.0	2.4	1.3 -3.6

Time Period Covered by Survey	June – August 2001		September-May 2001-2002		June – August 2002		September-May 2002-2003	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Percent of students who currently smoke								
All Students	12.7	11.6 - 13.8	13.3	11.9 - 14.7	13.8	12.3 - 15.3	13.7	12.3 - 15.2
Boys	11.8	10.7 - 12.9	12.3	10.6 - 13.9	13.4	11.4 - 15.4	12.9	11.3 - 14.5
Girls	13.7	12.3 - 15.1	14.3	12.8 - 15.9	14.1	12.6 - 15.6	14.6	12.8 - 16.4
Percent of students who smoked during survey period								
All Students	12.7	11.7 - 13.8	13.8	12.4 - 15.2	13.8	12.3 - 15.2	14.1	12.7 - 15.5
Boys	11.9	10.8 - 13.1	12.7	11.1 - 14.4	13.5	11.5 - 15.4	13.3	11.5 - 15.0
Girls	13.6	12.2 - 14.9	14.8	13.2 - 16.3	14.1	12.5 - 15.7	14.9	13.1 - 16.6
Percent of students who drove a motor vehicle during survey period								
All Students	71.1	68.6 - 73.6	78.4	76.0 - 80.8	85.5	83.3 - 87.7	88.8	87.3 - 90.3
Boys	77.1	74.8 - 79.3	81.8	79.4 - 84.2	86.8	84.7 - 89.0	89.8	88.6 - 91.0
Girls	65.0	61.8 - 68.1	75.0	72.3 - 77.7	84.3	81.4 - 87.1	87.9	86.0 - 89.8
Percent of students who "always" used a seatbelt								
All Students	54.1	51.3 - 56.9	53.7	50.2 - 57.3	55.8	51.8 - 59.8	57.6	53.1 - 62.1
Boys	48.1	45.3 - 50.9	47.3	44.0 - 50.7	48.3	44.0 - 52.5	50.6	45.8 - 55.4
Girls	60.3	57.2 - 63.4	60.3	56.1 - 64.5	63.6	59.4 - 67.8	64.6	59.7 - 69.6
Percent of students who lived on a farm at the time of the survey								
All Students	13.6	10.2 - 17.0	14.9	11.4 - 18.5	14.5	10.6 - 18.4	14.0	10.2 - 17.7
Boys	15.0	11.4 - 18.6	16.4	12.6 - 20.1	15.9	11.8 - 20.0	15.1	11.3 - 18.9
Girls	12.2	8.9 - 15.4	13.5	10.0 - 16.9	13.0	9.2 - 16.8	12.8	9.0 - 16.5
Percent of students who consumed alcoholic drinks on ≥one day during survey period								
All Students	40.3	37.5 - 43.1	43.8	40.8 - 46.7	45.3	41.3 - 49.3	46.9	42.6 - 51.1
Boys	40.0	36.8 - 43.2	44.0	40.5 - 47.4	46.5	42.5 - 50.5	48.5	43.7 - 53.2
Girls	40.7	38.1 - 43.2	43.5	40.6 - 46.4	43.9	39.3 - 48.6	45.3	41.1 - 49.5
Percent of students with a BMI > 85th percentile								
All Students	24.8	23.8 - 25.7	26.4	25.5 - 27.3	26.0	24.8 - 27.2	22.5	21.7 - 23.3
Boys	31.7	30.6 - 32.9	34.8	33.9 - 35.6	34.2	32.9 - 35.6	29.9	28.6 - 31.3
Girls	17.5	16.2 - 18.9	17.8	16.2 - 19.3	17.5	15.9 - 19.2	15.1	13.9 - 16.4
Percent of students with wheeze past 12 months								
All Students	17.5	16.6 - 18.3	16.9	16.0 - 17.8	14.0	13.1 - 14.8	13.1	12.1 - 14.0
Boys	15.4	14.2 - 16.5	14.8	13.7 - 15.9	11.8	10.7 - 12.8	11.8	10.3 - 13.2
Girls	19.7	18.5 - 20.9	19.1	17.9 - 20.2	16.2	15.0 - 17.5	14.3	12.8 - 15.8

Time Period Covered by Survey	June – August 2001		September-May 2001-2002		June – August 2002		September-May 2002-2003	
	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Percent of students with wheeze during exercise past 12 months								
All Students	21.1	20.0 - 22.1	20.3	19.2 - 21.4	16.1	15.1 - 17.1	15.2	14.0 - 16.4
Boys	17.2	15.9 - 18.5	16.6	15.3 - 17.8	13.0	11.7 - 14.3	13.2	11.5 - 14.8
Girls	25.1	23.7 - 26.5	24.1	22.6 - 25.7	19.2	17.7 - 20.7	17.2	15.6 - 18.8
Percent of students with doctor ever told they have asthma								
All Students	12.7	11.8 - 13.6	12.4	11.5 - 13.3	11.1	10.2 - 11.9	10.3	9.5 - 11.2
Boys	12.3	11.2 - 13.5	11.6	10.5 - 12.7	10.1	8.9 - 11.3	9.4	8.1 - 10.8
Girls	13.0	11.8 - 14.1	13.2	11.9 - 14.4	12.0	10.9 - 13.1	11.2	10.0 - 12.3
By Grade								
Grade 9 (freshmen)	12.7	11.4 - 14.0	12.9	11.2 - 14.6				
Grade 10 (sophomores)	12.5	11.3 - 13.7	12.2	10.9 - 13.5	11.9	10.7 - 13.1	11.0	9.6 - 12.4
Grade 11 (juniors)	12.7	11.2 - 14.3	12.2	10.5 - 13.9	10.6	9.0 - 12.2	10.2	8.8 - 11.6
Grade 12 (seniors) ²					10.6	9.2 - 12.0	9.6	7.8 - 11.3
By Age at time of survey								
≤14	12.9	11.3 - 14.5	13.7	11.1 - 16.3	7.7	0.0 - 22.8		
15	12.4	11.4 - 13.3	12.9	11.4 - 14.4	12.3	10.9 - 13.7	14.3	6.9 - 21.7
16	13.1	11.6 - 14.6	12.5	11.7 - 13.2	10.2	8.9 - 11.6	11.1	8.9 - 13.3
17	12.0	10.2 - 13.8	11.5	9.2 - 13.7	11.8	10.7 - 13.0	11.2	9.8 - 12.6
≥18	12.7	9.0 - 16.4	8.0	4.7 - 11.2	8.1	5.9 - 10.3	9.6	8.4 - 10.8
Percent of students who report still having asthma (current asthma)								
All Students	9.4	8.8 - 10.1	9.3	8.6 - 10.0	8.1	7.5 - 8.7	7.5	6.8 - 8.2
Boys	8.7	7.9 - 9.4	8.3	7.5 - 9.1	6.8	5.9 - 7.6	6.5	5.4 - 7.5
Girls	10.2	9.2 - 11.2	10.7	9.6 - 11.7	9.5	8.7 - 10.4	8.8	7.7 - 9.9

¹Prevalence figures and confidence intervals are adjusted to account for the stratified sampling by geographic region and school size. For the first two, most complete surveys, these figures should be generally representative of students in rural Minnesota public high schools.

²One school inadvertently included seniors in the first two surveys; these data are not shown since they are not representative of the population and an adjusted prevalence and confidence interval cannot be calculated.

Table 11. Selected Variables by Survey Period and School Size¹

	Small	Medium	Large	Signif.
<u>Summer 2001</u>				
Live on a Farm (%)	25.2	17.6	7.6	p<0.0001
Any Injury (%)	9.3	8.6	9.8	p=0.307
Any Work (%)	89.2	78.5	79.3	p<0.0001
Current Smoker (%)	11.1	13.5	12.7	p=0.033
Ever Told Asthma (%)	10.8	13.2	12.9	p=0.031
Mean Week Day Hours Worked	10.1	7.8	7.4	p<0.0001
Mean Weekend Hours Worked	8.5	6.6	6.5	p<0.0001
<u>School Year 2001-02</u>				
Live on a Farm (%)	25.7	17.6	7.8	p<0.0001
Any Injury (%)	10.5	9.1	9.1	p=0.09
Any Work (%)	68.1	64.2	61.8	p<0.0001
Current Smoker (%)	11.9	14.0	13.2	p=0.069
Ever Told Asthma (%)	10.2	12.8	13.0	p=0.010
Mean Week Day Hours Worked	4.8	4.0	3.8	p<0.0001
Mean Weekend Hours Worked	6.5	5.6	5.2	p<0.0001
<u>Summer 2002</u>				
Live on a Farm (%)	24.2	15.8	6.9	p<0.0001
Any Injury (%)	6.3	4.6	4.7	p=0.027
Any Work (%)	81.1	70.0	69.3	p<0.0001
Current Smoker (%)	11.1	14.7	14.0	p=0.001
Ever Told Asthma (%)	9.1	11.4	11.7	p=0.022
Mean Week Day Hours Worked	8.8	6.8	6.2	p<0.001
Mean Weekend Hours Worked	7.5	5.9	5.6	p<0.001
<u>School Year 2002-03</u>				
Live on a Farm (%)	23.1	15.2	5.9	p<0.0001
Any Injury (%)	5.6	4.1	6.3	p=0.002
Any Work (%)	57.0	54.4	57.3	p<0.050
Current Smoker (%)	12.9	14.4	13.3	p=0.288
Ever Told Asthma (%)	9.9	10.1	10.9	p=0.528
Mean Week Day Hours Worked	3.6	3.4	3.6	p<0.194
Mean Weekend Hours Worked	5.3	4.7	5.0	p<0.027

¹Small = 90-169 students; Medium = 170-560 students; and Large = 561-1600 students.

Table 12. Recall Bias Findings: Agreement on Reported Injury and Work Experience between Midyear Recall Survey and Subsequent Spring Survey

a. Any reported injury during the period September-December

		Midyear Recall Questionnaire		Total
		Yes	No	
Spring Questionnaire	Yes	7	5	12
	No	28	343	371
Total		35	348	383

Missing = 2

Sensitivity = 0.200

Specificity = 0.986

Kappa = 0.264 (SE = 0.044)

b. Any reported work during the period September –December

		Midyear Recall Questionnaire		Total
		Yes	No	
Spring Questionnaire	Yes	153	15	168
	No	87	115	202
Total		240	130	370

Missing = 15

Sensitivity = 0.638

Specificity = 0.885

Kappa = 0.463 (SE = 0.048)

Table 13. Injury Rates¹ for Specific Time Periods for Midyear Recall and Spring Surveys

Survey and Number of Participants	% of Students Reporting Any Injury During Previous Indicated Time Period		
	September-December	January-May	Overall (Sept.-May)
Recall Participant Responses from Midyear (Recall) Survey ² - January 2003			
Total (N=383)	9.1	-	-
Boys (N=188)	11.7	-	-
Girls (N=195)	6.7	-	-
Recall Participant Responses from Spring 2003 Survey			
Total (N=385)	3.1	3.6	5.6
Boys (N=188)	2.7	3.7	4.9
Girls (N=197)	3.6	3.6	6.3
Non-Recall Participants from Spring 2003 Survey			
Total (N=7288)	2.8	2.8	5.1
Boys (N=3650)	2.8	2.4	4.9
Girls (N=3638)	3.0	3.3	5.3
All Participants from Spring Survey from Previous Year (Spring 2002 Survey)			
Total (N=10738)	5.8	5.5	9.4
Boys (N=5459)	6.2	5.7	9.6
Girls (N=5279)	5.5	5.4	9.1

¹Defined as the percent of students who had any reported injury during the specified months.

²As noted in text, the Midyear Recall Survey was completed by 568 students, but only 385 could be definitively matched to the subsequent Spring Survey. Prevalence of injuries reported for all 568 students were: Total=10.9%, Boys=12.4%, Girls=9.1%.

Table 14. Comparison of Cohort¹ to Non-Cohort Group, First Year Surveys

Variable		June-August 2001 Survey		September-May 2001-02 Survey	
		Cohort N (%)	Non-Cohort N (%)	Cohort N (%)	Non-Cohort N (%)
Gender	Boys	2801 (49.9)	4231 (51.9)	2801 (49.9)	2658 (51.9)
	Girls	2817 (50.1)	3920 (48.1)	2817 (50.1)	2462 (48.1)
		$\chi^2=5.6, p=0.018$		$\chi^2=4.5, p=0.033$	
Grade	9	1884 (33.5)	2619 (32.9)	1874 (33.5)	1576 (31.3)
	10	2042 (36.3)	2513 (31.6)	2037 (36.4)	1682 (33.4)
	11	1692 (30.1)	2832 (35.6)	1688 (30.1)	1783 (35.4)
		$\chi^2=52.3, p<0.001$		$\chi^2=33.1, p<0.001$	
Injured	Yes	441 (8.2)	787 (10.1)	503 (9.4)	450 (9.3)
	No, Not by Def.	4960 (91.8)	6968 (89.9)	4867 (90.6)	4392 (90.7)
		$\chi^2=15.0, p<0.001$		$\chi^2=0.02, p=0.899$	
Worked	Yes	4577 (82.1)	6409 (79.3)	3610 (65.3)	3147 (62.3)
	No	997 (17.9)	1672 (20.7)	1916 (34.7)	1908 (37.7)
		$\chi^2=16.5, p<0.001$		$\chi^2=10.8, p=0.001$	
Farm Residence	Yes	963 (17.3)	888 (11.0)	948 (17.1)	636 (12.6)
	No	4594 (82.7)	7170 (89.0)	4601 (82.9)	4416 (87.4)
		$\chi^2=111.5, p<0.001$		$\chi^2=42.0, p<0.001$	
Grades	A's, B's	4064 (74.4)	5066 (64.7)	3957 (72.4)	3092 (62.8)
	Other, Unk.	1401 (25.6)	2769 (35.3)	1508 (27.6)	1833 (37.2)
		$\chi^2=140.9, p<0.001$		$\chi^2=110.0, p<0.001$	
Smoke	Yes	448 (8.1)	1264 (15.9)	527 (9.6)	870 (17.5)
	No	5065 (91.9)	6672 (84.1)	4989 (90.4)	4108 (82.5)
		$\chi^2=178.2, p<0.001$		$\chi^2=142.3, p<0.001$	
Seat Belt	Always	3030 (54.8)	4279 (53.6)	3044 (55.0)	2609 (52.3)
	Other	2499 (45.2)	3698 (46.4)	2486 (45.0)	2380 (47.7)
		$\chi^2=1.77, p=0.18$		$\chi^2=8.0, p=0.005$	
Asthma	Yes	621 (12.4)	918 (12.8)	608 (12.0)	597 (12.9)
	No	4375 (87.6)	6227 (87.2)	4470 (88.0)	4029 (87.1)
		$\chi^2=0.5, p=0.496$		$\chi^2=1.9, p=0.164$	

¹The "cohort" is the subgroup (N=5,618) of study participants for whom all four surveys could be identified.

Table 15. Cumulative Injury and Work Experiences of the Cohort¹

Outcome	N	%	Diff./Trend
Any Work on Any Survey (N=5618)			
Yes	5215	92.8	
Any Work by Gender			
Boy	2544	90.8	$\chi^2=5.6$ p=0.018
Girl	2671	94.8	
Any Work by Grade²			
Grade 9	1676	89.0	$\chi^2_{trend}=93.1$ p<0.0001
Grade 10	1892	92.7	
Grade 11	1647	97.3	
Any Work on All Four Surveys (N=5618)			
Yes	2112	37.6	
Work on All Four Surveys by Gender			
Boy	857	30.6	$\chi^2=116.6$ p<0.0001
Girl	1255	44.6	
Work on All Four Surveys by Grade			
Grade 9	543	28.8	$\chi^2_{trend}=139.8$ p<0.0001
Grade 10	756	37.0	
Grade 11	813	48.1	
Any Agricultural Work on Any Survey (N=5618)			
Yes	1429	25.4	
Any Ag. Work by Gender			
Boy	943	33.7	$\chi^2=199.5$ p<0.0001
Girl	486	17.3	
Any Ag. Work by Grade			
Grade 9	518	27.5	$\chi^2_{trend}=1.3$ p=0.25
Grade 10	472	23.1	
Grade 11	439	26.0	
Any Ag. Work on All Four Surveys (N=5618)			
Yes	253	4.5	
Any Ag. Work on All Surveys by Gender			
Boy	178	6.4	$\chi^2=44.5$ p<0.0001
Girl	75	2.7	
Any Ag. Work on All Surveys by Grade			
Grade 9	88	4.7	

Outcome	N	%	Diff./Trend
Grade 10	78	3.8	$\chi^2_{\text{trend}}=0.4$ p=0.54
Grade 11	87	5.1	
Any Injury (N=5618)			
Yes	1007	17.9	
Sum of Injuries/Student			
0	4610	82.1	
1	546	9.7	
2	238	4.2	
3	94	1.7	
4	69	1.2	
5-12	60	1.1	
Any Injury by Gender			
Boy	513	18.3	$\chi^2=0.6$ p=0.45
Girl	494	17.5	
Any Injury by Grade			
Grade 9	382	20.3	$\chi^2_{\text{trend}}=8.4$ p=0.004
Grade 10	343	16.8	
Grade 11	282	16.7	
Any Work-Related Injury (N=5215 who worked)			
Yes	239	4.6	
Sum of Work Injuries/Student			
0	4976	95.4	
1	157	3.0	
2	51	1.0	
≥3	30	0.6	
Any Work Injury by Gender			
Boy	136	5.4	$\chi^2=6.6$ p=0.01
Girl	103	3.9	
Any Work Injury by Grade			
Grade 9	66	3.9	$\chi^2_{\text{trend}}=4.9$ p=0.03
Grade 10	81	4.3	
Grade 11	92	5.6	
Any School Injury (N=5618)			
Yes	252	4.5	
Sum of School Injuries/Student			
0	5366	95.5	

Outcome	N	%	Diff./Trend
1	179	3.2	
2	45	0.8	
3-6	28	0.5	
Any School Injury by Gender			
Boy	133	4.8	$\chi^2=0.9$ p=0.34
Girl	119	4.2	
Any School Injury by Grade			
Grade 9	106	5.6	$\chi^2_{trend}=8.7$ p=0.003
Grade 10	85	4.2	
Grade 11	61	3.6	
Any Other Injury (N=5618)			
Yes	701	12.5	
Sum of Other Injuries/Student			
0	4917	87.5	
1	425	7.6	
2	161	2.9	
3	48	0.9	
4	40	0.7	
5-9	27	0.5	
Any Other Injury by Gender			
Boy	346	12.4	$\chi^2=0.1$ p=0.78
Girl	355	12.6	
Any Other Injury by Grade			
Grade 9	283	15.0	$\chi^2_{trend}=15.2$ p<0.0001
Grade 10	236	11.6	
Grade 11	182	10.8	
Any Agricultural Work Injury (50 missing, N=5165)			
Yes	128	2.5	
Sum of Ag. Injuries/Student			
0	5037	97.5	
1	96	1.9	
2	20	0.4	
3 - 7	12	0.2	
Any Ag. Injury by Gender			
Boy	98	3.9	$\chi^2=41.2$ p<0.0001
Girl	30	1.1	

Outcome	N	%	Diff./Trend
Any Ag. Injury by Grade			
Grade 9	51	3.1	$\chi^2_{\text{trend}}=0.6$ p=0.44
Grade 10	33	1.8	
Grade 11	44	2.7	

¹The “cohort” is defined as the population of students for whom all four surveys could be matched. The total size of this cohort was 5,618 although missing data may reduce this number when examining specific outcomes.

²Grade is the grade student was in at the first survey; only students in grades 9 through 11 were surveyed during the first year and could be followed through the second year.

Table 16. Adjusted¹Odds Ratios for Work-Related Injuries, First Year Surveys

	Survey Period June-August 2001		Survey Period September-May 2001-02	
	OR ²	(95% CI)	OR ²	(95% CI)
Age				
(per year of increase)	1.02	(0.93, 1.12)	1.25	(1.08, 1.43)
Sex				
(Boys vs. Girls)	1.61	(1.32, 1.95)	0.88	(0.66, 1.18)
Current smoking				
(Yes vs. No)	1.68	(1.34, 2.11)	2.38	(1.76, 3.22)
Agricultural Job				
(Yes vs. Non-Ag. Job)	1.89	(1.45, 2.47)	2.06	(1.35, 3.15)
Reside on a Farm				
(Yes vs. No)	1.37	(1.05, 1.79)	1.21	(0.83, 1.76)
Race				
(Non-White vs. White)	0.87	(0.55, 1.39)	1.42	(0.81, 2.49)
Body Mass Index (BMI)				
(≥85 th percentile vs. <85 th)	1.24	(1.02, 1.52)	1.51	(1.13, 2.00)
Mean Sleep Hours/Week				
(≤ 60 vs. ≥ 60)	1.42	(1.18, 1.72)	0.95	(0.64, 1.43)
Total Work Hours Index ³				
Lowest Third (ref. Category)	1.00		1.00	
Middle Third	2.03	(1.50, 2.73)	1.42	(0.85, 2.36)
Highest Third	3.56	(2.75, 4.60)	2.49	(1.65, 3.76)

¹Adjusted for variables in the table; school size and agricultural region were not significant variables when included in this model and did not affect OR's for other factors.

²OR = Odds Ratio; CI = Confidence interval

³This is a relative index derived by calculating the product of "typical hours" worked per day and the number of days between the job start date and end date. Product was then divided into lowest, middle and upper thirds (tertiles). See text for limitations of this measure.

Table 17. Inclusion Enrollment Report

Study Title: Childhood Agricultural Trauma Evaluation System

Total Enrollment: 13,868

Protocol Number: NA

Grant Number: 5 R01 OH004265-4

PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative) by Ethnicity and Race				
Ethnic Category	Sex/Gender			Total
	Females	Males	Unknown or Not Reported	
Hispanic or Latino	226	229	4	459 **
Not Hispanic or Latino	6,332	6,584	19	12,935
Unknown (individuals not reporting ethnicity)	165	180	129	474
Ethnic Category: Total of All Subjects*	6,723	6,993	152	13,868 *
Racial Categories				
American Indian/Alaska Native	100	116	0	216
Asian	86	67	2	155
Native Hawaiian or Other Pacific Islander	14	18	0	32
Black or African American	41	86	5	132
White	6,148	6,306	24	12,478
More Than One Race	109	99	6	214
Unknown or Not Reported	225	301	115	641
Racial Categories: Total of All Subjects*	6,723	6,993	152	13,868 *
PART B. HISPANIC ENROLLMENT REPORT: Number of Hispanics or Latinos Enrolled to Date (Cumulative)				
Racial Categories	Females	Males	Unknown or Not Reported	Total
American Indian or Alaska Native	8	8	0	16
Asian	1	5	1	7
Native Hawaiian or Other Pacific Islander	4	1	0	5
Black or African American	3	13	0	16
White	73	81	1	155
More Than One Race	13	14	2	29
Unknown or Not Reported	124	107	0	231
Racial Categories: Total of Hispanics or Latinos**	226	229	4	459 **

* These totals must agree.

** These totals must agree.

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Appendix A

Student Questionnaire

(Version Administered in Fall Covering Events from Previous Summer)

Tear off this sheet After survey is completed.

YOUTH AT WORK: INJURY SURVEY

MARKING INSTRUCTIONS

- Use a #2 pencil.
- Make heavy dark marks that fill the circle completely.
- Erase cleanly any answer you wish to change.
- Make no stray marks on this questionnaire.

CORRECT MARK



INCORRECT MARKS



**Place Student
Label Here**



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DO NOT WRITE IN THIS SHADED AREA

DEMOGRAPHICS

1. Today's Date

Mo.	Day	Year
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	
6	6	
7	7	
8	8	
9	9	

Your Birth Date

Mo.	Day	Year
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

2. What gender are you?

- Male Female

3. What grade are you in?

- 9th 10th 11th 12th

4. Are you of Hispanic or Latino origin or descent?

- Hispanic or Latino
 Not Hispanic or Latino

5. Which of these groups BEST describes you?

(Mark one or more.)

- African American or Black
 American Indian or Alaskan Native
 Asian
 Native Hawaiian/Pacific Islander
 White or Caucasian
 Other (please specify) _____

6. Do you live on a farm or a ranch that is actively involved in agricultural production?

A Farm is defined as any place that would produce or sell \$1,000 or more of agricultural products.

- Yes No (SKIP TO question 7)



A. If YES, what type of farming or ranching is done?

(Please choose major activities that apply):

- Beef cattle
 Hogs
 Row crops (corn, soybeans, sugar beets)
 Dairy
 Small grains
 Turkeys, poultry
 Other (please specify) _____

YOUR ACTIVITIES

Questions 7-18 ask about how much time you spent in different activities such as school, sleeping, and sports during the months of **June, July and August**.

SCHOOL ACTIVITIES

School Time: This category includes all hours spent in classroom activities (do not include extracurricular activities) including time spent outside of regular school hours doing homework.

EXAMPLE: If you usually arrived on school property at 8:30 in the morning, you would fill in the circles like this example.

Time:	<input checked="" type="radio"/> Morning (A.M.) <input type="radio"/> Evening (P.M.)
Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input checked="" type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input checked="" type="radio"/> 30 <input type="radio"/> 45

7. Did you attend summer school during the months of June, July and August? Do not include any days in June spent in the regular school calendar.

- Yes No (SKIP TO page 5, question 11)



8. What was the usual time you arrived on school property?

Time:	<input type="radio"/> Morning (A.M.) <input type="radio"/> Evening (P.M.)
Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

9. What was the usual time you left school property?

Time:	<input type="radio"/> Morning (A.M.) <input type="radio"/> Evening (P.M.)
Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

10. Approximately how many hours of homework did you typically have each day during June, July and August?

- None 3 hours 6 hours
 1 hour 4 hours 7 hours
 2 hours 5 hours 8 hours

SLEEP AND OTHER ACTIVITIES

Please answer questions 11-18 to describe an average DAY during the months of June, July and August. Please read the following definitions to help you answer these questions:

Sleep: The time you spent sleeping at night.

Other Activities: This refers to all non-work or school activities that you may have been involved in during June, July and August such as:

- > Time spent driving or being transported to school, work, etc.
- > Time spent in extracurricular activities such as organized sports, supervised club activities.
- > Time spent in recreational activities such as horseback riding, ATV riding, non-supervised sporting activities.

11. What time did you usually get up on WEEKDAYS (Monday through Friday) in June, July and August?

Time:	<input type="radio"/> Morning (A.M.) <input type="radio"/> Evening (P.M.)
Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

12. What time did you usually go to sleep on WEEKDAYS (Sunday through Thursday nights) in June, July and August?

Time:	<input type="radio"/> Morning (A.M.) <input type="radio"/> Evening (P.M.)
Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

13. What is the average number of hours and minutes of sleep you got on WEEKNIGHTS (Sunday through Thursday) in June, July and August?

Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

14. What is the average number of hours and minutes of sleep you got on WEEKEND NIGHTS (Friday and Saturday) in June, July and August?

Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

15. What is the average number of hours and minutes you spent driving or being driven to and from school or work on a TYPICAL WEEKDAY (Monday through Friday) in June, July and August?

No time spent in transportation

Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

16. What is the average number of hours and minutes you spent driving or being driven to and from school or work on a TYPICAL WEEKEND (Saturday and Sunday) in June, July and August?

No time spent in transportation

Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

17. What is the average number of hours and minutes you spent in organized sports, and/or supervised club activities on a TYPICAL DAY in June, July and August?

No time spent in organized sports, or supervised club activities

Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45

18. What is the average number of hours and minutes you spent in recreational sports, and/or unsupervised activities on a TYPICAL DAY in June, July and August?

No time spent in recreational sports or unsupervised activities

Hours:	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 <input type="radio"/> 11 <input type="radio"/> 12 <input type="radio"/> 13 <input type="radio"/> 14
Minutes:	<input type="radio"/> 00 <input type="radio"/> 15 <input type="radio"/> 30 <input type="radio"/> 45



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WORK ACTIVITIES

Questions 19-27 refer to work you did during the Months of **June, July and August**. Work includes:

- Paid or unpaid employment either at or away from your home.
- Chores or work done for your family, such as lawn care, babysitting, dishes.
- Chores or work done outside of your home.
- Seasonal activities such as working harvest or lifeguarding.

19. Based on the definitions above, did you work during the months of June, July and August?

- Yes No (SKIP TO page 8, question 28)



Job Descriptions/Codes List

<p>Personal services</p> <p>01. lawn care 02. babysitting 03. maid/housekeeper 04. clean-up/janitorial worker 05. day care/child care worker 06. delivery person 07. car wash worker</p> <p>Restaurant/fast food</p> <p>08. car hop or fast food server 09. cook - fast food 10. waitress/waiter 11. buser 12. dishwasher 13. hostess/host</p>	<p>Retail</p> <p>14. cashier 15. stock clerk 16. sales clerk 17. station attendant 18. grocery bagger</p> <p>Professional/medical</p> <p>19. veterinarian's helper 20. teacher or teacher's aide 21. hospital orderly/nursing home assistant/personal care assistant 22. receptionist/office staff 23. computer operator/programmer</p> <p>Construction/manufacturing/food processing</p> <p>24. laborer 25. line worker</p>	<p>Entertainment/recreation</p> <p>26. amusement park attendant 27. lifeguard 28. recreation leader/camp counselor/sports instructor 29. dockhand 30. special events/activities (e.g., State Fair booth employee)</p> <p>Agricultural activities</p> <p>31. Work done on a farm under the supervision/employment of a farmer 32. Work done on a farm as a service to the farmer, but under the supervision of an agri-business provider</p> <p>33. Other _____</p>
--	---	--

Please include information on all your work and chores below. We have provided space for **FOUR** types of work or chores.

20. What type of work or chores did you do during June, July and August? (enter 2-digit code from the list above)

JOB 1	JOB 2	JOB 3	JOB 4
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

21. What is the average number of hours you worked on a **TYPICAL WEEKDAY OR NIGHT** in June, July and August?

JOB 1	<input type="text"/>
JOB 2	<input type="text"/>
JOB 3	<input type="text"/>
JOB 4	<input type="text"/>

22. What is the average number of hours you worked on a **TYPICAL WEEKEND DAY OR NIGHT** in June, July and August?

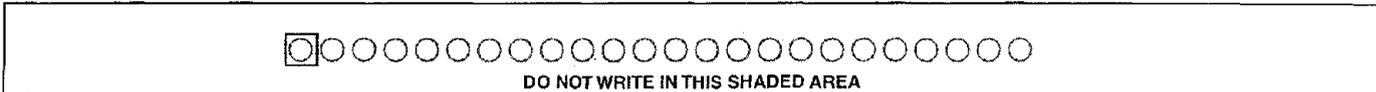
JOB 1	<input type="text"/>
JOB 2	<input type="text"/>
JOB 3	<input type="text"/>
JOB 4	<input type="text"/>

23. For each job or chore you worked, please mark your approximate start and end date. If you are still working at this job or chore, mark the currently working response instead of end date.

JOB 1				JOB 2				JOB 3				JOB 4			
Start Date		End Date													
Mo.	Day														
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	INJURY 1	INJURY 2	INJURY 3	INJURY 4
<p>30. In what month did your injury or accident occur?</p> <p>a. June b. July c. August</p>	<p>(a) (b) (c)</p>	<p>(a) (b) (c)</p>	<p>(a) (b) (c)</p>	<p>(a) (b) (c)</p>
<p>31. What body part(s) were injured? (Please mark all that apply.)</p> <p>a. Face/Nose b. Eyelid/Eye c. Head/Scalp d. Teeth e. Shoulder f. Arm/Elbow g. Wrist/Hand/Finger h. Upper Back/Neck i. Mid/Lower Back j. Hip/Leg k. Ankle/Foot/Toe l. Lungs m. Ribs/Chest n. Abdomen/Groin</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n)</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n)</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n)</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n)</p>
<p>32. What type of injury did you have? (Please mark all that apply.)</p> <p>a. Bruise/Abrasion b. Cut c. Burn d. Concussion/Loss of Consciousness e. Bite/Sting f. Strain/Sprain g. Fracture/Dislocation h. Chemical exposure i. Other</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i)</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i)</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i)</p>	<p>(a) (b) (c) (d) (e) (f) (g) (h) (i)</p>
<p>33. Were you treated by any of the following as a result of this event? (Please mark all that apply.)</p> <p>a. Physician b. Nurse/Nurse Practitioner/Physician's Assistant c. Chiropractor d. Dentist e. Physical Therapist f. No Professional Treatment</p>	<p>(a) (b) (c) (d) (e) (f)</p>	<p>(a) (b) (c) (d) (e) (f)</p>	<p>(a) (b) (c) (d) (e) (f)</p>	<p>(a) (b) (c) (d) (e) (f)</p>

	INJURY 1	INJURY 2	INJURY 3	INJURY 4
<p>34. As a result of this injury or accident, have you had any permanent disabling problems?</p> <p>a. No permanent disabling problems b. Limited ability to use hand(s)/ finger(s) c. Loss of all or part of finger(s) d. Loss of hand(s) e. Loss of other body part f. Hearing Loss g. Loss of sight, impaired sight h. Limited ability to move arm(s) i. Limited ability to move leg(s) j. Scarring k. Chronic pain</p>	a b c d e f g h i j k	a b c d e f g h i j k	a b c d e f g h i j k	a b c d e f g h i j k
<p>35. As a result of this injury or accident, how long were your normal activities restricted? <i>Normal activities are things that you would expect to do on a regular basis.</i></p> <p>a. Not restricted b. 1 day or less c. 1 day to 1 week d. 8 days to 2 weeks e. 15 days to 1 month f. More than 1 month g. Unsure/activities are still restricted</p>	a b c d e f g	a b c d e f g	a b c d e f g	a b c d e f g
<p>36. How much school did you miss due to this injury or accident?</p> <p>a. None b. 1 day or less c. 1 day to 1 week d. 8 days to 2 weeks e. 15 days to 1 month f. More than 1 month g. Unsure</p>	a b c d e f g	a b c d e f g	a b c d e f g	a b c d e f g
<p>37. How much work did you miss due to this injury or accident?</p> <p>a. None b. 1 day or less c. 1 day to 1 week d. 8 days to 2 weeks e. 15 days to 1 month f. More than 1 month g. Unsure</p>	a b c d e f g	a b c d e f g	a b c d e f g	a b c d e f g
<p>38. How much work did your parent or guardian miss due to this injury or accident?</p> <p>a. None b. 1 day or less c. 1 day to 1 week d. 8 days to 2 weeks e. 15 days to 1 month f. More than 1 month g. Unsure</p>	a b c d e f g	a b c d e f g	a b c d e f g	a b c d e f g



PERSONAL BEHAVIORS

39. During the past 12 months, how would you describe your grades in school?

- Mostly A's
- Mostly B's
- Mostly C's
- Mostly D's
- Mostly F's
- None of these grades
- Not sure

40. During June, July and August did you drive a motor vehicle such as a motorcycle, car or truck?

- Yes
- No

41. How often do you wear a seat belt when riding in or driving a car?

- Always
- Sometimes
- Rarely
- Never

42. Have you ever used chewing tobacco, snuff, or dip?

- Yes
- No

43. Do you currently smoke cigarettes?

- Yes
- No (SKIP TO question 44)



A. If yes, during the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?

- Less than one cigarette per day
- 1 cigarette per day
- 2 to 5 cigarettes per day
- 6 to 10 cigarettes per day
- 11 to 20 cigarettes per day
- More than 20 cigarettes per day

B. During June, July and August did you smoke cigarettes?

- Yes
- No

44. At home, do people smoke cigarettes around you?

- Often
- Sometimes
- Rarely
- Never

45. Do your friends smoke cigarettes around you?

- Often
- Sometimes
- Rarely
- Never

46. If you work, do people smoke at your place of work?

- Often
- Sometimes
- Rarely
- Never
- Don't work

47. During June, July and August, on how many days did you have at least One drink of alcohol? A drink is 1 can or bottle of beer, 1 glass of wine or wine cooler, 1 cocktail, or 1 shot.

- 0 days
- 1 or 2 days
- 3 to 5 days
- 6 to 9 days
- 10 to 19 days
- 20 to 29 days
- All days in the month

48. During June, July and August, on how many days did you have Five or more drinks of alcohol in a row, that is, within a couple of hours?

- 0 days
- 1 or 2 days
- 3 to 5 days
- 6 to 9 days
- 10 to 19 days
- 20 or more days

49. What is your height? (Please fill in the corresponding circles below.)

HEIGHT	
Feet	In.
3	0
4	1
5	2
6	3
7	4
	5
	6
	7
	8
	9
	10
	11

50. What is your weight? (Please fill in the corresponding circles below.)

WEIGHT IN POUNDS		
0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
	5	5
	6	6
	7	7
	8	8
	9	9

Appendix B

Midyear Recall Questionnaire
(Covering Events during Sept.-Dec.)

YOUTH AT WORK: INJURY SURVEY

MARKING INSTRUCTIONS

- Use a #2 pencil.
- Make heavy dark marks that fill the circle completely.
- Erase cleanly any answer you wish to change.
- Make no stray marks on this questionnaire.

CORRECT MARK



INCORRECT MARKS



DEMOGRAPHICS

1. Today's Date

Mo.		Day		Year	
0	0	0	0	0	0
1	1	1	1		1
	2	2	2		2
	3	3	3		3
	4		4		4
	5		5		
	6		6		
	7		7		
	8		8		
	9		9		

Your Birth Date

Mo.		Day		Year	
0	0	0	0		0
1	1	1	1		1
	2	2	2		2
	3	3	3		3
	4		4		4
	5		5		5
	6		6		6
	7		7		7
	8		8	8	8
	9		9	9	9

2. What gender are you?

- Male Female

3. What grade are you in?

- 9th 10th 11th 12th



DO NOT WRITE IN THIS SHADED AREA

WORK ACTIVITIES

Questions 4 - 12 refer to work you did during the Months of **September through December**. Work includes:

- > Paid or unpaid employment either at or away from your home.
- > Chores or work done for your family, such as lawn care, babysitting, dishes.
- > Chores or work done outside of your home.
- > Seasonal activities such as working harvest or lifeguarding.

4. Based on the definitions above, did you work during the months of September through December?

- Yes No (SKIP TO question 8)



Job Descriptions/Codes List

<p>Personal services</p> <p>01. lawn care 02. babysitting 03. maid/housekeeper 04. clean-up/janitorial worker 05. day care/child care worker 06. delivery person 07. car wash worker</p> <p>Restaurant/fast food</p> <p>08. car hop or fast food server 09. cook - fast food 10. waitress/waiter 11. buser 12. dishwasher 13. hostess/host</p>	<p>Retail</p> <p>14. cashier 15. stock clerk 16. sales clerk 17. station attendant 18. grocery bagger</p> <p>Professional/medical</p> <p>19. veterinarian's helper 20. teacher or teacher's aide 21. hospital orderly/nursing home assistant/personal care assistant 22. receptionist/office staff 23. computer operator/programmer</p> <p>Construction/manufacturing/food processing</p> <p>24. laborer 25. line worker</p>	<p>Entertainment/recreation</p> <p>26. amusement park attendant 27. lifeguard 28. recreation leader/camp counselor/sports instructor 29. dockhand 30. special events/activities (e.g., State Fair booth employee)</p> <p>Agricultural activities</p> <p>31. Work done on a farm under the supervision/employment of a farmer 32. Work done on a farm as a service to the farmer, but under the supervision of an agri-business provider 33. Other _____</p>
--	---	---

Please include information on all your work and chores below. We have provided space for **FOUR** types of work or chores.

5. What type of work or chores did you do during **September through December**? (enter 2-digit code from the list above)

JOB 1	JOB 2	JOB 3	JOB 4
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

6. What is the average number of hours you worked on a **TYPICAL WEEKDAY OR NIGHT** in **September through December**?

JOB 1	<input type="text"/>
JOB 2	<input type="text"/>
JOB 3	<input type="text"/>
JOB 4	<input type="text"/>

7. What is the average number of hours you worked on a **TYPICAL WEEKEND DAY OR NIGHT** in **September through December**?

JOB 1	<input type="text"/>
JOB 2	<input type="text"/>
JOB 3	<input type="text"/>
JOB 4	<input type="text"/>

INJURY/ACCIDENT EXPERIENCE

Please provide information on injuries or accidents that you have experienced. There are many different kinds of injuries: burns, broken bones, bruises, cuts, strains, sprains, or poisoning. This question asks about any injury or accident that:

- Restricted your normal activities for at least 4 hours;
AND/OR
- Resulted in a loss of consciousness, loss of awareness or amnesia for any length of time;
AND/OR
- Caused you to seek professional health care, including care by doctors, nurses, chiropractors, dentists, or other healthcare professionals.

8. According to the definition above, were you injured during September through December?

- Yes No (Survey is complete - Thank you)

9. Where did your injury or accident occur?

- | INJURY 1 | INJURY 2 | INJURY 3 | INJURY 4 |
|--|--|--|--|
| <input type="radio"/> ① Work |
| <input type="radio"/> ② School |
| <input type="radio"/> ③ Other activity |

INJURY 1 INJURY 2 INJURY 3 INJURY 4

10. In what month did your injury or accident occur?

- | | | | | |
|--------------|-----|-----|-----|-----|
| a. September | (a) | (a) | (a) | (a) |
| b. October | (b) | (b) | (b) | (b) |
| c. November | (c) | (c) | (c) | (c) |
| d. December | (d) | (d) | (d) | (d) |

11. Were you treated by any of the following as a result of this event? (Please mark all that apply.)

- | | | | | |
|---|-----|-----|-----|-----|
| a. Physician | (a) | (a) | (a) | (a) |
| b. Nurse/Nurse Practitioner/Physician's Assistant | (b) | (b) | (b) | (b) |
| c. Chiropractor | (c) | (c) | (c) | (c) |
| d. Dentist | (d) | (d) | (d) | (d) |
| e. Physical Therapist | (e) | (e) | (e) | (e) |
| f. No Professional Treatment | (f) | (f) | (f) | (f) |

12. As a result of this injury or accident, how long were your normal activities restricted? *Normal activities are things that you would expect to do on a regular basis.*

- | | | | | |
|---|-----|-----|-----|-----|
| a. Not restricted | (a) | (a) | (a) | (a) |
| b. 1 day or less | (b) | (b) | (b) | (b) |
| c. 1 day to 1 week | (c) | (c) | (c) | (c) |
| d. 8 days to 2 weeks | (d) | (d) | (d) | (d) |
| e. 15 days to 1 month | (e) | (e) | (e) | (e) |
| f. More than 1 month | (f) | (f) | (f) | (f) |
| g. Unsure/activities are still restricted | (g) | (g) | (g) | (g) |

Survey is complete - Thank you

Appendix C

Youth at Work Recruitment Materials:

- (1) Fact Sheet with Logo
- (2) Curriculum Brochure
- (3) Letter from Health Commissioner
- (4) Letter from Study Directors



Youth at Work

A Partnership for Adolescent Work Safety

About our Partnership

The *Youth at Work* partnership is comprised of teachers, school administrators, parents, public health personnel and people concerned with adolescent work safety. Initial studies at the Minnesota Department of Health (MDH) show that Minnesota youth residing in Greater Minnesota are working long hours both in farm and non-farm work. When compared to adults, adolescents are injured at nearly twice the rate of adults.

Through a scientific research grant from the National Institute for Occupational Health and Safety (NIOSH), the *Youth at Work* partnership received funding to further investigate the issues of adolescent work safety in Greater Minnesota. The NIOSH study also provides the MDH with the opportunity to further evaluate the impact of the *Work Safe Work Smart* curriculum. *Work Safe Work Smart* was designed in conjunction with Minnesota high school teachers to try to reduce the number of workplace injuries and fatalities among our young adults.

By joining the *Youth at Work* study partnership your school is providing national health leadership in protecting one of our most valuable resources, our young people. We encourage you to read on and discover what *Youth at Work* can do for the students in your school.

Youth at Work Grant Activities

Youth at Work is a partnership with educators and other interested individuals across the state whose goal is to better understand the work habits of our youth living in Greater Minnesota and to try to reduce unintentional injury among our adolescents.

Our goal is to accomplish this by working with schools to:

- learn how many students work, what kinds of jobs they are doing and what types of injuries they have had;
- work with educators to teach a curriculum designed to reduce injury (*Work Safe Work Smart*); and
- evaluate the impact of the *Work Safe Work Smart* curriculum in reducing work injury in young adults.

What Partnership Schools Provide

- Professional staff to teach a curriculum designed to reduce students' risk of work-related injury in their current and future work life.
- Student input toward understanding both work patterns and injury incidence among young adults.

What We Will Offer Participating Schools

- School specific reports on work and injury information we have learned from your students.
- A teacher-developed and teacher-tested curriculum, *Work Safe Work Smart*, that focuses on reducing the number of working youth that are injured or die each year.
- Financial reimbursement for activities associated with *Youth at Work*.

What Your School Will Be Asked To Do

- Schedule several brief meetings and agree to complete specific study activities. Study tasks can be delegated to a teacher or administrative liaison.
- Students complete surveys throughout the course of two school years. Each survey will be completed within one class period.
- Schools will be asked to either teach the *Work Safe Work Smart* curriculum or serve as a control school. Students in control schools will complete surveys as mentioned above.

For More Information Contact:

*Debora Boyle or Teresa Hillmer
Minnesota Department of Health
717 Delaware Street S.E. P.O. Box 9441
Minneapolis, MN 55440-9441
Phone 612-676-5216 Toll Free 1-888-642-8498*

Why is workplace safety important?

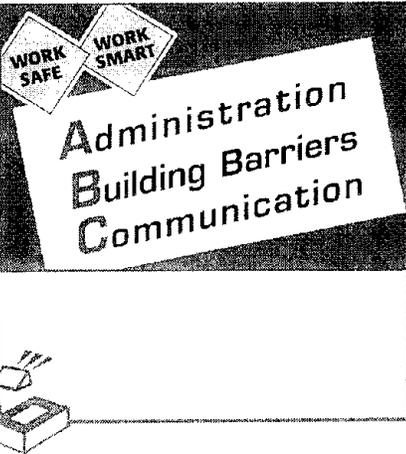
Work is a big part of most teenagers' lives. By the 12th grade, at least 80% of Minnesota teens have held at least one job.

Work can also be dangerous. Every week in Minnesota, on average, one to two people die at work, eight to ten lose a finger, and 10 to 20 develop work related cancer, and 3,000 sustain other injuries.

Work Safe Work Smart is an interactive curriculum designed to help keep teens safe at work. Along with Minnesota teachers, experts in the field of Occupational Health & Safety developed a curriculum to help reduce workplace injuries among teenagers and keep our kids safe.

Who is Work Safe Work Smart for?

This curriculum is designed for students in grades 9-12. Work Safe Work Smart equips students with: prevention strategies that will protect them from injuries or illnesses in a variety of workplace settings, knowledge of workplace laws, and the skills needed to advocate for a safe workplace in any setting.



FACT: Virtually all Americans have held regular jobs by the time they reach 20 years of age.

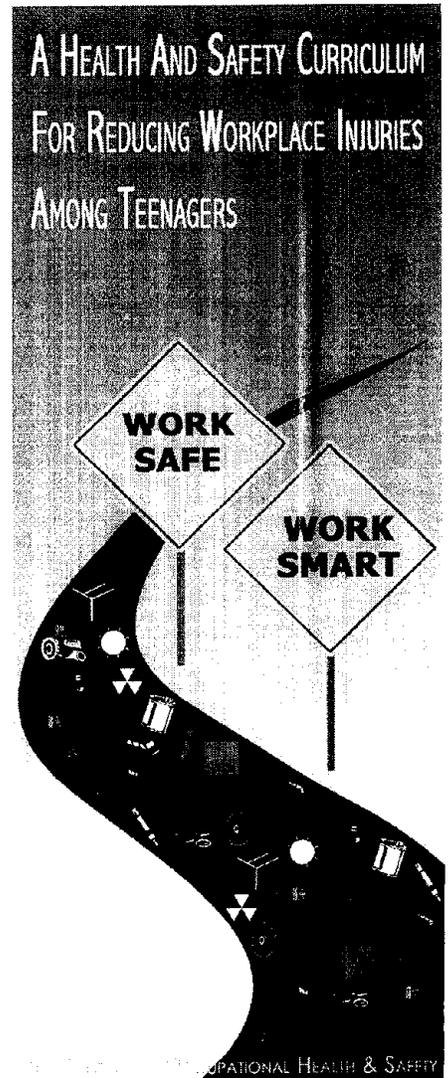
FACT: Virtually all Americans have held regular jobs by the time they reach 20 years of age. Injuries are common; almost 10% of working teenagers are injured at work each year.

FACT: In a New York state study, agriculture, which employs only 3% of working adolescents, was the second most dangerous occupation for teens, accounting for the highest number of injuries among 16- and 17-year-old workers. Farming consistently has been identified as Minnesota's most hazardous occupation.

FACT: Of those 14- to 16- year olds who were injured in the workplace, more than half reported they had not received any training on how to prevent the injury. A supervisor was present at the time of the injury in only about 20% of the cases.

FACT: Passage of the Fair Labor Standards Act of 1938 placed, for the first time in U.S. history, federal limitations on the types of nonagricultural work permitted for children and adolescents under the age of 18.

FACT: Most injuries are preventable and, with the right prevention steps, can be avoided.



Facts about the Curriculum

National studies indicate that working youth are getting hurt at nearly twice the rate of working adults. The Work Safe Work Smart curriculum was developed in response to this disturbing rate of illness and injury.

Goals of the Curriculum

- ♦ Raise student awareness of workplace hazards that cause injuries or illness
- ♦ Equip students with prevention strategies that will protect them from injuries or illness in a variety of workplace settings
- ♦ Raise student awareness of employer/ee rights in the workplace
- ♦ Raise student awareness of the laws and resources available to help maintain those rights
- ♦ Encourage students to be active participants in creating safe and healthy work environments.

Work Safe Work Smart will help your students

- ♦ Recognize workplace hazards
- ♦ Know their rights in the workplace
- ♦ Develop skills to create safe and healthy work environments.

Target Audience

The lessons in this curriculum target students in grades 9-12. With some adaptation, these lessons could also be used with a younger audience.



Key Components of the Curriculum

Lessons were designed and developed to integrate existing social studies, health, agriculture, career and school-to-work subject areas. The curriculum was developed with Minnesota teachers and tested in Minnesota classrooms.

Length of the Curriculum

This curriculum consists of nine, 50-minute lessons to guide teachers in exploring occupational health and safety issues. The timing of lessons can be modified to complement and enhance existing subject areas.

Funding

Work Safe Work Smart was made possible through a grant from the National Institute for Occupational Safety and Health (NIOSH). The curriculum was designed by staff from the Minnesota Department of Health and teachers in Minnesota schools.

Pathways of Exposure

Physical Hazards

Energy is transferred to a worker in a variety of ways:



Heat (burns)

Falling objects



Falling from heights



Each Lesson of Work Safe Work Smart Provides You With:

Teacher Tips:
Tips from teachers who tested the curriculum in Minnesota Classrooms.

Facts:
Interesting facts that help put a particular lesson into perspective.

Descriptions:
Brief description of lesson activities.

Learner Outcomes:
Intended cognitive, attitudinal, and behavioral outcomes for the lesson.

Key Concepts:
Summarize key concepts of the lesson.

Directions:
Step-by-step instructions for completing the lesson, including a lesson script in bold type.

Taking it Home:
Homework assignments to be completed in preparation for the next class lesson.

Resources:
Overheads, handouts, and supplies to be used in the lesson.

To Receive a Copy:

For a FREE copy of the Work Safe Work Smart curriculum, contact Deb Hill at 612- 676-5213, 1-888-642-8498, or Deborah.hill@health.state.mn.us. The curriculum can also be downloaded from the Center of Occupational Health website at www.health.state.mn.us/divs/hpcd/cdee/occhealth/.





Protecting, maintaining and improving the health of all Minnesotans

Date, 2001

Principal
High School
Street
City, MN Zip

Dear Principal _____

I am writing to request your participation in the *Youth at Work* research study. We are excited to report that the Minnesota Department of Health recently received funding from the National Institute for Occupational Safety and Health (NIOSH) to collect information on injury to high school students and evaluate the impact of the Work Safe Work Smart curriculum on these students. The Work Safe Work Smart curriculum was developed in collaboration with Minnesota teachers and state public health personnel.

This project is a statewide expansion of efforts that were initially pilot tested in Meeker, McLeod and Sibley county high schools. Because working adolescents are at higher risk for unintentional injury and death, we believe the implementation of this project is an important component to protecting the health of our young adults.

In the near future a staff member from the Minnesota Department of Health will be contacting you to arrange a convenient time to meet. Minnesota has an opportunity to lead the nation in understanding the number of injuries and death among our working adolescents. It is our hope that you will join our efforts to help keep our rural youth working safe, thus assuring them the opportunity to lead a productive and fulfilling life.

Sincerely,

Jan K. Malcolm
Commissioner
P.O. Box 64882
St. Paul, MN 55164-08882

cc: Superintendent _____

General Information: (651) 215-5800 • TDD/TTY: (651) 215-8980 • Minnesota Relay Service: (800) 627-3529

<http://www.health.state.mn.us>

An equal opportunity employer



Protecting, maintaining and improving the health of all Minnesotans

February 26, 2001

Principal
Senior High School
Street
City, Minnesota Zip

Dear:

Your school is one of only 41 high schools in Minnesota that have been selected to participate in the *Youth at Work* research study. The Minnesota Department of Health recently received federal funding to improve our understanding of the amount and type of work our adolescents in Greater Minnesota are doing and to reduce the number of injuries at work by implementing an educational intervention. We are writing to request your help with this very important statewide study.

You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. In the United States injuries at work cause approximately 70 adolescents to die each year and over 10,000 to seek emergency room treatment. Through *Youth at Work* we are collecting statewide information on work and injury to adolescents, evaluating the impact of a work safety curriculum in reducing work injury and analyzing the results of the data. Your school will be provided reports describing the impact of work and injury on your students.

We would like the opportunity to meet with you and school staff to describe the *Youth at Work* research study in more detail. In the near future we will be contacting you to answer any questions you may have about the study and set-up a convenient time to meet. If you have any questions, please contact us at 612-676-5216 or 1-888-642-8498.

Sincerely,

Debora Boyle, D.V.M., Ph.D.
Director, Youth at Work

Teresa Hillmer, M.P.H., Ph.D.
Director, Youth at Work

cc:

Appendix D

Notification Letters to Parents



Protecting, maintaining and improving the health of all Minnesotans

August 27, 2001

Dear Parent/Guardian:

The *Youth at Work* partnership through the Minnesota Department of Health is comprised of teachers, school administrators, parents, and public health personnel concerned with adolescent work safety. You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. The purpose of this letter is to give you an overview of *Youth at Work* and contact information should you have any questions.

Through *Youth at Work* we are collecting statewide information on work and injury to adolescents, evaluating the impact of a work safety curriculum in reducing work injury, and analyzing the results of the data. The school that your child attends is one of the high schools selected to participate in this study. Students will be asked to complete short surveys in the Fall and the Spring about their work habits and any injuries that may occur to them. The surveys take between 15 and 30 minutes to complete. All information obtained in these surveys will be confidential, and the identity of participants will not be released to others nor will identifiable information be included in any reports. Some schools also will be asked to teach a few classes in selected courses to address workplace injury. We know of no risks to your child that may result from the *Youth at Work* activities, and benefits include an increased knowledge and awareness of occupational health and safety.

Your child does not have to participate if either you or your child do not want to, and participating, or not participating, in the *Youth at Work* activities will not affect you, your child, or your relationships with the participating school in any way. If you have any questions about these activities, please contact Cynthia Hickman or Deborah Merchant at the Minnesota Department of Health at (888) 642-8498. If we do not hear from you by September 14, 2001, we will assume that we have your consent to allow your child to participate in the *Youth at Work* activities as listed above.

Sincerely,

Debora Boyle, D.V.M., Ph.D.
Director, Youth at Work

Teresa Hillmer, M.P.H., Ph.D.
Director, Youth at Work



Protecting, maintaining and improving the health of all Minnesotans

September 18, 2001

Dear Parent/Guardian:

The *Youth at Work* partnership through the Minnesota Department of Health is comprised of teachers, school administrators, parents, and public health personnel concerned with adolescent work safety. You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. The purpose of this letter is to give you an overview of *Youth at Work* and contact information should you have any questions.

Through *Youth at Work* we are collecting statewide information on work and injury to adolescents, evaluating the impact of a work safety curriculum in reducing work injury, and analyzing the results of the data. The school that your child attends is one of the high schools selected to participate in this study. Students will be asked to complete short surveys in the Fall and the Spring about their work habits and any injuries that may occur to them. The surveys take between 15 and 30 minutes to complete. All information obtained in these surveys will be confidential, and the identity of participants will not be released to others nor will identifiable information be included in any reports. Some schools also will be asked to teach a few classes in selected courses to address workplace injury. We know of no risks to your child that may result from the *Youth at Work* activities, and benefits include an increased knowledge and awareness of occupational health and safety.

Your child does not have to participate. If your child does or does not participate in the *Youth at Work* activities it will not affect you, your child, or your relationships with the participating school in any way. If you have any questions about these activities, please contact Cynthia Hickman or Deborah Merchant at the Minnesota Department of Health at (888) 642-8498. If we do not hear from you by October 10, 2001, we will assume that we have your consent to allow your child to participate in the *Youth at Work* activities as listed above.

Sincerely,

Deborah Merchant, M.S.
Project Director Youth at Work

Cynthia D. Hickman, M.P.H.
Project Director Youth at Work

General Information: (651) 215-5800 • TDD/TTY: (651) 215-8980 • Minnesota Relay Service: (800) 627-3529

<http://www.health.state.mn.us>

An equal opportunity employer

Appendix E

OHRP Instructions to Schools



Protecting, maintaining and improving the health of all Minnesotans

DATE

NAME

SCHOOL

ADDRESS

CITY, STATE ZIP

DEAR NAME:

Thank you for agreeing to participate in the Minnesota Department of Health (MDH) Youth at Work project. Because Youth at Work is considered a human subject research project and is funded through the Centers for Disease Control and Prevention (CDC), there are two requirements that must be completed prior to SCHOOL NAME'S participation.

The first requirement is an online training from the Office of Human Research Protection (OHRP) called the Human Subject Assurance Training. This training can be located at:

http://137.187.172.201/cbttng_ohrp/default.asp?CBTID=2

The training site consists of three modules providing information required by OHRP. Each module should be completed by the designated Youth at Work Signatory Official of SCHOOL NAME. The modules are not lengthy, and step by step log on instructions enable the Signatory Official to complete the required OHRP Human Subject Assurance Training. A printable certificate verifies completion of training.

The second requirement is the enclosed and comes from the U.S. Department of Health and Human Services (DHHS). This document is known as the Federalwide Assurance of Protection for Human Subjects (FWA). The FWA identifies responsible parties related to human subject research. Areas shaded in gray refer to International Institutions and are not pertinent to SCHOOL NAME's participation.

Also enclosed for your information is a copy of the Belmont Report. This document is referenced in the FWA and outlines ethical principles for all participants in the Youth at Work project.

To assure uninterrupted project participation:

- Log on to the OHRP Assurance Training web site
http://137.187.172.201/cbttng_ohrp/default.asp?CBTID=2
- **Complete all three** Human Subject Protection Training modules
- **SIGN** your FWA
- **Return your completed FWA** to me at MDH within 10 business days of receipt of this letter.

If you have any concerns, questions or comments regarding either document please do not hesitate to contact me by phone at (888) 642-8498 or by email at cynthia.hickman@health.state.mn.us or the address listed below.

Looking forward to working with you on this project.

Sincerely,

Cynthia D. Hickman, M.P.H.
State Program Administrative Coordinator
Youth at Work

Enclosures

Appendix F

Instructions to Teachers for Administering
Surveys

Youth at Work Injury Survey Instructions

Spring 2002

(For Teachers or Survey Administrators)

- Distribute the survey to the student whose name appears on the front page. It is very important that the student fill out the survey with the sequence number that was assigned to him/her during Fall 2001 implementation.
- Read “Introduction to the *Youth at Work* Injury Survey” to students.
- After survey is completed, have students remove the front sheet from the survey along perforated lines.
- Collect completed surveys from students.
- Collect separated front sheets from students.
- Return completed surveys and separated front sheets to your school *Youth at Work* Liaison, «liaison».
- Give list of any student who did NOT COMPLETE the survey to «liaison». For each of these students, please include the reason he/she did not complete the survey.

If you have any questions or concerns about the administration of this survey, please contact «liaison» or Deborah Merchant at (612) 676-5118.

Appendix G

Instructions Read to Students for Completing
Surveys

Introduction to the Youth at Work Injury Survey Spring 2002

(To be read to students by teacher or survey administrator)

You may know firsthand that working adolescents are at greater risk for both permanent and temporary injury than adult workers. In the United States injuries at work cause approximately 70 adolescents to die each year and over 10,000 to seek emergency room treatment.

The Minnesota Department of Health and «School» are interested in finding out about the work habits and injury occurrence of young adults in Greater Minnesota. Through the Youth at Work Injury Survey we are collecting statewide information on work and injury to adolescents.

There are no right or wrong answers in this survey, but please think about these questions carefully and answer them as accurately as possible based on your experience September 2001. There may be sections that you will be able to skip entirely; however, within sections that apply to your work or injury experience, please answer each question fully. When changing an answer, completely erase the incorrect circle. Make no unnecessary marks on this survey.

When filling out this survey, there are two definitions we would like you to know.

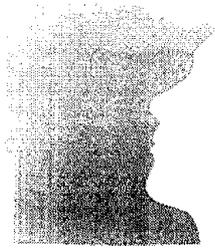
- **For the purposes of this survey, the term work means that you participated in:**
 - Paid or unpaid employment either at or away from your home.
 - Chores or work done for your family, such as lawn care, babysitting, dishes.
 - Chores or work done outside of your home.
 - Seasonal activities such as working harvest or lifeguarding.

- **Another definition in this survey is about injury. In this survey, an injury or an accident is an event that:**
 - Restricted your normal activities for at least 4 hours;
AND/OR
 - Resulted in a loss of consciousness, loss of awareness, or amnesia for any length of time;
AND/OR
 - Caused you to seek professional health care, including care by doctors, nurses, chiropractors, dentists, or other healthcare professionals.

Please read all the directions carefully.

Appendix H

Sample Report Sent to Schools March 2003



Youth at Work Progress Report

Youth at Work

Partnership of Teachers, Administrators, and Public Health Officials

March 2003

Minnesota Department of Health

Youth at Work

Youth at Work is a partnership comprised of teachers, administrators, public health personnel and other individuals concerned with adolescent work safety. Forty-one schools throughout Greater Minnesota are participating in Youth at Work. This project was developed by the Minnesota Department of Health with funding from the National Institute for Occupational Safety and Health (a part of the Centers for Disease Control and Prevention). This project is the only one of its kind in the nation.

Youth at Work includes two school-centered projects: an Injury Survey and evaluation of the *Work Safe Work Smart* curriculum. The Injury Survey, which is comprised of a series of self-reported surveys, will determine how many students work, what kinds of jobs they have, and what types of injuries they have experienced.

The *Work Safe Work Smart* curriculum was designed to teach students hazard recognition, injury prevention strategies, communication skills, and Child Labor laws. The curriculum is being evaluated through a series of questionnaires to determine its impact in reducing work injury in youth.

Injury Survey

The goal of the Injury Survey is to determine the magnitude and scope of work, injuries and asthma among 9-12 grade students in Greater Minnesota.

All 41 schools recruited for Youth at Work conducted the Injury Survey. During the 2001-2002 school year, almost 14,000 students in grades 9-11 completed two surveys (fall and spring) asking about work activities, asthma, injury occurrence, and risk factors related to injuries. Over 90% of surveys were returned! The same students, now in grades 10-12, were surveyed in the Fall of 2002 and will take one final survey in the Spring of 2003.

Inside this progress report you will find information specific to your school about how many hours students are working and whether they have been injured. The information is compared to the 40 other schools that participated in the study. This preliminary information is from the Fall 2001 and Spring 2002 surveys. You will receive further information and analysis in the Spring of 2004.

[High School Name]

Work

Percent of students who reported working:

	Summer	School Year
Girls	81%	60%
Boys	73%	51%
Grade 9	66%	42%
Grade 10	70%	51%
Grade 11	88%	68%
Grade 12	88%	74%

Average number of hours worked on typical weekday or weeknight:

	Summer	School Year
Grade 9	5.88	2.56
Grade 10	7.29	3.46
Grade 11	9.80	4.92
Grade 12	10.76	6.15

Average number of hours worked on a typical weekend day or night:

	Summer	School Year
Grade 9	4.95	3.48
Grade 10	5.71	4.43
Grade 11	8.99	7.11
Grade 12	9.19	6.93

Injury

Percent of students reporting an injury:

	Summer	School Year
Girls	12%	10%
Boys	13%	12%
Grade 9	15%	13%
Grade 10	13%	12%
Grade 11	12%	8%
Grade 12	8%	9%

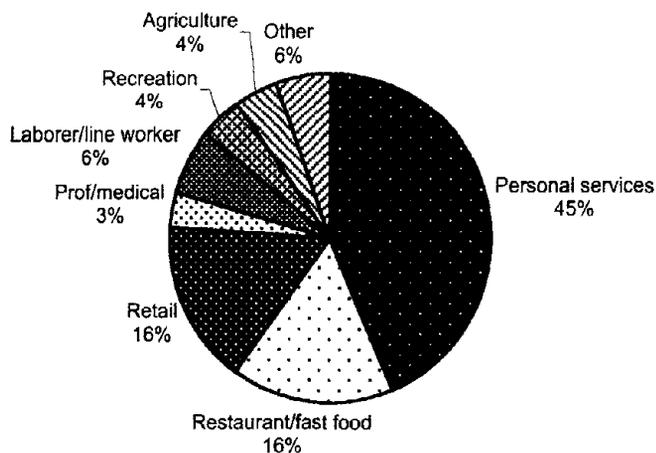
For those who were injured, the amount of school missed due to the injury:

	School Year
None	62%
≤ 1 day	14%
≥ 2 days to < 15	10%
> 15 days	2%

Where reported injury or accident occurred:

	Summer	School Year
Work/chores	17%	12%
School	1%	16%
Other	82%	71%

Jobs held by students 2001-2002



Definition of **WORK** used in this survey

- Paid or unpaid employment either at or away from home.
- Chores or work done for family, such as lawn care, babysitting, or dishes.
- Chores or work done outside of the home.
- Seasonal activities such as working harvest or lifeguarding.

All Schools

Work

Percent of students who reported working:

	Summer	School Year
Girls	80%	66%
Boys	74%	53%
Grade 9	71%	51%
Grade 10	73%	58%
Grade 11	86%	70%

Average number of hours worked on a typical weekday or weeknight:

	Summer	School Year
Grade 9	6.8	3.2
Grade 10	7.5	4.0
Grade 11	9.9	5.5

Average number of hours worked on a typical weekend day or night:

	Summer	School Year
Grade 9	5.7	4.3
Grade 10	6.4	5.5
Grade 11	8.8	7.7

Injury

Percent of students reporting an injury:

	Summer	School Year
Girls	10%	10%
Boys	12%	11%
Grade 9	12%	12%
Grade 10	10%	10%
Grade 11	11%	9%

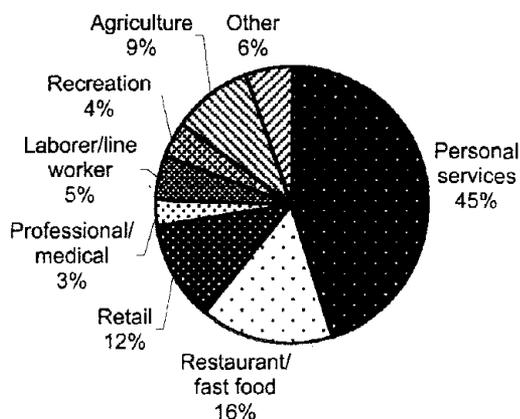
For those who were injured, the amount of school missed due to the injury:

	School Year
None	67%
≤ 1 day	15%
≥ 2 days to < 15	15%
> 15 days	3%

Where reported injury or accident occurred:

	Summer	School Year
Work/chores	22%	14%
School	7%	25%
Other	71%	61%

Jobs held by students 2001-2002



Definition of INJURY used in this survey

Any injury or accident that:

- Restricted normal activities for at least 4 hours; and/or
- Resulted in loss of consciousness, loss of awareness or amnesia for any length of time; and/or
- Caused the student to seek professional health care, including care by doctors, nurses, chiropractors, dentists, or other healthcare professionals.

Work Safe Work Smart Curriculum

The *Work Safe Work Smart* curriculum was designed by MN teachers and administrators, experts from the field of occupational health and safety, and other individuals concerned about worker safety. The goals of this curriculum are to:

- Raise student awareness of workplace hazards that cause injuries or illness
- Equip students with prevention strategies that will protect them from injuries or illness in a variety of workplace settings
- Raise student awareness of their rights in the workplace
- Raise student awareness of the laws and resources available to help maintain those rights
- Encourage students to be active participants in creating safe and healthy work environments.

Eighteen Youth at Work schools were randomly chosen for staff training and curriculum implementation. An additional 18 schools were matched by region, school size, and grade as “control” schools. Students in control schools were given the questionnaires but were not taught the curriculum. Over 4,000 students throughout Greater MN completed questionnaires to evaluate changes in student work health/safety knowledge, attitudes, and beliefs. Results of the curriculum evaluation will be available in the fall of 2003.

For a **FREE COPY** of the *Work Safe Work Smart* curriculum, please contact Deb Hill at 612-676-5213, 1-888-642-8498, or deborah.hill@health.state.mn.us.

Acknowledgements

Thank you to all the administrators, staff, and students who have made this project a success.

Albert Lea	Milaca Secondary
Bemidji Senior	Montevideo Senior
Brainerd Senior	Morris Area Secondary
Buffalo Lake-Hector	Murray County Central Secondary
C-G-B Secondary	Nevis Secondary
Cook County Secondary	New London Spicer
Dawson-Boyd Secondary	Nicollet Secondary
Fergus Falls Senior	Norman County West
Fulda Secondary	Northland Secondary
Glenville-Emmons Senior	Owatonna Senior
Greenway Senior	Parkers Prairie Secondary
Hayfield Secondary	Pelican Rapids Secondary
Henning Secondary	Pine Island Secondary
Hinckley-Finlayson Secondary	Red Rock Central Secondary
Jefferson Senior	Sebeka Secondary
Kingsland Senior	St. Peter Senior
Lafayette High	Tracy Secondary
Lesueur-Henderson Secondary	Tri-County Secondary
Lincoln Secondary	Underwood Secondary
Luverne Senior	United South Central
Marshall County Central	



For more information about the Youth at Work project, call 1-888-642-8498 or send an e-mail to workerhealth@health.state.mn.us.

Appendix I

Sample Report Sent to Schools October 2003



Youth at Work Progress Report

Youth at Work

A Partnership for Adolescent Work Safety

October 2003
Minnesota Department of Health

The Youth at Work team wants to thank you for your participation in last year's activities. We hope that the school year is going well. Last March we sent you a progress report on the Youth at Work Projects. We now have data from the 2002-2003 school year for the Injury Survey.

As you know, the goal of the Injury Survey is to determine the magnitude and scope of work, injuries and asthma among 9-12 grade students in Greater Minnesota. Last year's report included information about students in grades 9-11. This report includes information from the same students, now in grades 10-12.

During the 2002-2003 school year, the number of surveys returned from 10-12 grade students decreased from the previous year. Nine thousand students in the fall and 7,800 students in the spring completed the surveys asking about work activities, asthma, injury occurrence, and risk factors related to injuries.

Employment rates statewide and nationwide have decreased. We saw this same trend with students in your school; fewer of them are working. Typically, as students get older there is an increase in employment. This survey showed that in all demographics (boys, girls, and all grades), fewer students held jobs.

The types of jobs students held in 2002-2003 remained about the same as 2001-2002. However, there was a decrease in the percent of students working in all areas, except for personal service jobs, which showed an increase. For those students that are working, they are basically working the same number of hours on week days and week ends as in the 2001-2002 survey.

Inside this progress report you will find specific information for your school from the 2002-2003 surveys about how many hours students are working and whether they have been injured. This information is compared to the other 37 schools that participated in the study during the 2002-2003 school year.

Further information and analysis will be available in the Spring of 2004. If you have any questions, please contact Debby Langner at 612-676-5118, 1-888-642-8498 or debby.langner@health.state.mn.us.

Your participation in this effort was very much appreciated. Please extend our thanks to the staff and students at your school.

[High School Name]

Work

Percent of students who reported working:

	Summer	School Year
Girls	81%	71%
Boys	65%	46%
Grade 10	53%	34%
Grade 11	77%	68%
Grade 12	87%	72%

Average number of hours worked on a typical weekday or weeknight:

	Summer	School Year
Grade 10	6.3	4.5
Grade 11	9.5	5.7
Grade 12	9.8	6.0

Average number of hours worked on a typical weekend day or night:

	Summer	School Year
Grade 10	6.0	5.8
Grade 11	9.5	7.8
Grade 12	9.2	8.2

Injury

Percent of students reporting an injury:

	Summer	School Year
Girls	7%	8%
Boys	7%	10%
Grade 10	3%	7%
Grade 11	10%	12%
Grade 12	6%	8%

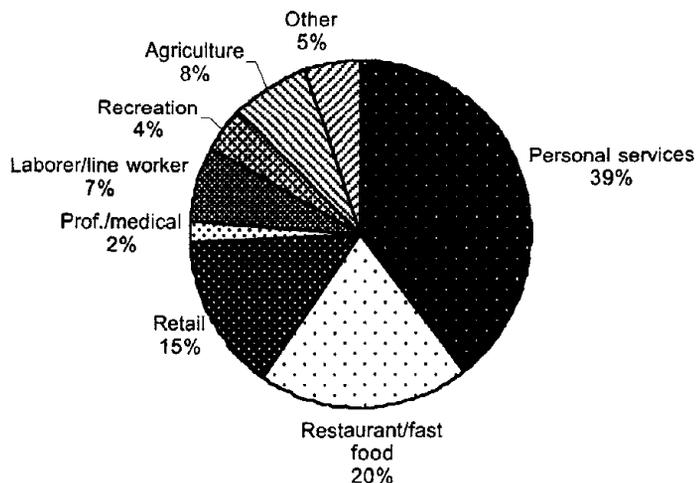
For those who were injured, the amount of school missed due to the injury:

	School Year
None	62%
≤ 1 day	14%
≥ 2 days to < 15	19%
≥ 15 days	5%

Where reported injury or accident occurred:

	Summer	School Year
Work/chores	45%	33%
School	14%	42%
Other	41%	25%

Jobs held by students 2002-2003



Definition of WORK used in this survey

- Paid or unpaid employment either at or away from home.
- Chores or work done for family, such as lawn care, babysitting, or dishes.
- Chores or work done outside of the home.
- Seasonal activities such as working harvest or lifeguarding.

All Schools

Work

Percent of students who reported working:

	Summer	School Year
Girls	73%	61%
Boys	63%	44%
Grade 10	59%	44%
Grade 11	69%	56%
Grade 12	78%	58%

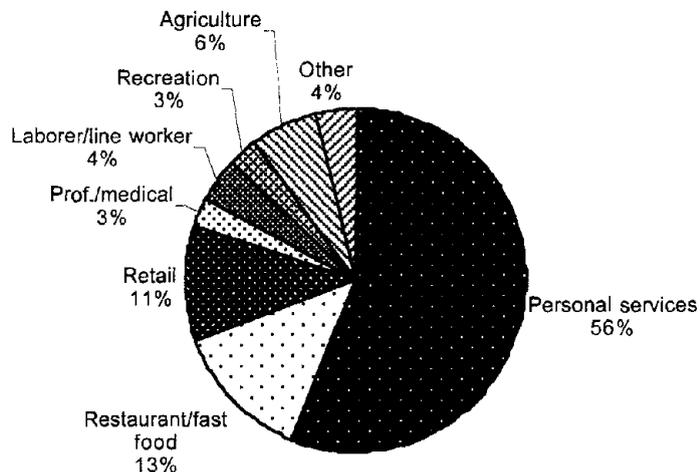
Average number of hours worked on a typical weekday or weeknight:

	Summer	School Year
Grade 10	5.8	3.1
Grade 11	7.3	3.9
Grade 12	8.9	4.2

Average number of hours worked on a typical weekend day or night:

	Summer	School Year
Grade 10	5.1	4.4
Grade 11	6.5	5.5
Grade 12	7.8	5.8

Jobs held by students 2002-2003



Injury

Percent of students reporting an injury:

	Summer	School Year
Girls	5%	6%
Boys	6%	6%
Grade 10	6%	6%
Grade 11	4%	6%
Grade 12	6%	5%

For those who were injured, the amount of school missed due to the injury:

	School Year
None	58%
≤ 1 day	18%
≥ 2 days to < 15	20%
≥ 15 days	5%

Where reported injury or accident occurred:

	Summer	School Year
Work/chores	33%	16%
School	6%	30%
Other	61%	53%

Definition of **INJURY** used in this survey

Any injury or accident that:

- Restricted normal activities for at least 4 hours; and/or
- Resulted in loss of consciousness, loss of awareness or amnesia for any length of time; and/or
- Caused the student to seek professional health care, including care by doctors, nurses, chiropractors, dentists, or other healthcare professionals.

Are you a *Work Safe Work Smart* School?

Work is a big part of most teenagers' lives. By the 12th grade, over 80% of Minnesota teens have held at least one job.

Work can also be dangerous. Every week in Minnesota, on average, one to two people die at work, eight to ten people lose fingers, 10 to 20 develop work-related cancers, and 3,000 sustain other kinds of injuries. Students are injured at twice the rate of adults when the number of hours worked is compared.

The *Work Safe Work Smart* curriculum can help equip your students with: prevention strategies that will protect them from injuries or illnesses in a variety of workplace settings; knowledge of workplace laws; and the skills needed to advocate for a safe workplace in any setting.

The curriculum consists of nine, 50-minute lessons. The lessons can be integrated into existing coursework in social studies, health, agriculture, career exploration, and school-to-work. Lessons 1 through 5 explore the health-related issues of workplace hazards and their prevention. Lessons 6 through 9 explore the legal rights and communication skills related to addressing workplace safety issues.

For a **FREE CD** of the *Work Safe Work Smart* curriculum, please contact Deb Hill at 612-676-5213, 1-888-642-8498, or deborah.hill@health.state.mn.us. The curriculum can also be downloaded from the MDH Center for Occupational Health website at: <http://www.health.state.mn.us/divs/hpcd/cdee/occhealth/index.html>

Acknowledgements

Thank you to all the administrators, staff, and students who have made this project a success.

Albert Lea	Milaca Secondary
Bemidji Senior	Montevideo Senior
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Dawson-Boyd Secondary	Nicollet Secondary
Fergus Falls Senior	Norman County West
Fulda Secondary	Northland Secondary
Glenville-Emmons Senior	Owatonna Senior
Greenway Senior	Parkers Prairie Secondary
Hayfield Secondary	Pelican Rapids Secondary
Henning Secondary	Pine Island Secondary
Hinckley-Finlayson Secondary	Red Rock Central Secondary
Jefferson Senior	Sebeka Secondary
Kingsland Senior	St. Peter Senior
Lafayette High	Tracy Secondary
Lesueur-Henderson Secondary	Tri-County Secondary
Lincoln Secondary	Underwood Secondary
Luverne Senior	United South Central
Marshall County Central	



For more information about the Youth at Work project, call 1-888-642-8498 or send an e-mail to workerhealth@health.state.mn.us.

Appendix J

Published Paper:
Asthma Among Rural Minnesota Adolescents

Brunner WM, Lindgren PG, Langner DM, Williams AN, Yawn BP [2005]. Asthma among rural Minnesota adolescents J Asthma 2005 Nov; 42(9):787-792.
<http://dx.doi.org/10.1080/02770900500308460>