

FINAL PROGRESS REPORT

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LIST OF ABBREVIATIONS

CFOI: Census of Fatal Occupational Injuries

CPS: Current Population Survey

EDC: Education Development Center

ED SCIP: Emergency Department Surveillance and Coordinated Injury Prevention System

FACE: Fatality Assessment and Control Evaluation

IWGYE: Interagency Working Group on Youth Employment

MDPH: Massachusetts Department of Public Health

MYWI: Massachusetts Young Worker Initiative

NAICS: North American Industrial Classification System

NIOSH: National Institute for Occupational Safety and Health

OHSP: Occupational Health Surveillance Program

OSHA: Occupational Safety and Health Administration

SIC: Standard Industrial Classification

TAW: Teens At Work Injury Surveillance and Prevention Project

US DOL: United States Department of Labor

ABSTRACT

Each year in the United States an estimated 230,000 youths are injured on the job and close to 70 are killed. Teens have been recognized as a priority worker population with special concerns and unique opportunities for intervention through schools and communities as well as the workplace. Surveillance of work-related injuries to youths is essential to guide educational and regulatory interventions as well as the development of new control technologies. State surveillance data are needed to inform state prevention priorities, and states are in an optimal position to actively link surveillance findings with intervention efforts at the worksite and in the community. State-based surveillance that includes follow-up activities can also fill significant gaps in surveillance of occupational injuries to teens at the national level.

In 1993, work-related injuries to individuals less than 18 years of age became reportable in Massachusetts. Since that time, with support from NIOSH, the Massachusetts Department of Public Health's (MDPH) Occupational Health Surveillance Program (OHSP) has worked to establish a model statewide surveillance and intervention system for occupational injuries to youths. The surveillance system is designed both to identify sentinel cases for case specific follow-up and to generate representative summary data that can be used to inform broad-based prevention activities. This Cooperative Agreement enabled OHSP to continue and enhance surveillance and related intervention activities during 2000-2004. Multiple data sources predominantly workers' compensation records and emergency department reports were used to identify over 1,700 teen occupational injury cases, follow-up interviews with 173 injured teens were completed, and surveillance findings were used to target worksite interventions and a promote a range of broad-based prevention activities.

Between 1993 and 2003 there were 5,530 teen injury cases reported to OHSP. Fifty-six percent of these injuries occurred in four industries: restaurants (32%), grocery stores (14%), nursing homes (6%), and department stores (5%). The highest rates (based on injuries to 16 and 17 year-olds for which workers' compensation claims were filed) were observed among teens employed in the transportation and warehousing industry. The nature of injury varied by data source. The most frequent injuries captured by workers' compensation were strains and sprains of which half involved the back. Cuts and lacerations predominated among injuries identified through emergency department records reported by a convenience sample of 9 hospitals actively participating in the surveillance system. Ten teens died as a result of work-related injuries during the 10-year surveillance period. Information from interviews with injured teens, while not necessarily representative, underscored critical problems to be addressed. Almost half (47%) of 758 injured teens interviewed since 1993 reported they had received no health and safety training from their employers; only 61% had employment permits, and 14% were working with no supervisors on site at the time of injury. Close to 55% of the injured teens interviewed reported anticipating permanent effects as a result of their injuries. Of these, 20% expected permanent loss of sensation, impaired movement, or feeling and an additional 20% expected persistent pain as a result of their injuries. Interviews also revealed the need for improved first aid and emergency response procedures in workplaces where teens are employed.

OHSP's efforts to enhance the surveillance system under this Cooperative Agreement yielded new insights about surveillance methods: statewide emergency department data are an important new population-based data source for work-related injuries to teens, complimenting sentinel case data provided by the sample of hospitals actively participating in the surveillance system; mailed

surveys of injured teens appear to be a viable and less resource intensive alternative to telephone interviews; and research oriented worksite investigations of non-fatal serious injuries are feasible whereas investigations of less serious injuries prove challenging and are best conceived of as worksite assessments rather than incident investigations.

OHSP had numerous successes in linking surveillance to practice. Surveillance findings were successfully used to promote a technological intervention to reduce burn injuries in the retail bakery industry, an industry comprised of small establishments. A bilingual sticker developed by OHSP for use on forklifts warning that teens cannot operate these machines was well received by local industry, and over 100,000 copies have subsequently been disseminated by the US Department of Labor nationwide. An ongoing interagency team to coordinate government efforts to promote safe and healthful work for teens in Massachusetts was established and worked to revise the state system for obtaining work permits. Collaborations facilitated by the project have lead to OSHA training for vocational educators who are in turn providing OSHA 10-hour training to vocational education students. OHSP also completed a manual on how to conduct surveillance of work-related injuries to teens which has been disseminated to other states and serves as a prototype for sharing surveillance methods.

SIGNIFICANT FINDINGS

Significant findings of this project fall into three general categories: 1) surveillance findings; 2) surveillance methods; and 3) intervention and prevention lessons.

Surveillance findings.

Work-related injuries to teens continue to be a significant public health problem in Massachusetts. Each year more than 300 teens filed workers' compensation claims for injuries resulting in five or more lost work-days, and hundreds more were treated in emergency departments. Four industries accounted for nearly sixty percent of the injuries: restaurants (32%), grocery stores (14%), nursing homes (6%), and department stores (5%).

Follow-up interviews with injured teens provide important information about the circumstances of injury and impact of non-fatal injuries to teens that is not currently collected at the national level or in other states. Information from these interviews, while not necessarily representative of the experience of all teens injured at work, underscored critical problems that need to be addressed:

- lack of health and safety training for teens;
- lack of compliance with the work permit provisions of the state child labor laws;
- inadequate supervision at work; and
- need for improved first aid and emergency response procedures in workplaces where teens are commonly employed.

Findings also suggest that many of these injuries will have long term impacts. Another important observation based on interview findings is that many of the injuries, with the exception of the most serious, appear to occur in jobs allowed by the child labor laws and in circumstances for which no specific OSHA standards apply. These include, for example, cuts and lacerations

associated with knives and case cutters, burns from hot substances, and back injuries associated with lifting.

Surveillance methods.

Surveillance findings demonstrate the importance of using multiple data sources to characterize both the magnitude and nature of work-related injuries to teens. Less than 3% of cases reported to OHSP were identified through both workers' compensation reports and emergency department records and the distribution of cases by nature of injury varied markedly by data source.

Monthly reports of teen occupational injury cases from the convenience sample of nine emergency departments participating in the surveillance system were a valuable source of sentinel cases but the data were not representative of teen cases treated in emergency departments statewide. The recently established statewide data based of all emergency department visits is a valuable new population-based data source. It is less useful for sentinel case surveillance as it is not currently available until six months after the date of injury and includes neither personal identifiers nor industry or occupation information.

Use of mailed questionnaires to collect information about the circumstances and impact of injuries from teens injured at work appears to be a reasonable, lower cost alternative to telephone interviews that can increase capacity to conduct case follow-up. The response rate for a pilot mailed survey was comparable to that of the telephone survey (53% vs. 50%). Demographic characteristics of respondents did not differ significantly by method, and the mail survey was comparable to the telephone survey narratives with respect to capturing information about event source of injury and equipment. Phone interviews captured more detailed information about medical treatment and employer response to incidents.

The lack of data on teen employment at the state level is a continuing challenge limiting the ability of the surveillance system to generate teen occupational injury rates by occupation, industry or geographic locale within the state. The sample size of the Current Population Survey in Massachusetts is too small to provide reliable estimates of teen employment at the detailed level. Information on number of teen workers and full-time employee equivalents is available for 16 and 17 year olds in the decennial census, however youth employment patterns may vary in intercensal years. Methods for improving estimates of youth employment in the states remain to be developed.

Intervention and prevention lessons.

Sentinel cases. Research oriented worksite investigations of serious non-fatal as well as fatal teen injury incidents are feasible and can generate important cases studies that can be translated into well-received hazard alerts. The combination of these case studies with the surveillance statistics is useful in garnering support for prevention. With the exception of the most serious injuries, it appears that relatively few cases reported to the surveillance system lend themselves to referral to enforcement agencies. Confidentiality considerations as well as timeliness are limitations as well as the lack of applicability of specific health and safety standards or Hazardous Orders. Field investigations of less serious injuries are challenging and are best conceived of as worksite

assessments rather than investigations of single incidents. Nevertheless these field investigations can provide important information about teen working conditions and employers' knowledge, attitudes, and practices regarding teen employees.

The vocational education community has few resources to call on for occupational safety and health. Neither public sector workers nor students are covered by OSHA in Massachusetts. Vocation education students are at risk of serious injury and in need of additional attention. Massachusetts educators are interested in collaboration with the health department to address this issue.

Broad-based prevention: State specific surveillance of work-related injuries to teens can provide important summary information that can be used to promote change in teen workplaces, including small workplaces that are difficult to reach. The ability to monitor injuries by establishment name led to the identification of a common teen injury across numerous establishments in a franchised retail bakery company. Presenting summary data across establishments to the company resulted in changes to the equipment to reduce burn injuries.

Collaboration among government agencies that share responsibility for protecting working teens at work can maximize limited government resources for prevention. Establishment of an interagency team on youth employment led to joint efforts to revise the work permit system, publish and disseminate health and safety materials and extend health and safety training opportunities in the state. State data highlighting health and safety concerns of teens can also play an important role in mobilizing the community to address teen health and safety issues. For example, increased awareness of problems in Massachusetts led to a community initiated task force on child labor that developed a blue print for action in Massachusetts and several community groups established peer teen leader groups addressing workplace safety.

TRANSLATION OF FINDINGS

Translation of findings is an integral component of the *Teens at Work: Injury Surveillance and Prevention Project*. Surveillance, by definition, includes the dissemination of surveillance findings to those in a position to use the data to take action. The Occupational Health Surveillance Program (OHSP) in the Massachusetts Department of Public Health not only provides information to stakeholders but has developed working relationships with stakeholders in the community to effect change. Intervention activities based on surveillance findings are carried out both directly by project staff and by staff working in collaboration with partners in the community to address identified risks. Notably there are important opportunities to address young worker health and safety through schools and community organizations as well the workplace and translation activities carried out in all three venues.

OHSP teen injury data reports and educational materials have been tailored to targeted audiences including employers, parents, teens, schools, health care providers and the public at large. A number of materials have been literally translated into other languages as well. Hundreds of these materials of have been disseminated. Translation activities extend beyond information dissemination. For example, OHSP findings regarding burns in the retail bakery industry were taken directly to the owners and managers in the industry resulting in the retrofitting of coffee

equipment to reduce burns. The new Interagency Working Group on Youth Employment coordinated by project staff worked to revise the system for obtaining state work permits. Collaborations forged as part of the project led to health and safety training of vocational education students in schools. Teen peer leader groups addressing young worker health and safety were established in several community organizations. Occupational health was included on the adolescent health agenda for the state.

Findings regarding surveillance methods have informed changes in the surveillance system itself, which has subsequently been funded to continue for the next five years. Statewide emergency department data will routinely be used for case ascertainment, mailed questionnaires will be used to enhance case follow-up capacity, field investigations of serious non-fatal incidents will continue and investigations of less serious incidents will be carried to increase understanding of working conditions in target industries where multiple, but less serious injuries occur. The comprehensive manual on how to conduct surveillance has only recently been disseminated to other states. OHSP will remain available to provide technical assistance to other states working to implement surveillance of work-related injuries to youths, thereby extending the reach of the project.

SCIENTIFIC REPORT

Introduction

The initial *Teens at Work* Cooperative Agreement project period was September 30, 2000 to September 29, 2003. Project activities were continued through April 2004 with carry over funds approved for use on a no cost extension. This final report begins with a brief statement of the problem and background information on work prior to September 2000. Project activities and accomplishments from September 30, 2000 to April 30, 2004 are then summarized. The information is organized according to the six aims in the Cooperative Agreement application.

Background and Significance

Work is an integral part of adolescent life in the United States. While employment can provide many important benefits, it also poses substantial health risks. Each year several hundred thousands of workers younger than age 18 are injured on the job. The occupational injury rate for teens has been found to be higher than the rate for adult workers and above the Healthy People 2010 target for adolescents (DHHS, 2000).

Extent of Youth Employment: According to federal statistics, 27% of all teens aged 16 and 17 in the United States – nearly 2.2 million youths – were employed at any given point in 2001 (BLS, 2002). Official statistics do not include working children under age 16 and substantially undercount the true number of working youths (Zierold, et al., 2004; Weller, et al., 2003; BLS, 1999). Surveys of youths themselves indicate that by the time they finish high school, 80% have worked (IOM, 1998). A 1997 nationwide survey found that 18% of high school students worked more than 20 hours per week during the school year (Resnick, et al., 1997). The majority of young workers are employed in part-time low-paying jobs, predominantly in the retail and service industries (IOM, 1998).

The proportion of teen workers in Massachusetts is even higher than the national average. In 2001, an estimated 34% of Massachusetts teens aged 16 and 17 - more than 50,000 youths - were employed at any given point (BLS, 2002). Surveys of Massachusetts high school students suggest that as many as 25% of working youths rely on their earnings to help support their families (Rauscher & Wooding, 1999; MDPH, 1997; Hicks, 1994). Ongoing educational initiatives to ensure a more highly skilled workforce add to the number of employed youths by increasing the number of high school students who work as part of their educational experiences. In Massachusetts, most communities participate in one of the 27 school-to-career partnerships and/or 16 Workforce Investment Boards for purposes of school-to-career activities--including placement of teens in jobs and other workplace experiences (Westrich, 2004). In 2003, 20,000 high school students were placed in internships in 7,900 workplaces across the state (Westrich, 2004).

The majority of Massachusetts teens are employed in the food service industry (27%) and retail trade (37%), predominantly grocery and department stores.¹ Eight percent are employed in health services. Based on U.S. Census, known to undercount immigrant populations, 7% of teen workers age 16 and 17 in Massachusetts are foreign born. While foreign born teens are somewhat less likely to be employed than native born teens overall, they are more likely to be employed in potentially higher risk jobs in manufacturing, waste remediation, and transportation and warehousing (U.S. Census, 2000).

The Extent of Injury among Young Workers: Injuries are the leading cause of death and disability among children over one-year-old in Massachusetts and in the United States (NCHS, 2000). Over the last decade, the contribution of occupational injuries to the overall burden of injuries among youths has emerged as a significant public health concern. Each year from 1992-2000, on average 67 youths younger than age 18 died from injuries at work nationwide. The types of events in which young workers were killed were similar to those for workers of all ages (NIOSH, 2003).

Nonfatal injuries far outnumber fatalities and no single data source captures all cases. Workers' compensation records reveal only part of the problem as many injured workers never enter the workers' compensation system (Azaroff, et al., 2002; Shannon & Lowe, 2002; Biddle, et al., 1998; Pransky, et al., 1999). There is some evidence that teens who sustain injuries at work may be even less likely than adults to file compensation claims (Rosenman, et al., 2000; Brooks & Davis, 1996; Fingar, et al. 1992). Based on a nationwide survey of employer injury logs, the Bureau of Labor Statistics reported that in 1993, there were an estimated 21,620 injuries and illnesses involving days away from work, to youth in private sector industries (CDC, 1996). Data collected from a sample of emergency departments nationwide indicate that approximately 77,000 workers less than age 18 were treated for occupational injuries in 1998 (NIOSH, 2003). Because there is evidence that only a third of work-related injuries are seen in emergency departments, it is estimated that nearly 230,000 adolescents were injured on the job in 1998 (NIOSH, 2003).

¹ The U.S. 2000 Census used NAICS codes which includes food services as a separate industry from retail, unlike the SIC codes.

In Massachusetts, a MDPH study based on emergency department records collected in the early 1980s found that 7-13% of all medically treated injuries to teens age 14 - 17 were work-related. For 17-year-olds, the estimate was as high as 26% (Brooks, et al., 1993). A MDPH analysis of workers' compensation records for the years 1987-1990 found more than 700 claims per year for 14 - 17-year-olds filed for injuries resulting in five or more lost workdays (Brooks & Davis, 1996).

The numbers alone constitute a significant public health problem. Moreover, because teens typically work part-time seasonal jobs, the numbers of injuries to young workers translate into high rates per hour worked. Healthy People Year 2010 calls for reducing work-related injuries among adolescent workers to no more than 3.4 cases per 100 full-time workers, a rate lower than the target rate of 4.6 cases per 100 full-time workers for adults (DHHS, 2000). Several studies have found that the injury rate for youth is currently higher than that for adults and clearly higher than the adolescent target (Jackson, 2001; Miller & Kaufman, 1998; BLS, 1996; Coleman & Sanderson, 1982). According to findings based on emergency department data, the estimated nationwide rate of work-related injuries to teens aged 15 - 17 was 4.9/100 full-time equivalent workers, compared to the rate of 2.9 for all workers age 15 years and older in 1998 (CDC, 2001). These rates do not take into account the types of jobs held by teens and adults; and it is not known if youth have higher rates of occupational injury than adults doing comparable work. The impact of these injuries on youths should not be underestimated. Injuries identified through emergency department records and workers' compensation claims are serious enough to result in medical care. Follow-up of a subset of cases seen in emergency departments nationwide found that as many as 25% experienced limitation in their normal activities for more than a week (Kells, 1997). The long-term human and economic costs of occupational injuries to youths have yet to be documented.

Child Labor Laws and Injuries to Young Workers: State and federal child labor laws are designed to protect youths less than age 18 from excessive or hazardous labor and reflect a long-standing societal viewpoint that youth deserve special protection in the workplace. Despite the common perception that illegal employment of youths is no longer a problem in the United States, it continues to be widespread (Kruse, 1997; GAO, 1990). While the association between injury and illegal employment remains to be formally evaluated, numerous studies indicate that illegal work is a contributing factor to the unacceptably large numbers of teens injured on the job annually (Knight, et al., 1995; GAO, 1991; Suruda & Halperin, 1991; WDLI, 1990). The federal and many state child labor laws have not been substantially revised in decades. Consequently many laws do not reflect changes in youth employment patterns, changes in the nature of work, and new knowledge about occupational health and safety risks. In 2002, NIOSH recommended changes in the hazardous orders contained in the Fair Labor Standards Act based on a review of the limited scientific evidence available (NIOSH, 2002). Increased surveillance and research are necessary to form a scientific basis for updating these statutes on an ongoing basis.

Potential Risk Factors for Young Workers: Like all new workers, youths are at increased risk simply from lack of work experience. Lack of health and safety training is a problem for young workers, especially in light of their inexperience. Surveys of working teens suggest approximately half receive no health and safety training either on the job or at school (Bowling, et al., 1998; Runyan, et al., 1997). Also, adolescence is a period of rapid change -- physical,

cognitive and psychosocial -- and the developmental characteristics of youths may increase their risk of occupational injury or illness. Young workers may not be able to reach parts of machines or may lack the strength required for certain tasks. Job-related back injuries have been shown to be a problem among teens, especially smaller workers (Parker, et al., 1994). Organ systems still maturing in adolescence may be more susceptible to ergonomic or chemical insults. In addition, fatigue from balancing work and school may contribute to injuries to young workers both on and off the job (WDLI, 1990; DOL, 1990; Carksadon, 1990). Finally, many of teens' positive traits - energy, enthusiasm, a need for increased challenge and responsibility, combined with a reluctance to ask questions or make demands on their employers -- can result in their taking on tasks for which they are neither prepared nor capable of doing safely. Surveillance plays a critical role in documenting the distribution of these potential risk factors and generating hypotheses for further etiologic research.

Need for State-Based Surveillance: Better information about the occupations, industries and circumstances in which young workers are injured on the job is essential in order to set research priorities and to target and evaluate prevention efforts. Surveillance of work-related injuries to teens can provide information to guide educational and regulatory interventions as well as the development of new control technologies. State surveillance data are important in setting state prevention priorities that can be obscured in national statistics. State-based surveillance can help identify the specific industries, occupations, workplaces and communities in which workplace hazards to teens need to be addressed. State and local data can also be a powerful tool when advocating for change at the local level. Perhaps most important, is the ability of states to actively link surveillance findings with intervention efforts at the worksite and in the community. A state-based surveillance system that includes case follow-up activities can also fill significant gaps in surveillance of occupational injuries to teens at the national level.

State-based surveillance of occupational injuries also provides valuable opportunities for surveillance research. By linking and comparing data from various existing state data sources, systematic omissions in the traditional data sources of occupational injury data, such as the BLS Annual Survey of Occupational Injuries and Illnesses can be identified. These potential biases are a particular concern for special populations of workers including youths. NIOSH has called for improved coordination of existing data sources and collection of more detailed information on circumstances surrounding injuries to improve surveillance at the state level (NIOSH, 1998).

In conclusion, occupational injuries to young workers are a significant public health problem that is demanding increased attention (NIOSH, 2003; OSHA, 2003). Teens are a special population of workers with special concerns and unique opportunities for intervention through schools and communities in addition to the workplace (IOM, 1998; CDC, 1995). These opportunities offer the potential for new partnerships among a wide range of stakeholders including parents, educators, employers, government agencies, and health care providers, as well as teens themselves. Lessons learned in reaching out to young workers can also have important implications for reaching other populations of workers, such as immigrant workers, whose occupational health needs have not been well addressed and who are often employed in the same low-paid jobs. Finally, efforts to provide young workers with safe and healthful work experiences have the potential to influence the next generation of workers and employers

(Castillo, et al., 1999). A state-based surveillance system for work-related injuries to teens can provide essential information to guide these efforts.

Aims of the Cooperative Agreement

The Massachusetts Department of Public Health (MDPH) has identified the prevention of occupational injuries to children and adolescents as a public health priority. In 1992, MDPH promulgated regulations requiring physicians and hospitals to report occupational injuries to youths less than age 18 to the Department. In 1993, with support from NIOSH, the MDPH Occupational Health Surveillance Program (OHSP) established a model comprehensive surveillance and intervention system for occupational injuries to youth. Multiple data sources including workers' compensation records, emergency department (ED) reports, and hospital discharge data, were used for case ascertainment. Between 1993 and 1999, OHSP identified over 3,000 injuries to teens on the job. More than 500 follow-up interviews were completed, research oriented investigations by staff generated informative case studies, and multiple cases were referred to other agencies for worksite investigations. Aggregate data identified high-risk industries, occupations and communities and played a crucial role in fostering a variety of broad-based interventions.

Under this Cooperative Agreement, OHSP continued and enhanced the Massachusetts *Teens at Work Injury Surveillance and Prevention Project (TAW)*. The long-range goal of the project was to generate information necessary to reduce the incidence of work-related injuries to youths. The specific aims addressed during the project period were:

- Aim 1.** To maintain and enhance case ascertainment using multiple data sources to identify sentinel cases and generate meaningful summary data.
- Aim 2.** To conduct timely follow-up interviews with injured youths in order to fully characterize the cases and target worksite interventions.
- Aim 3.** To plan, conduct, and foster intervention and prevention activities to reduce the risk of occupational injuries to youths in targeted Massachusetts workplaces, industries, and communities.
- Aim 4.** To analyze and disseminate surveillance and intervention data to increase awareness of the occupational injuries to youths, promote prevention activities, and continue ongoing evaluation of the surveillance system.
- Aim 5.** To maintain and enhance collaboration between relevant state and federal agencies and among public health practitioners in Massachusetts to assure links between surveillance and intervention.
- Aim 6.** To provide guidance to other states in implementing the surveillance model, targeting northeastern states, in order to increase states' capacity to identify and prevent occupational injuries to youths.

This project was responsive to NIOSH's call for strengthening surveillance of special populations and addressed three NORA priority areas: special populations, traumatic injuries, and surveillance research (NIOSH, 2000; NIOSH 1996).

Activities and Accomplishments

Major activities undertaken to accomplish project aims are described in this section. Several unmet objectives as well as a number of new initiatives that were undertaken as a result of opportunities that emerged during the course of the project are discussed.

Surveillance Case Definition. In 1993, OHSP set out to develop a case-based surveillance system for "serious" occupational injuries to youths less than 18 years of age. Early on, however, it became apparent that with the exception of the relatively few cases that were clearly serious (e.g., amputations), it was not possible to distinguish serious from non-serious cases given the limited injury information contained in the primary data sources. Consequently, the surveillance case definition was recast to reflect this reality. The more encompassing case definition includes: medically treated occupational injuries to youths; occupational injuries to youths for which workers' compensation indemnity claims have been filed; and traumatic occupational deaths. Seriousness has continued to be a factor in setting priorities for follow-up. While not the focus of this surveillance initiative, illnesses are also documented.

Aim 1. To maintain and enhance case ascertainment using multiple data sources to identify sentinel cases and generate meaningful summary data.

OHSP uses the following multiple primary data sources to identify cases of occupational injuries to youths: workers' compensation indemnity claims for injuries resulting in 5 or more lost workdays; computer-generated emergency department (ED) reports from a self-selected sample of hospitals (these reports contain both personal and employer identifiers); hospital discharge records; reports from individual physicians; the Massachusetts Burn Registry; and the Census of Fatal Occupational Injuries (CFOI) and the Fatality Assessment and Control Evaluation (MassFACE) project.

This period OHSP followed the established protocols for using these data sources and a new system for tracking monthly reports from the participating emergency departments was implemented. Over 1,700 cases were identified during the project period. The great majority of cases were identified through workers' compensation records and the sample of emergency departments reporting cases to OHSP. Summary statistics on case ascertainment are included in Attachment 1.

The TAW surveillance system is intended to both identify sentinel cases for work-site follow-up and generate meaningful summary data to inform broad-based prevention efforts. Compensation data are derived from a statewide population-based data set allowing OHSP to examine patterns of injury statewide and to compute rates of "injuries for which claims have been filed." In contrast to the population-based nature of the workers' compensation data, the ED data come from a self-selected sample of EDs (9 of 84 EDs statewide). While these ED records are useful in identifying sentinel cases, the cases captured are not necessarily representative of all young

worker injuries treated in Massachusetts EDs and therefore are of limited use in documenting statewide injury patterns by occupation, industry, or nature of injury. As proposed, this period OHSP made use of a new surveillance system developed by the MDPH Injury Surveillance Program to assess the representativeness of the data reported by the EDs reporting to OHSP.

In 1998 the MDPH Injury Surveillance Program received funding from the National Center for Injury Prevention and Control to develop a model statewide, electronic E-coded surveillance system to track the incidence and causes of all injuries treated in EDs. This system, known as the Emergency Department Surveillance and Coordinated Injury Prevention System (ED SCIP), obtained monthly, electronic reporting of all E-coded injury visits from a representative sample of 20 EDs across the state. The sample of participating EDs was selected based on geographic region and annual number of ED patient visits. Statewide incidence estimates could be projected from the stratified random sample. The ED SCIP database contained two variables that could be used to identify work-related injuries: payer source (workers' compensation is one option) and an explicit variable: "work-related injury."

OHSP collaborated with ED SCIP to obtain reports of all work-related injuries to persons younger than 18 years of age reported to ED SCIP in 2000. These data were used to document the statewide distribution of cases by age, gender, and nature of injury. Findings were compared with data from the EDs reporting to OHSP during the same time period. The TAW and ED SCIP cases were similar with respect to age and gender. Comparison by nature of injury proved challenging as it was coded differently in the two systems. In TAW, nature of injury was coded according to the Bureau of Labor Statistics Occupational Injury and Illness Classification (OIIC) System. In ED SCIP nature of injury was coded according to the International Classification of Disease (ICD). There is no precise crosswalk between these two coding systems, and it was necessary to combine some OIIC codes and ICD codes to make the data more comparable. The distributions of cases by nature of injury in TAW and ED SCIP were significantly different with proportionately more open wounds and contusions reported in ED SCIP system.

OHSP had also proposed to obtain teen injury cases from the ED SCIP hospitals on a monthly basis to augment the TAW surveillance system. While the ED SCIP database contained neither names of cases nor employer identifiers, for serious cases OHSP had proposed contacting hospital medical records departments to obtain additional personal information necessary for sentinel case follow-up. This was never implemented because of the development of a new statewide database of all emergency department visits that was implemented in 2002, replacing ED SCIP. OHSP subsequently conducted an analysis of work-related injuries to teens in the FY2002 statewide database. (See Attachment 2.)

OHSP has recently received funding to continue TAW for another five years and, on the basis of the findings during this project period, will routinely incorporate the use of statewide ED data for case ascertainment.

Two newsletters summarizing surveillance findings were published and provided as feedback to reporting hospitals during the project period. (See Aim 4 for more information about dissemination of surveillance findings.)

Aim 2. To conduct timely follow-up interviews with injured youths in order to fully characterize the cases and target worksite interventions.

The primary data sources described above contain only basic demographic, employment, and diagnostic information. Additional information is necessary to further characterize the cases and set priorities for workplace follow-up. OHSP staff interviews select cases by telephone using a structured questionnaire to: (a) further describe the incident and the injury; (b) document factors which may have contributed to the incident; and (c) determine if hazards are still present and whether or not workers are at risk. Educational materials on health and safety and child labor laws are sent to all interviewed youth. OHSP attempts to interview all cases that meet a standard definition of a serious injury (amputations, non-digital fractures and dislocations, concussions, chemical burns and exposures, multiple injuries) and all cases in selected subgroups defined by either industry or nature of injury or a combination of the two. Different subgroups are targeted sequentially over time.

Throughout the project period, cases were targeted for follow-up as per the criteria set forth in the cooperative agreement application (i.e., cases with serious injuries--to the extent that this can be determined, cases in which there appear to be child labor law violations, cases involving chemical exposures or repetitive strain injuries, and cases involving teens working in temporary personnel services or construction). Educational materials were sent to all 173 teens who completed interviews during this period.

While telephone interviews provide essential information they are resource intensive. As proposed, this period OHSP explored use of mailed questionnaires to increase capacity to collect case follow-up information. OHSP successfully piloted a self-administered mailed version of the telephone questionnaire with a representative sample of teens (n=70) who sustained burn injuries. The telephone questionnaire was shortened and modified to focus on burns. The response rate for the mailed survey was comparable to that of the telephone survey (53% vs. 50%). Demographic characteristics of respondents did not differ significantly by method, and the mail survey was comparable to the telephone survey narratives with respect to capturing event (97% vs 100%), source (97% vs 100%) and equipment (94% vs 100%). The completed mail surveys lacked some of the details in responses to open-ended questions that interviewers obtained on the telephone survey where they could ask follow-up questions. Recommendations to improve the mail survey to obtain more details were included in the final report of this pilot which is included as Attachment 3. Mailed questionnaires appear to be a reasonable, lower cost alternative to telephone interviews and OHSP will implement routine use of mailed surveys for targeted subgroups of injured teens in future work.

Aim 3. To plan, conduct, and foster intervention and prevention activities to reduce the risk of occupational injuries to youths in targeted Massachusetts workplaces, industries, and communities.

To accomplish the ultimate goal of reducing occupational injuries to youths in Massachusetts, it is essential that surveillance findings be linked with intervention efforts. Substantial emphasis this period was placed on intervention activities ranging from worksite investigations to

development and dissemination of educational materials and targeted industry outreach. These activities are discussed briefly below.

Worksite investigations

OHSP continued to refer priority cases to OSHA and/or to the Massachusetts Attorney General's Office, or the Wage and Hour Division of the U.S. Department of Labor, which are responsible for enforcing state and federal child labor laws, respectively. However, only 7 referrals to other agencies were made this period. Notably, OHSP has found that relatively few cases interviewed lend themselves to referrals to enforcement agencies. The majority of injuries, with the exceptions of fatalities and the most serious injuries, appeared to occur in jobs which are allowed under the current child labor laws and in circumstances for which no specific OSHA standards, only the general duty requirements, apply. Another practical challenge in referring cases to enforcement agencies is that OHSP is limited in what data can be released to other agencies without first obtaining permission from the injured teen. In no case can personal identifiers be released without permission, and in cases identified through workers' compensation it is necessary to obtain permission from the injured teens prior to releasing employer names. Exceptions can be made in cases of a public health emergency. These restrictions often result in substantial time delays that limit the usefulness of the referrals or the information provided to the enforcement agencies is incomplete again limiting the ability of the enforcement agency to follow-up.

TAW staff have, however, been very successful in collaborating with the Massachusetts FACE program in conducting research oriented investigations of serious occupational injuries to youths. This period TAW staff worked with Massachusetts FACE in investigating three teen fatalities as well as several serious non-fatal injuries, generating two hazards alerts that were disseminated throughout the state. One fatality investigation prompted development of a hazard alert about forklifts and a bilingual 'forklift' sticker illustrating that teens may not operate these machines; 3,000 copies of the sticker were disseminated in MA. The United States Department of Labor subsequently reproduced this sticker and disseminated 100,000 copies nationwide. The second alert involved an incident in which a student amputated her fingers on an unguarded table saw in woodworking class at school. This alert was disseminated to all vocational schools in the state. OHSP worked closely with the Massachusetts Department of Education in investigating this incident, establishing a precedent for ongoing collaboration in addressing injuries in vocational education. (Copies of these alerts are included in the appendices of Attachment 4.)

As proposed, OHSP also piloted conducting research-oriented workplace investigations of select non-fatal teen injury cases using the FACE model. Several of these non-fatal investigations such as the one described above were very successful in leading to the development of prevention recommendations for broad-based dissemination. However, the investigations of less serious non-fatal cases were found to be particularly challenging. OHSP contracted with an experienced industrial hygienist to conduct research-oriented investigations of worksites where teens had experienced less serious injuries and to finalize written protocols for conducting these investigations. The contractor prepared written protocols and conducted a number of investigations, but confronted a number of specific difficulties. Both confidentiality considerations, which prevent the release of the injured teen's name, and lack of timeliness in conducting these

investigations (weeks to several months if we wait until teen interview is completed) were barriers to conducting true “incident” investigations. Nevertheless the contractor concluded that these investigations did provide important opportunities to learn more about teen working conditions in targeted industries, and employer knowledge, attitudes, and practices with respect to working teens. These assessments also served as a vehicle for providing information to employers. On the basis of this experience, OHSP has proposed to continue to conduct worksite follow-up prompted by non-fatal cases, recognizing that, in some cases, it will not be possible to complete “incident” reports. In these cases, the site visit will be used to assess the presence of ongoing hazards and employer, knowledge, attitudes and practices regarding young employees.

Development and Dissemination of Educational Materials

Throughout the project period, OHSP also continued its efforts to develop and disseminate educational materials on health and safety of young workers and the child labor laws. In addition to the two alerts and forklift sticker described above, OHSP completed a new educational brochure on workers’ compensation for teens, revised its previously developed materials on health and safety and child labor laws for parents, and translated the parent materials into Portuguese. The new workers’ compensation brochure together with materials on child labor laws and information about OSHA was sent to all interviewed teens. As proposed, OHSP worked with other state agencies, including the Department of Education, the Attorney General’s office, and the MDPH Adolescent and School Health Programs to broadly disseminate previously developed OHSP materials on health and safety and the child labor laws for teens, parents, employers, and health care providers. As a new initiative, copies of the *Employer Guide to Child Labor Laws in Massachusetts* were mailed to all employers identified through workers’ compensation claims filed by working teens in 2002 and 2003 along with a fax form to request more materials. Tens of thousands of these materials were printed and disseminated by OHSP and its partners.

Given the demand for the TAW materials, OHSP also worked this period to develop a database to track how many materials were being sent out, to whom, and when possible, how the person heard about the materials and how they planned on using them. An email account was also established specifically for this project to handle materials requests along with answering questions from the public regarding, for example, how to obtain work permits. In addition to the database developed for tracking materials, one was developed to track phone calls from the press and general public.

Also this period, TAW staff collaborated with OHSP’s burn surveillance team to develop a poster “First Aid for Burns in Restaurants” in English, Portuguese, and Spanish. A teen was enlisted to develop the poster. (See below for more information.)

Targeted Industry Outreach

As proposed, OHSP continued to explore opportunities to work with employers or targeted industries identified by the surveillance system as having high numbers of injuries. The following success story highlights use of surveillance findings this period to promote technological change to reduce hazards in an industry comprised of hard to reach small establishments.

Surveillance findings in 1999 revealed a high number of injuries to teens working in retail bakeries. Further analysis revealed that proportionally more teens aged 14 and 15 were injured in retail bakeries compared to other industries (20% vs. 12%). In striking contrast to findings for all industries combined, injuries to females outnumbered injuries to males by more than three to one (188 vs. 51). Heat burns and scalds accounted for over one-third of all the retail bakery injuries compared to 8% in all other industries. Follow-up interviews with teens burned in retail bakeries identified hot coffee--slurry from brew baskets in particular--as a common source of injury. Inadequate procedures for responding to injuries also appeared to be a problem. OHSP site visits at retail bakeries confirmed problems with the brew baskets. In February, 2000, OHSP presented these findings to over 400 retail bakery owners and managers as well as corporate staff in one franchise chain. In 2001, corporate headquarters, which specifies the equipment to be used in the franchise stores, required owners purchasing new equipment to install brew baskets with shields to prevent spillage; a retrofit for the brew baskets was also designed and available to owners not purchasing new equipment. In a second presentation to the owners and managers working for this bakery chain in 2003 OHSP surveyed those present to obtain information about ways in which OHSP might help them address safety in their workplaces. Prompted by input from bakery owners and managers, who requested materials in several languages, as well as interviews with teens sustaining burn injuries, OHSP worked with the Massachusetts Fire Marshall to develop a poster on First Aid for Burns in Restaurants. Almost 7000 copies of this poster (in English, Spanish, and Portuguese) have been distributed through the Massachusetts Restaurant Association, high school culinary arts programs, and local boards of health throughout the state. OHSP has continued to conduct follow-up with this retail bakery chain. Most recently they have reported new efforts to implement requirements that supervisors be onsite while teens are working. Headquarters has not, however, cooperated in distributing the burn posters to their franchisees as hoped.

Outreach to teens

As part of on-going prevention activities OHSP staff continued to work with community partners to promote the use of the teen health and safety curricula *Safe Work Safe Workers*, previously developed by OHSP. Staff served as master trainers, and provided train-the-trainer workshops to teachers, OSHA compliance assistance specialists, and peer leaders as well as School-to-Career staff. OHSP staff also provided annual health and safety training to vocational educators at their summer training institute in the first three years of the project.

OHSP's efforts to encourage inclusion of health and safety training in vocational education contributed to the development of an Alliance between Region I OSHA, the MA Department of Education, the MA teachers unions, the MA Division of Occupational Safety, and the MA Association of Vocational Administrators to provide OSHA 40-hour trainings to vocational educators throughout the state. OHSP has participated in these training sessions providing additional information about teen workers health and safety and the child labor laws. The trained educators are in turn teaching the 10-hour course in their classrooms resulting in students graduating with their OSHA 10-hour cards.

Additional intervention and prevention activities are discussed below under Aim 5: Collaboration.

Aim 4: To analyze and disseminate surveillance and intervention data to increase awareness of the occupational injuries to youths, promote prevention activities, and continue ongoing evaluation of the surveillance system.

OHSP maintained the TAW relational database system to facilitate case management and data analysis. Established protocols were followed for coding industry, occupation, nature of injury, and body part for all cases reported during the project period. All interviews from this period were coded for industry, occupation, nature of injury, body part, source, and event. Summary data analysis was carried out periodically and included in the TAW newsletters. Approximately 2000 copies of two TAW newsletters, which include summary data on injuries sustained by teens were disseminated this period. Surveillance findings were also included in the NIOSH Worker Health Chart Book (2003) and presented at numerous local, state, and national (and one international) meetings; these included for example: The American Public Health Association, The Maine Occupational Research Agenda, The Council of State and Territorial Epidemiologists, and the international symposium on “Youth and Work” held in Finland. In addition, a number of articles have appeared in the popular press that have contained Massachusetts findings or quotes from teens from the surveillance system who had given permission to be interviewed by journalists including, Readers’ Digest, Women’s Day, the Boston Globe, and the Boston Herald.

As proposed, substantial effort this period was devoted to exploring alternative sources of employment data for generating teen occupational injury rates. OHSP explored two different sources of statewide employment data for calculating rates: the Current Population Survey (CPS) and the US Census. The CPS is a monthly survey of about 60,000 households nationwide conducted by the Census Bureau for the Bureau of Labor Statistics. It provides a comprehensive data set on the labor force, employment, unemployment, and persons not in the labor force. Data on industry, occupation, weeks worked, and hours worked per week in the past year are available for people 15 years of age and older. While the CPS provides reliable data for computing teen injury rates at the national level, the Massachusetts sample size is too small to provide reliable estimates of teen employment broken down by industry or occupation. The Census Bureau conducts the national census every ten years, collecting basic demographic (age, gender, race, ethnicity) and housing information for everyone. For a 15% sample, employment information is collected for those 15 years or older. Employment variables include: employment status, current industry, occupation, and hours worked per week and weeks worked during the previous year. Data from this long form is used to generate the 5% Census sample. Data from this 5% sample can be used to estimate the statewide number of workers and full-time equivalents (FTE’s) by industry and occupation for 16 and 17 year olds. The limitation of using Census data is that the information is only updated every ten years. Youth employment patterns may vary in the interim.

Because of the limitations of CPS data, OHSP elected to focus on methods for using the Census data. Original attempts to combine Massachusetts Census data from 1990 and 2000 to either generate average industry specific employment figures or generate employment projections for the decade proved challenging due to changes in the industry coding systems used. The 1990 Census used the 1987 Standard Industrial Classification (SIC) System, whereas the 2000 Census

used the 1997 North American Industry Classification System (NAICS). There is no one to one cross walk between the two systems. Having access to employer name for all cases enabled coding all the injury cases according to both 1987 SIC and 1997 NAICS but this did not address the denominator problem. Ultimately, the decision was made to use the 2000 Census data, which captures 1999 employment experience, as a midpoint denominator for calculating rates. A journal article summarizing findings from 1993-2003 is in progress as is a second article summarizing findings from teen interviews.

Surveillance findings to be presented in the articles demonstrate the importance of using multiple data sources to characterize both the magnitude and nature of work-related injuries to teens. Less than 3% of cases reported to TAW were identified through both workers' compensation reports and emergency department records and the distribution of cases by nature of injury varied markedly by data source. For example, among cases identified through workers' compensation reports, sprains and strains were the most common injury (half of all sprains and strains were to the back), while among cases identified through emergency department records, cuts and lacerations predominated. These findings, while not surprising, are an important surveillance reminder that "what one sees depends on what one looks at." In both data sources restaurants accounted for more teen injuries than any other industry, followed by grocery stores, nursing homes, and department stores. Information from interviews with injured teens, while not necessarily representative, highlights critical issues to be addressed. Almost half (47%) of the 758 injured teens interviewed since 1993 reported they had received no health and safety training and 14% were working with no supervisor on site at the time of injury. Interview findings also suggest that these injuries can have long-term impact. For example, of 319 teens anticipating any permanent effects as a result of their injury 20% expected permanent loss of sensation, impaired movement, or feeling and an additional 20% expected persistent pain as a result of their injuries. In addition interviews with teens revealed that there is a need for improved first aid and emergency response procedures in workplace where teens are employed. Data tables are included in Attachment 1.

Aim 5. To maintain and enhance collaboration between relevant state and federal agencies and among public health practitioners in Massachusetts to assure links between surveillance and intervention.

Collaboration between relevant agencies is essential to maximize use of limited state resources and to assure the critical link between surveillance and intervention. Collaboration with private sector is also essential to promote the intervention activities based on surveillance findings at the state and local levels.

Throughout the project period, OHSP dedicated substantial resources to building and maintaining partnerships with both government agencies and community partners. In 2001, the development of a community initiated young worker task force provided a unique and important opportunity to work with a wide range of stakeholders. The "Massachusetts Young Worker Initiative (MYWI) Task Force" was comprised of representatives from youth, community and health care organizations, schools, employers, unions and parents. Key government agencies served as technical advisors to the task force and OHSP took on the leading role in coordinating the meetings. The task force met monthly over an 18-month period and developed a

comprehensive state strategy to promote positive and safe employment for working teens in Massachusetts. The task force report, which includes 16 objectives and 38 specific recommendations, is intended as a blueprint for state policy makers to ensure positive and safe work experiences for youth. (See appendices in Attachment 4.) Five priority areas identified include:

- A strong statewide infrastructure, including a standing inter-agency working group;
- A central body, such as a non-governmental resource center, whose sole and ongoing function is to promote positive and safe working experiences for youth;
- Updated child labor laws that reflect current realities;
- An effective work permit process; and
- Increased awareness of employers, parents, health care providers, educators, researchers, and the community.

Since the release of the report in 2003, OHSP has taken the lead in organizing and chairing a standing interagency working group that includes representatives of the Massachusetts Departments of Labor, Education, Industrial Accidents, and Public Health, and the Massachusetts Office of the Attorney General as well as the OSHA and the Wage and Hour Division of the US DOL. The Interagency Working Group on Youth Employment (IWGYE), meets quarterly to coordinate ongoing activities, including for example, changing work permit forms to include the child labor laws and to require parent signatures, developing a web-based system to obtain work permit applications, joint presentations on child labor laws at school to career trainings, and printing and dissemination of OHSP educational materials. Proposed efforts to work with the MDPH Bureau of Family and Community Health to develop a dissemination plan for OHSP materials were expanded to include the all members of the IWGYE.

In addition, OHSP also worked closely with MDPH's Youth and Young Adult Working Group and Injury Prevention Working Group and had a number of successes in promoting the inclusion of occupational health considerations in ongoing adolescent health and general injury prevention activities. These include:

- Injury prevention identified injuries to working teens as one of seven state injury prevention priorities.
- MDPH Director of Adolescent Health presented Teens at Work findings at the State Adolescent Health Coordinators annual meeting in Washington, DC in 2002.
- Safe workplaces for teens was included as a goal in the statewide policy plan for youth developed by Governor's Task Force for Youth.
- Articles on working teens were included in the MDPH injury prevention newsletter and the newsletter for state food inspectors.

During the project period, two community organizations established teen peer leader groups to address workplace health and safety issues: the Teens Lead @ Work Project initiated by the Massachusetts Coalition for Occupational Safety and Health and the GUMBWEB Project initiated by the Brazilian Immigrant Center. OHSP staff provided technical assistance and training to both groups. OHSP also continued its active involvement with the OSHA funded Young Worker Resource Network and coordinated workshops on young worker safety at the

Northeast Regional Occupational Health Surveillance annual meetings during each year of the project period.

Aim 6. To provide guidance to other states in implementing the surveillance model, targeting northeastern states, in order to increase states' capacity to identify and prevent occupational injuries to youth.

A number of states have expressed interest in initiating surveillance of work-related injuries to teens and in learning more about the Massachusetts TAW surveillance system. As proposed, this period OHSP collaborated with the Educational Development Center (EDC), a long-standing partner on teen health and safety issues, to develop a "how-to" guide for state-based surveillance of occupational injuries to youths. The guide is intended primarily to provide information on surveillance of teen work injuries to other states. It also intended to serve as a useful prototype for future guides for state-based surveillance of other targeted occupational endpoints.

As proposed, OHSP sought input from other states in developing the guide. At the Northeast Regional Occupational Health Surveillance meeting in spring 2001, OHSP held a workshop to obtain ideas from other NE states about what should be included in the guide. TAW staff worked closely with EDC health educators and editors in preparing the document. The development of the guide proved more challenging than anticipated. It was necessary to address a number of key issues: who is the audience, what voice should be used, what level of detail should be provided, and how to take into account differences among states. The EDC-TAW team decided to write for an audience of masters level public health practitioners, with public health knowledge but not necessarily informed about occupational health. They choose an active first person voice, and described what OHSP does in Massachusetts rather than telling others what they should be doing in their states. The guide includes a fair level of detail because the purpose was to provide specific guidance. Included throughout are comments about how things may differ in other states. OHSP staff gave an oral presentation entitled "Development of a 'How-to' Guide for Conducting Surveillance of Work-Related Injuries to Adolescents" at the 2003 annual meeting of the Council of State and Territorial Epidemiologists, and solicited volunteers to review the document. The draft was forwarded to a number of states for review, including the NE states. The final document, completed in 2004 is enclosed as an Attachment to this report. Copies were made available through an announcement on the national 'YouthWork' listserve. To date approximately 30 copies have been distributed upon request. An announcement and order form for the guide was also included in the Young Worker Resource Center annual mailing. The Labor Occupational Health Program at UC Berkeley and OHSP are both working to place it on their websites.

OHSP had also proposed to work with NIOSH, the SOSOC, and CSTE in defining a minimum surveillance data set, standardized nomenclature, and data coding protocols, in order to facilitate data aggregation across states. Because the surveillance model has not yet been implemented in other states, OHSP did not proceed with this task.

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PUBLICATIONS

The following educational materials were either developed or updated this project period:

Protecting Young Workers: A Guide for Building a State Surveillance System for Work-Related Injuries to Youths

A how-to guide on conducting surveillance for work-related injuries to youths.

Are You a Working Teen?

Pamphlet for teens contains child labor laws and related information.

Inclusion Enrollment Report**This report format should NOT be used for data collection from study participants.****Study Title:** Enhanced Surveillance of Occupational Injuries to Minors6149 through 12/03, data**Total Enrollment:** provisional pending final edits **Protocol Number:** _____**Grant Number:** U01 OH07301-02**PART A. TOTAL ENROLLMENT REPORT: Number of Subjects Enrolled to Date (Cumulative)
by Ethnicity and Race**

Ethnic Category	Sex/Gender			
	Females	Males	Unknown or Not Reported	Total
Hispanic or Latino	48	101	0	149 **
Not Hispanic or Latino	656	1,135	1	1,792
Unknown (individuals not reporting ethnicity)	1,508	2,556	144	4,208
Ethnic Category: Total of All Subjects*	2,212	3,792	145	6,149 *

Racial Categories

American Indian/Alaska Native	0	0	0	0
Asian	9	13	0	22
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	38	59	0	97
White	606	1,057	0	1,663
More Than One Race	0	0	0	0
Unknown or Not Reported	1,559	2,663	145	4,367
Racial Categories: Total of All Subjects*	2,212	3,792	145	6,149 *

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	0	0	0	0
Asian	0	0	0	0
Native Hawaiian or Other Pacific Islander	0	0	0	0
Black or African American	0	0	0	0
White	1	3	0	4
More Than One Race	0	0	0	0
Unknown or Not Reported	47	98	0	145
Racial Categories: Total of Hispanics or Latinos**	48	101	0	149 **

* These totals must agree.

** These totals must agree.

Department of Health and Human Services
Final Invention Statement and Certification
(For Grant or Award)

DHHS Grant or Award No.

U01/OH07301

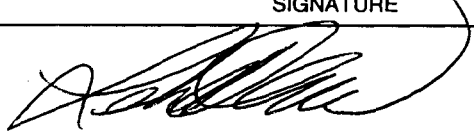
- A.** We hereby certify that, to the best of our knowledge and belief, all inventions are listed below which were conceived and/or first actually reduced to practice during the course of work under the above-referenced DHHS grant or award for the period

09/30/2000 through 04/30/2004
original effective date date of termination

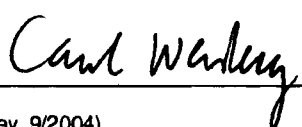
- B. Inventions** (Note: If no inventions have been made under the grant or award, insert the word "NONE" under Title below.)

NAME OF INVENTOR	TITLE OF INVENTION	DATE REPORTED TO DHHS
	NONE	
(Use continuation sheet if necessary)		

- C. First Signature** — The person responsible for the grant or award is required to sign (in ink). Sign in the block opposite the applicable type of grant or award.

TYPE OF GRANT OR AWARD	WHO MUST SIGN (title)	SIGNATURE
Research Grant	Principal Investigator or Project Director	
Health Services Grant	Director	
Research Career Program Award	Awardee	
All other types (specify):	Responsible Official	

- D. Second Signature** — This block **must** be signed by an official authorized to sign on behalf of the institution.

Title Chief Financial Officer		Name and Mailing Address of Institution Massachusetts Department of Public Health 250 Washington Street Boston, MA 02108-4619
Typed Name Carol Weisberg		
Signature 	Date 10/12/05	

Under 18 and hurt on the job?: Information on Workers' Compensation

Pamphlet for teens on workers' compensation.

Massachusetts Employers' Guide: Young Worker Health & Safety and the Child Labor Laws

Recommendations for employers and a poster of the child labor laws applicable in Massachusetts.

Protecting Your Working Teen: A Guide for Parents

One sheet version of former pamphlet containing child labor laws and related information. Available in English and Portuguese.

Protecting Working Teens: A Guide for Health Care Providers

Pamphlet for health care providers with information about child labor laws and what to talk to teens about regarding work.

Preventing Work-Related Injuries to Teens: Newsletter from the Teens at Work Injury Surveillance and Prevention Project

Biannual newsletter published by the Teens at Work Project. (2001, 2003)

First Aid for Burn Poster in Restaurants

This is a poster on first aid for heat burns in restaurants available in English, Spanish, and Portuguese.

In addition two peer reviewed journal articles are in progress.

GENDER AND MINORITY SUBJECTS

See the attached 'Inclusion Enrollment Report' and Children section below.

CHILDREN

Data collected was used solely for the purpose of surveillance and its specified activities. No youth under age 18, including women and minority youths, who either lives in Massachusetts or was injured in Massachusetts, whose work-related injury was reported to OHSP, was excluded from the surveillance system.

MATERIALS AVAILABLE FOR OTHER INVESTIGATORS

Interview materials and "Protecting Young Workers: A Guide for Building a State Surveillance System for Work-Related Injuries to Youths" are available for other researchers. Materials can be obtained from the Principal Investigator on request.