NATIONAL OCCUPATIONAL RESEARCH AGENDA (NORA)

04/14/09 Revision

NATIONAL PUBLIC SAFETY AGENDA

FOR OCCUPATIONAL SAFETY AND HEALTH RESEARCH AND PRACTICE IN THE U.S. PUBLIC SAFETY SUB SECTOR

Developed by the NORA Public Safety Sub Council

http://www.cdc.gov/niosh/nora/comment/agendas/pubsafsub/pdfs/PubSafSubApr2009.pdf

Table of Contents

Note: Bookmarks are provided for topic navigation.

National Occupational Research Agenda: Pubic Safety Sub Sector

The NORA Public Safety Sub-Sector is a part of the NORA Services Sector industry groups. In 2006, the Bureau of Labor Statistics (BLS) estimated nearly 2 million career public safety workers were employed in corrections, emergency medical services, fire fighting, and law enforcement. Volunteers nearly equivalent in number provide fire fighting and emergency medical services in many locations throughout the country. A variety of occupational hazards potentially affect the health of these workers.

The NORA Public Safety Sub Council was convened on November 15, 2006 and held additional meetings in May and December 2007. The council examined summaries of the stakeholder input that had been received during Town Hall meetings between December 2005 and December 2006 and the comments that were submitted through the NIOSH website during the same period.

Occupational safety and health surveillance data for public safety workers were reviewed and summarized for the Sub Council, primarily for years 2003 to 2005. BLS publishes annual fatality data for all public administration workers but only 24 states and 3 other jurisdictions submit data on public employee occupational injuries and illnesses that would be entered on the OSHA 300 Log. The available data are most reliable for occupational fatalities resulting from traumatic injuries. Significant gaps exist in data for all occupational injuries and illnesses among public safety workers.

The Sub Council decided to group its goals by the public safety sub sectors. At the May 2007 meetings, small groups discussed the current knowledge related to exposures, illnesses, injuries and fatalities in the sub sectors. Gaps in knowledge and intervention opportunities were identified and sets of related goals were drafted. The small group goals were consolidated and the versions of the draft goals were revised. The draft goals were made available for public comment on February 29, 2008. Two comments emphasized the importance of reproductive health and the goals were modified to include these issues. The sub-council finalized the goals on March 4, 2009.

The industry experts, labor representatives, academic investigators and public health practitioners that make up the NORA Public Safety Sub Sector Council identified research and intervention goals for the four public safety sub sectors. The goals appear in the following order in this document.

1. Fire Service
2. Law Enforcement
3. Corrections
4. Emergency Medical Services

Resources

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition, Fire Fighting Occupations, http://www.bls.gov/oco/ocos158.htm (accessed February 15, 2008).

Houser AN, Jackson BA, Bartis JT, Peterson DJ, Emergency Responder Injuries and Fatalities: An Analysis of Surveillance Data, TR-100-NIOSH, Rand Corporation, March 2004. (Prepared for the NIOSH National Personal Protective Technology Laboratory)

Michael J. Karter, Jr. & Joseph L. Molis, Firefighter Injuries in the United States, National Fire Prevention Association, October 2006.

National Law Enforcement Officers Memorial Fund, Research Bulletin: Law Enforcement Officer Deaths, 2007, December 2007.

Rita F. Fahy, Paul R. Leblanc, Joseph L. Molis, Firefighter Fatalities in the United States – 2006. National Fire Protection Association, June 2007.

Types of Goals

Strategic Goal - A top-level goal that states desired improvement of measureable outcomes.
Intermediate Goal – Secondary level goal that states a step or activity that partner organizations and individuals can complete using outputs from research, translation or dissemination goals.
Research Goal – Identifies the information gap and research mechanism required for achievement of higher-level intermediate goal.
Translation Goal – Use of new or existing knowledge to develop effective communications targeted specifically for application by workers, supervisors and owners in order to reduce injury and illness risks.
Dissemination Goal – Partner activities that are needed to ensure effective communication materials reach the work place and their content is recognized as authoritative.

Notes

Strategic goals target reductions in illnesses, injuries or fatalities of a certain percent. The **baseline** date for the reductions may be assumed to be 2006 unless otherwise specified.

Some goals may address **lost work day** injuries or illnesses, also known as **days-away-from-work**. The magnitude of the number of lost work days is a measure of the severity of the illness or injury although it may also be affected by specific job requirements, among other factors.

Strategic goals for the Services Sector, other than the **Public Safety** Sub-Sector, have been established by NORA Services Sector Council and appear in a separate document.

Periodic updates to the agenda and other products of the Sub-Council will be available from http://www.cdc.gov/niosh/nora/councils/serv/pubsaf/pubprod.html.

NORA Public Safety Sub Council

External Members
Brett Bowman, Assistant Chief, Prince William County Fire & Rescue
Jefferey L. Burgess, Mel and Enid Zuckerman College of Public Health, University of Arizona
Marc H. Caplan, Chief, Operational Technologies Division, National Institute of Justice
Elizabeth Currier, State Associations Manager, International Association of Chiefs of Police
Richard M. Duffy, Assistant to the General President, International Association of Fire Fighters
Kitty H. Gelberg, Chief, Epidemiology and Surveillance Section, New York State Department of Health
William J. Johnson, NORA Public Safety Sub-Council Co-Chair, Executive Director, National Association of Police Organizations
Seth Seabury, Economist, RAND
Gwyn Smith-Ingley, Executive Director, American Jail Association (Alternate Rick Neimiller)
Kevin M. Sommers, Chairman, Safety and Technology Committee, Fraternal Order of Police and Lieutenant, Warren Michigan Police Department
Tracy A. Thomas, Chief Operating Officer, Richmond Ambulance Authority (former member)

NIOSH Members
Luenda E. Charles, Sub-Council Assistant Coordinator, Health Effects Laboratory Division, NIOSH
Tom Hales, Division of Surveillance, Hazard Evaluations and Field Studies, NIOSH
Bill Haskell, Sub-Council Assistant Coordinator, National Personal Protective Technology Laboratory, NIOSH
Paul Moore, Division of Safety Research, NIOSH
Dori Reissman, Office of the Director, NIOSH
Terri Schnorr, NIOSH Services Sector Program Manager, Division of Surveillance, Hazard Evaluations and Field Studies, NIOSH
David Utterback, NORA Public Safety Sub-Council Co-Chair and NIOSH Services Sector Program Coordinator, Division of Surveillance, Hazard Evaluations and Field Studies, NIOSH

FIRE SERVICE

The Bureau of Labor Statistics estimated 361,000 workers were employed as paid career firefighters in 2006. Fire fighters held about 293,000 jobs, first-line supervisors/managers of fire fighting and prevention workers held about 52,000, and fire inspectors and investigators held about 14,000 jobs. These estimates exclude approximately 800,000 volunteer fire fighters, who perform the same duties. The U.S. Fire Administration estimates that about 71 percent of fire companies were staffed entirely by volunteer fire fighters in 2005. Many municipalities have combined fire prevention, public fire education, safety, and emergency medical services in single organizations. Over the past 5 years, an average of about 100 fire fighter line-of-duty deaths per year has occurred. Almost half of these deaths resulted from a cardiovascular event. NFPA estimates that 80,100 firefighter injuries occurred in the line of duty in 2005, an increase of 5.6% from the year before. Almost half (48.6%) of the all firefighter injuries occurred during fireground operations. Exposures to chemical and physical agents during these operations may result in increased risks for diseases such as but not limited to cardiovascular disease, cancers, and reproductive health disorders. (Wild land fire fighting is part of the NORA Agriculture, Forestry and Fishing (AFF) Sector.)

Strategic Goal 1: Reduce the incidence of chronic and acute diseases by 30% in firefighters that may be related to occupational exposures such as heat, combustion products and other stressors by 2015.

Intermediate Goal 1.1: Create health communication documents that are based on observed associations between occupational exposures and acute and chronic diseases, including cancer, among firefighters in collaboration with fire service stakeholders.

Research Goal 1.1.1: By 2009, develop a peer-reviewed protocol to conduct an epidemiologic study of chronic disease among fire service personnel, including retirees.

Research Goal 1.1.2: By 2012, determine the acute cardiovascular effects of exposure to combustion products and heat during firefighting.

Research Goal 1.1.3: By 2013, complete epidemiologic analyses of chronic disease and evaluate relations between disease risks and occupational exposures among fire fighters.

Research Goal 1.1.4: By 2013, identify and develop assays for biomarkers of exposures and early detection of cancers and cardiovascular diseases among firefighters.

Research Goal 1.1.5: By 2013, identify the cellular mechanisms of occupational respiratory diseases among fire fighters.

Translation Goal 1.1.6: By 2014, use social marketing methods to create health communication materials for specific occupational health issues associated with chronic disease in the fire service.

Dissemination Goal 1.1.7: On an ongoing basis, distribute effective health communication materials to all fire stations and to fire service consensus standard groups through fire service

organizations.

Intermediate Goal 1.2: Characterize firefighter exposures and exposure routes such as inhalation, dermal and ingestion pathways for elements, chemicals, and particulates, and develop evidence-based interventions based on field studies by working with the research community and fire service stakeholders.

Research Goal 1.2.1: By 2009, collect exposure data and document hazard pathways during structural firefighting and overhaul operations, and vehicle, vegetation and dumpster fires.

Research Goal 1.2.2: By 2011, evaluate existing surveillance programs regarding the collection of heat stress information during firefighting operations.

Research Goal 1.2.3: By 2011, complete benchmark studies of existing incident management procedures for mitigating the effects of heat stress during fire fighting operations.

Research Goal 1.2.4: By 2012, develop a systematic plan for the collection of take-home toxin exposures for the fire service.

Translation Goal 1.2.5: By 2012, create guidance documents with effective, evidence-based interventions for potential inhalation, dermal and ingestion exposures to vapors, gases and particulate matter.

Dissemination Goal 1.2.6: By 2012, ensure that guidance documents are distributed by fire service organizations to all fire stations and to fire service consensus standards organizations.

Intermediate Goal 1.3: Develop better exposure control technologies, work practice and operating procedures for fire fighting operations through work with fire department management and labor and professional organizations by 2012.

Research Goal 1.3.1: By 2009, evaluate limitations in current personal protective equipment (PPE) and protective performance enhancements to PPE materials, technologies and equipment.

Research Goal 1.3.2: By 2009, identify limitations of current engineering controls that are used to reduce hazardous firefighter exposures.

Research Goal 1.3.3: By 2009, characterize firehouse exposures including diesel exhaust, mold, and secondary exposures from contaminated equipment.

Research Goal 1.3.4: By 2011, identify additional technology or work practices to minimize exposures to potentially hazardous materials in fire stations or from contaminated equipment.

Translation Goal 1.3.5: By 2011, ensure that technological or work practice changes are widely known to fire service personnel through the existing communication channels.

Intermediate Goal 1.4: Create and promote best practice guidelines for medical surveillance systems and wellness programs for fire fighters by 2012 through work with professional, labor, local and state organizations and government agencies.

Research Goal 1.4.1: By 2009, identify established medical surveillance and wellness programs that include fitness evaluations and injury and illness surveillance systems for fire service personnel.

Research Goal 1.4.2: By 2011, examine the cultural and economic barriers to implementing wellness and fitness programs within fire departments.

Translation Goal 1.4.3: By 2011, collaborate with established program principals to produce a guidance document that describes the relations among essential surveillance and wellness program components, the ongoing analysis and feedback of intermediate results, and estimates of costs for the programs.

Translation Goal 1.4.4: By 2011, establish practice partnerships to develop, employ and evaluate alternative medical surveillance and wellness program elements.

Translation Goal 1.4.5: Beginning in 2012, produce annual reports on the nature of injury and illness that result in fire service personnel disabilities based on effective surveillance and wellness program information.

Intermediate Goal 1.5: Characterize occupational and non-occupational risk factors for cardiovascular disease in firefighters by 2012 and identify effective interventions by working with labor and professional organizations and medical care providers.

Research Goal 1.5.1: By 2012, conduct research studies to determine the relations between occupational stressors (psychological and physical) and cardiovascular disease in firefighters.

Research Goal 1.5.2: By 2012, conduct research studies to evaluate relationships between fire service work organization parameters and perceived stress.

Research Goal 1.5.3: By 2013, investigate biological mechanisms between psychosocial and physical stressors and sub clinical markers of cardiovascular disease.

Translation Goal 1.5.4: By 2014, create effective evidence-based interventions for occupational and non-occupational cardiovascular disease risk factors and disseminate the information to career and volunteer fire service personnel through existing organizations.

Intermediate Goals 1.6: Evaluate and improve medical rehabilitation programs for firefighters by 2012 through work with fire department management, labor unions, and medical service providers and disseminate intervention strategy information through partners and professional organizations.

Research Goal 1.6.1: By 2009, establish a process to identify critical elements for successful medical rehabilitation programs across fire services.

Research Goal 1.6.2: By 2011, evaluate cost-effectiveness and efficacy of medical rehabilitation programs for firefighters.

Translation Goal 1.6.3: By 2012, complete benchmarks of existing medical rehabilitation programs that address traumatic stress issues such as grief and post-incident counseling.

Strategic Goal 2: Reduce injuries and fatalities associated with structural firefighting operations by 30% by 2015.

Intermediate Goal 2.1: Improve injury surveillance data collection and identify the mechanisms and occupational settings of injuries sustained during structural firefighting operations by 2012 through the collaboration of fire service management, labor, and consensus organizations.

Research Goal 2.1.1: By 2009, evaluate existing surveillance systems for occupational injuries among fire fighters.

Research Goal 2.1.2: By 2010, document steps for improvement in these surveillance systems (e.g., accuracy of data collected, inclusion of all relevant variables, and representation of fire fighters in various geographical locations).

Translation Goal 2.1.3: By 2012, develop an injury surveillance system for the fire service with the detailed data elements on the event, nature, sources and severity of injury, and ensure that information is collected at a central repository.

Intermediate Goal 2.2: Develop safety interventions as directed by injury surveillance and investigative data (e.g., slip, trip, and fall hazards and lifting) by 2012 through work with fire service agencies and labor and professional organizations

Research Goal 2.2.1: By 2010, identify and evaluate existing interventions for the leading injury risks.

Translation Goal 2.2.2: By 2012, ensure that effective interventions are available for the leading injury risks and develop new interventions as needed.

Dissemination Goal 2.2.3: By 2012, disseminate information on effective interventions to all fire service agencies through web sites and trade publications

Intermediate Goal 2.3: Collaborate with equipment manufacturers to enhance fire ground communication between firefighters, company officers, safety officers and incident commanders by 2013.

Research Goal 2.3.1: By 2009, identify the technological limitations of existing

communication equipment during emergency fire ground operations including those that may occur during simultaneous operations with law enforcement and emergency medical services personnel.

Research Goal 2.3.2: Between 2009 and 2012, test effective advanced communication technologies.

Translation Goal 2.3.3: By 2013, mandate and implement best available communication systems for the fire service.

Intermediate Goal 2.4: Enhance firefighter safety by development of effective, practical and affordable personal location and tracking technologies and systems by 2013 through collaborative efforts of equipment manufacturers and fire service management, labor and consensus organizations.

Research Goal 2.4.1: By 2009, identify the technological limitations of existing locator equipment during emergency fire ground operations.

Translation Goal 2.4.2: By 2012, update equipment design specifications for adoption by consensus standard organizations and ensure notification of fire service companies.

Translation Goal 2.4.3: By 2013, mandate and implement best locator and tracking technology for the fire service.

Intermediate Goal 2.5: Create and validate technologies, systems and procedures for predicting structural collapse of building types by 2013 through research and development programs.

Research Goal 2.5.1: By 2012, identify and evaluate technologies and systems for predicting which building designs are more likely to collapse in a variety of fire conditions.

Translation Goal 2.5.2: By 2014, create, mandate and implement fire fighting procedures that limit fire fighter entries into buildings as they approach conditions that may lead to a structural collapse.

Strategic Goal 3: Reduce the incidence of vehicle-related traumatic injuries and fatalities by 50% in firefighters by 2015.

Intermediate Goal 3.1: Require the use of seat belts by all occupants in moving fire service vehicles by 2010 and identify limitations of existing restraint technologies through work with labor organizations, professional organizations and local government agencies and organizations.

Research Goal 3.1.1: By 2009, document extent of injuries and fatalities associated with non-use of seatbelts in fire service vehicles.

Research Goal 3.1.2: By 2009, determine cultural and behavioral characteristics related to why fire service personnel do not use seatbelts.

Research Goal 3.1.3: By 2012, complete investigation of technology alternatives to existing seatbelts and explore engineering redesign concepts.

Translation Goal 3.1.4: By 2013, implement improved educational campaigns and encourage the adoption of mandatory seat belt use policies, if still needed.

Intermediate Goals 3.2: Evaluate the effectiveness of current fire department policies and practices that have been adopted to reduce fatalities related to high-speed response and unsafe driving by 2015 through the collaborative efforts of fire service management, labor, government agencies and research organizations.

Research Goal 3.2.1: By 2010, systematically collect incident information to document and evaluate the extent of injuries and fatalities during response to fire emergencies in career and volunteer departments.

Translation Goal 3.2.2: By 2013, establish pilot programs to record fire service vehicle operation parameters using data recording systems for feedback and performance appraisal within fire departments.

Research Goal 3.2.3: By 2013, evaluate the effectiveness of interventions such as situational awareness training programs during actual fire service vehicle operation.

Translation Goal 3.2.4: By 2015, use social marketing methods to promote safe vehicle operations during fire service response through labor and professional organizations.

Intermediate Goal 3.3: Improve firefighting vehicle safety designs by 2015 through work with fire service stakeholders and vehicle manufacturers.

Translation Goal 3.3.1: By 2012, encourage the adoption and implementation of state and federal regulations requiring impact and crash testing of fire service response vehicles.

Translation Goal 3.3.2: By 2015, evaluate the needs for further safety improvements to fire service vehicles.

Strategic Goal 4: Reduce the incidence and severity of acute and chronic musculoskeletal disorders (MSDs) and injuries in the fire service by 2015.

Intermediate Goal 4.1: Characterize the incidence and prevalence of acute and chronic MSDs by 2012 through cooperation with firefighter organizations and labor unions.

Research Goal 4.1.1: By 2010, evaluate the relations between acute or sustained exertions and awkward body positions during fire fighting operations and occupational MSDs.

Research Goal 4.1.2: By 2012, create and distribute intervention recommendations following an analysis of various strategies to reduce the incidence of MSDs among fire service personnel through existing communication channels.

Intermediate Goal 4.2: Prepare a business case for prevention of musculoskeletal injuries among fire service personnel by 2012 by working with fire departments and local and state government agencies.

Translation Goal 4.2.1: By 2010, initiate a pilot project for the development of a business case model for reducing firefighter MSDs.

Translation Goal 4.2.2: By 2014, create and distribute recommendations for MSD prevention programs such as equipment design, ergonomics, PPE selection, physical conditioning and task duration management.

LAW ENFORCEMENT

Law enforcement agencies across the U.S. employ about 609,000 police and sheriff's patrol officers, slightly more than 100,000 detectives and other investigators, and almost 90,000 police dispatchers. Approximately 79% of police, sheriffs and detectives are employed by local agencies and about 11% by state police agencies. The leading causes of occupational fatalities among law enforcement personnel are vehicle crashes and homicide with an annual average of about 150 total fatalities over the past 5 years. The National Law Enforcement Officers Memorial Fund reported that 33% more police officers were shot and killed in 2007 when compared with 2006. The number of law enforcement officers killed in traffic-related incidents reached an all-time high of 81 in 2007, the 10th year in a row in which traffic incidents were the leading cause of officer deaths nationwide. As with other public administration workers, data on occupational injuries and illnesses among law enforcement personnel are not sufficient to track changes in frequency or severity over time. Exposures to biological, chemical and physical agents for law enforcement personnel have not been sufficiently evaluated. These exposures may result in increased risks for diseases such as but not limited to cardiovascular disease, cancers and reproductive health disorders.

Strategic Goal 5: Evaluate information sources collected by partners or stakeholders that may be enhanced or expanded to conduct effective occupational health and safety surveillance among law enforcement workers.

Intermediate Goal 5.1: Identify and evaluate existing databases that may be used for occupational health and safety surveillance at the Bureau of Labor Statistics, the Department of Justice, workers compensation carriers, retirement and disability programs, and state-based occupational health and safety programs.

Research Goal 5.1.1: By 2010, systematically identify, collect and describe the occupational exposure, illness, injury and fatality data sets that exist with law enforcement agencies and other organizations.

Research Goal 5.1.2: By 2011, determine the utility and limitations of individual or combined data sets to evaluate occupational health and safety risks for law enforcement workers.

Research Goal 5.1.3: By 2013, specifically identify gaps in individual or combined data sets for occupational surveillance and develop collaborative agreements with key partners to refine and expand data collection, if necessary, by 2013.

Intermediate Goal 5.2: Establish and evaluate model occupational health and safety surveillance systems by 2015 for exposures, illnesses, injuries and fatalities through collaboration with law enforcement, related government organizations, and other stakeholders and partners.

Research Goal 5.2.1: By 2010, conduct a workshop to identify procedures to collect

information about law enforcement officer suicides that may be used to develop appropriate interventions.

Research Goal 5.2.2: By 2011, conduct a workshop to develop a prioritized framework for an occupational surveillance system for cardiovascular and pulmonary disease, cancers, musculoskeletal disorders, and mental disorders including substance abuse among law enforcement workers.

Research Goal 5.2.3: By 2013, systematically collect and evaluate available information on exposures to chemical, physical and biological agents that are associated with law enforcement activities such as clandestine drug site investigation, hazardous material response, suspect or convicted offender contact, weapon firing and crime laboratories to identify the gaps in reliable exposure information.

Research Goal 5.2.4: By 2013, identify gaps in knowledge and complete additional data collection to characterize exposures and associated health effects among law enforcement personnel.

Research Goal 5.2.5: By 2015, institute and evaluate key components of an occupational health and safety surveillance system with one or more law enforcement agencies and related organizations.

Research Goal 5.2.6: On an ongoing basis, evaluate exposure, illness, injury and fatality surveillance information and identify needs for effective interventions.

Translation Goal 5.2.7: On an ongoing basis, publish trade journal articles and web site documents that describe effective workplace interventions to reduce law enforcement officer exposures, illnesses, injuries and fatalities.

Strategic Goal 6: Reduce traumatic injuries and fatalities resulting from vehicle collisions involving law enforcement personnel by 15% by 2015. Data collected for research under goals 6 and 7 shall be used only to identify and evaluate practices that help ensure public safety, and not for discipline against any individual officer or officers.

Intermediate Goal 6.1: Except as necessitated by law enforcement operations, require the use of seat belts by all occupants in all moving law enforcement vehicles by 2010 through work with labor organizations, professional associations and local government agencies and organizations.

Research Goal 6.1.1: By 2009, document the nature of injuries and fatalities and associated event and source information for police vehicle collisions when occupants failed to use seat belts.

Research Goal 6.1.2: By 2009, conduct a field survey to determine why police officers and other law enforcement vehicle occupants fail to use seatbelts.

Research Goal 6.1.3: By 2011, evaluate alternative engineering designs that overcome

reasons that seat belts are not used by police officers and other police car occupants.

Research Goal 6.1.4: By 2013, evaluate use of seatbelts or alternative restraint systems by individual law enforcement agencies.

Translation Goal 6.1.5: On an ongoing basis, track the use of seat belts or alternative restraint systems and vehicular injuries and fatalities in law enforcement personnel and translate study results into trade publications and law enforcement web site documents.

Translation Goal 6.1.6: By 2009, develop and disseminate health communication documents for effective seat belt use educational campaigns.

Dissemination Goal 6.1.7: By 2010, provide health communication materials that encourage adoption of seat belt use policies through law enforcement organizations and labor unions and describe the materials in trade publications and web sites.

Intermediate Goal 6.2: Disseminate information on effective policies and practices that have been adopted to reduce law enforcement fatalities due to high-speed driving during pursuit or call response by 2015 through collaboration of stakeholders and partners.

Research Goal 6.2.1: By 2010, document the nature of injuries and fatalities associated with high-speed driving of law enforcement vehicles.

Research Goal 6.2.2: By 2011, evaluate the effectiveness of interventions such as situational awareness and speed management training that address behavioral barriers to compliance.

Research Goal 6.2.3: By 2012, evaluate the use of vehicle operation recording systems through a government-funded program to purchase, install and maintain the equipment, and to evaluate the relationships between vehicle operation parameters and collision severity and consequences.

Research Goal 6.2.4: By 2014, establish an ongoing program to track changes in high-speed vehicular injuries and fatalities in law enforcement personnel.

Translation Goal 6.2.5: On an ongoing basis, translate the results of studies about situational awareness and speed management training into trade publication articles and postings on law enforcement web sites.

Intermediate Goal 6.3: Create and utilize data collection systems for evaluation of sleep deprivation and fatigue as factors in law enforcement officer injuries and fatalities through the collaborative efforts of law enforcement agencies and related organizations.

Research Goal 6.3.1: By 2009, develop data collection recommendations that will support the analysis of key relations among fatigue, sleep deprivation and vehicle-related injuries and fatalities.

Research Goal 6.3.2: By 2010, preliminarily determine the causes and extent of medically-evaluated officer fatigue through field evaluations.

Research Goal 6.3.3: By 2011, evaluate existing fatigue management and shift-work policies in other industries for possible application to law enforcement.

Research Goal 6.3.4: By 2012, evaluate the relation between officer or dispatcher fatigue and the frequency and severity of vehicle-related injuries and fatalities.

Research Goal 6.3.5: By 2013, establish partnerships with at least 3 law enforcement agencies to collect fatigue, sleep deprivation and vehicle-related incident data and its rigorous statistical analysis to identify and implement effective interventions.

Translation Goal 6.3.6: By 2014, develop evidence-based recommendations to reduce the incidence of sleep deprivation and fatigue among law enforcement officers and disseminate through police labor groups and management associations.

Strategic Goal 7: Reduce injuries and fatalities in law enforcement personnel from criminal assaults by 10% by 2012.

Intermediate Goal 7.1: Create and utilize data systems to determine the frequency and nature of officer injuries and fatalities from criminal assaults through work with law enforcement labor and management organizations and government agencies.

Research Goal 7.1.1: By 2010, evaluate the FBI Law Enforcement Officer Killed and Assaulted and other datasets to estimate frequencies and describe trends associated with use of weapons, other forms of physical assaults, and vehicle-related incidents.

Research Goal 7.1.2: By 2012, determine the leading mechanistic and circumstantial causal factors that are associated with changes in the risks for officer injuries and deaths due to physical assaults.

Research Goal 7.1.3: By 2012, evaluate the relation of officer physical fitness to the nature and severity of injuries from criminal assault.

Research Goal 7.1.4: By 2014, evaluate the effectiveness of PPE or other injury prevention methods that are used during physical assaults with suspects.

Translation Goal 7.1.5: On an ongoing basis, create health communication documents to describe effective assault-related interventions and disseminate through law enforcement agencies, professional associations and labor unions.

Intermediate Goal 7.2: Inform stakeholders and partners about key strategies, actions and equipment that reduce the risks of injuries and fatalities due to physical assaults by suspects.

Research Goal 7.2.1: By 2011, identify the behavioral and physical (e.g. facial or postural)

characteristics of individuals likely to initiate an assault on a law enforcement officer.

Research Goal 7.2.2: By 2011, evaluate effectiveness of training curricula that are used to help reduce the risks of law enforcement officer injury or fatality resulting from physical assaults.

Translation Goal 7.2.3: At least every 4 years and beginning in 2011 publish a report with recommendations for effective health and safety programs that reduce the risks for law enforcement officer injury or fatality due to physical assaults.

Strategic Goal 8: Reduce the incidence of cardiovascular disease disabilities and fatalities in law enforcement personnel by 15% by 2015.

Intermediate Goal 8.1: By 2013, determine the prevalence and occupational risk factors for cardiovascular disease among law enforcement officers through collaborative studies with partners and stakeholders.

Research Goal 8.1.1: By 2012, evaluate existing data sources for evaluation of line-of-duty cardiovascular deaths in law enforcement officers.

Research Goal 8.1.2: By 2012, develop and validate biomarkers for occupational stress associated with cardiovascular disease among law enforcement officers.

Research Goal 8.1.3: By 2013, conduct etiologic studies of occupational risk factors and cardiovascular disease in law enforcement officers.

Research Goal 8.1.4: By 2013, conduct research on the biological mechanisms involved in the association between risk factors and cardiovascular disease.

Research Goal 8.1.5: By 2013, evaluate the association of work organization factors such as job classification, shift-schedule, and overtime on cardiovascular risk and cardiovascular events.

Intermediate Goal 8.2: Evaluate worksite medical appraisal and wellness programs among law enforcement officers and, by 2014, develop and disseminate recommendations for effective program components through collaboration with law enforcement medical and health programs.

Research Goal 8.2.1: By 2010, identify representative wellness programs in use by law enforcement agencies and describe their essential components.

Research Goal 8.2.2: By 2012, evaluate the effectiveness and economics of existing wellness programs through examination of costs and the level-of-fitness among program participants.

Research Goal 8.2.3: By 2014, compare injuries and disabilities related to occupational risk factors across police departments with and without wellness programs by 2014.

Translation Goal 8.2.4: On an ongoing basis, produce documents for trade publications and law enforcement web sites that describe the benefits of effective medical evaluation and wellness programs on cardiovascular health.

CORRECTIONS

Correctional officers held more than 750,000 jobs in 2006 according to the American Correctional Association. The vast majority of these jobs were in State institutions or in local jails. Some 300 jails in large urban areas house over 1,000 inmates. Most correctional officers in jails, however, work in smaller facilities in rural areas. BLS reports that only 18,000 of the total jobs for correctional officers were in Federal correctional institutions, and about 16,000 jobs were in privately-owned and managed prisons. The number of occupational fatalities reported by BLS has averaged about 12 per year over the past 4 years. The fatalities have been nearly evenly divided between transportation incidents and violent acts. Insufficient information exists to track the frequency and severity of occupational injuries and illnesses for corrections personnel in the U.S. Several illnesses (e.g., cardiovascular disease, cancer, reproductive health disorders) may result from occupational exposure to biological, chemical, and physical agents. To date, very little evaluation has been conducted on occupational exposures in these workers.

Strategic Goal 9: Reduce occupational injuries and fatalities in corrections personnel by 20% by 2015.

Intermediate Goal 9.1: By 2015, ensure effective interventions are widely utilized to reduce corrections officials' traumatic injuries and deaths from inmate assaults through work with labor organizations, professional associations, and state and local government agencies.

Research Goal 9.1.1: By 2010, identify and systematically evaluate Institute of Justice, Office of Justice Programs data sets, disability insurance claims and other databases to estimate the frequencies, rates and trends of traumatic injuries and fatalities that result from inmate assaults.

Research Goal 9.1.2: By 2012, characterize the relations among mechanistic and circumstantial factors for correctional personnel injuries and deaths that result from inmate assaults.

Research Goal 9.1.3: By 2011, evaluate the effectiveness of training curricula that are used to reduce the risks of injury or fatality among corrections personnel.

Research Goal 9.1.4: By 2012, evaluate the relation of corrections officer physical fitness to the nature and severity of injuries from criminal assault.

Research Goal 9.1.5: By 2014, evaluate the effectiveness of PPE or other injury prevention methods that are used during inmate assaults.

Research Goal 9.1.6: By 2015, characterize the frequency and nature of psychological and emotional disorders among corrections personnel due to assault-related events.

Translation Goal 9.1.7: At least every 4 years and beginning in 2011, publish a report with recommendations for effective health and safety programs that reduce the risks of injury or death from physical assaults and disseminate through federal, state and local government

agencies, labor unions, and professional associations.

Intermediate Goal 9.2: Recommend effective interventions to reduce the frequency and severity of correctional personnel injuries or deaths from unintentional events through work with labor organizations, professional associations and federal, state, and local government agencies.

Research Goal 9.2.1: By 2009, evaluate Office of Justice Programs data, and disability, compensation and other databases to determine overall frequencies and severity of injuries including puncture wounds, lacerations, slips/trips/falls, and MSDs.

Research Goal 9.2.2: By 2012, characterize factors associated with unintentional injuries such as search techniques and inmate contact for corrections personnel injuries.

Research Goal 9.2.3: By 2012, evaluate the effectiveness of PPE, tools, policies and procedures in reducing unintentional injuries among corrections personnel.

Research Goal 9.2.4: By 2012, evaluate the relation between corrections personnel physical fitness and injuries or death from unintentional events including hazardous exposures.

Research Goal 9.2.5: By 2012, determine psychological consequences of unintentional injuries.

Translation Goal 9.2.6: By 2014, develop guidelines for prevention of unintended injuries in correctional institutions and disseminate through federal, state and local government agencies, labor unions, and professional associations.

Intermediate Goal 9.3: Provide corrections personnel with methods to predict and manage aggressive inmate behavior through work with labor organizations, federal, state and local government agencies and other stakeholder programs.

Research Goal 9.3.1: By 2012, evaluate the effectiveness of population management policies and procedures for potentially aggressive inmates.

Research Goal 9.3.2: By 2013, identify the behavioral, psychological, and physical (e.g. posture or facial expressions) characteristics of individuals who are likely to initiate an assault on corrections personnel.

Translation Goal 9.3.3: By 2015, ensure that methods identified through this program are reported in appropriate peer-reviewed journals and relevant findings are incorporated in training programs for corrections officials at all levels.

Strategic Goal 10: Reduce illnesses and injuries in corrections personnel from infectious disease exposures by 20% by 2012.

Intermediate Goal 10.1: Identify and implement methods that increase the effectiveness of infectious disease screening and control programs for inmates through work with local, state and

federal government agencies, labor organizations and professional associations.

Translation Goal 10.1.1: By 2010, promote the prioritization of corrections personnel for pandemic flu vaccinations in the earliest stages of a possible outbreak.

Research Goal 10.1.2: By 2010, identify the number and frequency of inmates with serious infectious diseases at intake into representative corrections facilities.

Research Goal 10.1.3: By 2012, evaluate the impact of limitations imposed by Health Insurance Portability and Accountability Act (HIPAA) on effective identification and management of serious infectious diseases among new and resident inmate populations.

Research Goal 10.1.4: By 2012, estimate the number and frequency of correction personnel infections that result from exposures during the admissions process.

Research Goal 10.1.5: By 2012, evaluate the effectiveness of current screening methods for serious infectious diseases and estimate the impact, including costs, of delayed identification of inmate infections.

Research Goal 10.1.6: By 2012, evaluate the effectiveness of ongoing periodic infectious disease screening programs for resident inmate populations.

Research Goal 10.1.7: By 2012, identify effective designs, use and maintenance of isolation units for inmates with serious infectious diseases in correction facilities.

Research Goal 10.1.8: By 2013, determine whether PPE or other tools effectively reduce serious infectious disease among corrections personnel and inmates.

Translation Goal 10.1.9: By 2014, recommend any needed changes to corrections facilities infection control programs to certifying bodies.

Intermediate Goal 10.2: Determine the frequencies and types of illnesses and injuries in non-medical corrections personnel from sharps exposures by 2012 through work with labor organizations, professional associations and federal, state and local government agencies.

Research Goal 10.2.1: By 2010, review Office of Justice data, and disability, compensation and other databases to determine overall frequencies and severity of sharps injuries and subsequent illnesses.

Research Goal 10.2.2: By 2012, identify causal factors such as search techniques and inmate contact for correctional personnel sharps injuries.

Research Goal 10.2.3: By 2012, evaluate effectiveness of policies and procedures for avoidance of sharps injuries including the barriers to worker acceptance.

Research Goal 10.2.4: By 2012, evaluate the psychological consequences of experiencing a

sharps injury among corrections personnel.

Research Goal 10.2.5: By 2013, evaluate the effectiveness of PPE and alternative search methods in reducing sharps injuries.

Translation Goal 10.2.6: By 2015, incorporate significant findings from this research into training programs and operational procedures at all corrections facilities.

Strategic Goal 11: Reduce occupational stressors in corrections personnel by 20% by 2015.

Intermediate Goal 11.1: Identify and reduce occupational stressors and associated health outcomes related to work factors by 2015 through work with labor organizations, professional associations and local, state and federal government agencies.

Research Goal 11.1.1: By 2012, systematically evaluate existing data sets for health outcomes that have been associated with occupational stressors in corrections personnel.

Research Goal 11.1.2: By 2012, evaluate the prevalence and effects of bullying and inadequate support (from supervisor and co-workers) among corrections personnel.

Research Goal 11.1.3: By 2012, investigate the impact of shift work and overtime on job fatigue and sleep disorders among corrections personnel.

Research Goal 11.1.4: By 2012, evaluate existing fatigue management and shift-work policies in other industries and government agencies for possible application to corrections personnel.

Research Goal 11.1.5: By 2012, identify frequency and severity of substance abuse, domestic violence, psychological problems, and attempted suicides among corrections personnel.

Research Goal 11.1.6: By 2015, identify possible adverse health effects such as cardiovascular diseases that may be due to the total mental and physical stressors among correctional personnel.

Translation Goal 11.1.7: By 2015, incorporate significant findings from this research into training programs and operational procedures at all corrections facilities.

Intermediate Goal 11.2: Identify and reduce occupational stressors related to the work culture and the physical work environment among corrections personnel by 2015 through work with labor organizations, professional associations and federal, state and local government agencies.

Research Goal 11.2.1: By 2012, evaluate the roles of building design, indoor air quality, and sanitation of the correctional environment in adverse health effects among corrections personnel.

Research Goal 11.2.2: By 2015, determine the influence of the prison correctional work culture, hierarchy of controls, and punitive discipline on adverse health effects among corrections personnel.

Intermediate Goal 11.3: Develop guidelines for worksite medical surveillance and wellness programs for correctional personnel through work with labor organizations, professional associations and federal, state and local government agencies by 2015.

Research Goal 11.3.1: By 2012, evaluate the effectiveness of existing worksite medical surveillance and wellness programs in reducing illnesses and injuries.

Research Goal 11.3.2: By 2014, identify the essential components of effective, facility-based wellness programs for corrections institutions.

Translation Goal 11.3.3: By 2015, improve existing worksite medical surveillance and wellness programs to reduce all illnesses and injuries including stress-related health effects.

EMERGENCY MEDICAL SERVICES

Emergency medical service personnel may be employed by hospitals, private ambulance services, or public agencies including fire departments. BLS estimates 201,000 emergency medical technicians (EMT) and paramedics were employed in these organizations in 2006. A much larger number of volunteers work in these professions and many fire fighters are trained as EMT and paramedics. Over the past four years, occupational fatalities among ambulance service employees have ranged from a low of 7 in 2003 to a high of 27 in 2004 according to the Census of Fatal Occupational Injuries. Nearly all of these fatalities were due to transportation incidents and, over 2004 to 2006, two-thirds were due to aircraft crashes. Among workers employed by private ambulance services, the leading injury event is overexertion with sprains and strains being the most common injury nature. EMTs are also exposed to biological, chemical, and physical agents. These exposures may result in increased risks for acute illnesses and chronic diseases such as cardiovascular disease, cancer and reproductive health disorders. Neither the exposures nor the illnesses of EMTs have been adequately evaluated.

Strategic Goal 12: Reduce traumatic injury and fatalities among EMS personnel associated with vehicle crashes by 15% by 2015.

Intermediate Goal 12.1: Create and promulgate training programs to ensure safe operations of all ground vehicles through management and labor organization partnerships by 2010.

Research Goal 12.1.1: By 2010, evaluate the effectiveness of EMS vehicle operation training programs and identify essential components.

Translation Goal 12.1.2: By 2010, implement requirements for EMS driver safety training programs to be provided at regular intervals.

Translation Goal 12.1.3: By 2010, create effective health communication products that promote seat belt use, passive seatbelt restraints, and appropriate head trauma protection.

Translation Goal 12.1.4: By 2010, evaluate the effectiveness of including compliance with safety measures into performance appraisals of EMS workers and supervisors.

Intermediate Goal 12.2: Improve the designs of all vehicle types used by EMS by 2012 to decrease the risks of traumatic injuries and fatalities that result from vehicle crashes through work with vehicle and equipment manufacturers, EMS agencies, and other stakeholders and partners.

Research Goal 12.2.1: By 2009, develop partnerships between EMS organizations, agencies and equipment manufacturers to identify available technologies that can reduce injury risks for EMS personnel during vehicle crashes.

Translation Goal 12.2.2: By 2009, evaluate emergent safety designs such as alternative restraint systems, in-vehicle communications, anticipatory navigational cueing, and signage through partnerships between EMS organizations, agencies and equipment manufacturers.

Translation Goal 12.2.3: By 2010, develop and disseminate guidelines for installation of injury prevention technology in ambulances including securing projectiles, patient and paramedic restraints, and noise reduction.

Translation Goal 12.2.4: By 2012, ensure that organizations that create consensus or regulatory standards that affect EMS equipment have reviewed and considered recent design changes or recommendations.

Intermediate Goal 12.3: Create and promulgate programs to ensure safe operations of all EMS aircraft through management and labor organization partnerships by 2010.

Translation Goal 12.3.1: By 2010, implement pilot safety training courses at regular intervals.

Translation Goal 12.3.2: By 2010, conduct educational campaigns and use health communication products to promote use of appropriate protective equipment in the aircraft.

Translation Goal 12.3.3: By 2010, incorporate compliance with all safety procedures and practices into performance appraisals of all air ambulance personnel and their supervisors.

Strategic Goal 13: Reduce traumatic injuries among EMS personnel that occur during movement of patients and equipment by 30% by 2012.

Intermediate Goal 13.1: Ensure that patient transfer methods and equipment technologies reduce traumatic injuries by 2012 through work with EMS professional associations and other stakeholders and partners.

Research Goal 13.1.1: By 2010, evaluate the effectiveness of training programs for assessment of possible patient behavioral issues, law enforcement assistance, and appropriate equipment selection.

Research Goal 13.1.2: By 2010, evaluate low friction, bariatric patient transfer and vertical lift and descent technologies and provide recommendations for further developments.

Translation Goal 13.1.3: By 2010, develop and disseminate clearly written guidelines to minimize injury risk during patient transfer and the use of appropriate equipment within the EMS system.

Dissemination Goal 13.1.4: By 2012, ensure that knowledge about advances in technologies and effective training techniques are delivered to EMS workers and supervisors and incorporated into accepted practice through EMS organizations, agencies and professional associations.

Strategic Goal 14: Reduce hazardous exposures to EMS personnel through effective design and use of PPE, and proper work practices by 25% by 2012.

Intermediate Goal 14.1: Ensure that sources of infectious disease are recognized and appropriate precautions taken by 2009 through work with EMS agencies and organizations, public health departments, government agencies and other stakeholders and partners.

Translation Goal 14.1.1: By 2009, develop clearly written guidelines on the provision, use, maintenance, and disposal of PPE and EMS uniforms.

Translation Goal 14.1.2: By 2009, develop clearly written guidelines on the proper use of chemicals and appropriate decontamination methods for equipment, vehicles, and PPE.

Translation Goal 14.1.3: By 2009, ensure the relevance and currency of training courses that address infection control, immunizations, and selection and use of appropriate PPE.

Intermediate Goal 14.2: Evaluate potential exposures of EMS personnel to physical and chemical agents and create best practice guidance to minimize possible health effects from the exposures by 2013.

Research Goal 14.2.1: By 2012, evaluate potential EMS exposures to cleaning agents, disinfectants, diesel and jet fuels, particulate matter, noise and other agents that are associated with emergency medical services tasks in response vehicles and assigned stations.

Translation Goal 14.2.2: By 2013, identify best practices to minimize exposures to potentially hazardous agents among EMS personnel and distribute them through professional associations, state agencies, local government officials and hospital associations.

Strategic Goal 15: Identify and implement effective policies among EMS agencies regarding work organization factors to reduce related illnesses and injuries by 2012.

Intermediate Goal 15.1: Develop effective guidelines to reduce worker fatigue and occupational stress through collaboration with labor, management and professional associations by 2012.

Research Goal 15.1.1: By 2012, identify the extent and severity of adverse health outcomes such as job fatigue and sleep disorders that may be associated with shift work, overtime, and other factors among EMS personnel.

Research Goal 15.1.2: By 2012, evaluate existing fatigue management and shift-work policies in other industries and government agencies for possible application to EMS.

Research Goal 15.1.3: By 2012, identify frequency and severity of substance abuse, domestic violence, psychological problems, and attempted suicides among EMS personnel.

Intermediate Goal 15.2: Develop guidelines for worksite medical surveillance and wellness programs for EMS personnel through work with labor organizations, professional associations and local government agencies by 2015.

Research Goal 15.2.1: By 2012, evaluate the effectiveness of existing worksite medical surveillance and wellness programs in reducing illnesses and injuries.

Research Goal 15.2.2: By 2010, identify effective strategies and develop programs that support EMS personnel who witness critical incidents (e.g., traumatic accidents, on-the-job death of coworker).

Research Goal 15.2.3: By 2014, identify the essential components of effective, facility-based wellness programs for EMS agencies and organizations.

Translation Goal 15.2.4: By 2015, improve existing worksite medical surveillance and wellness programs to reduce all illnesses and injuries including stress-related health effects.

Strategic Goal 16: Create an integrated occupational health and safety surveillance data system for Emergency Medical Service (EMS) personnel and evaluate risks for their exposures, illnesses, injuries and fatalities by 2013.

Intermediate Goal 16.1: Identify and evaluate existing databases that may be used for occupational safety and health surveillance for EMS personnel at the Bureau of Labor Statistics, National Highway Traffic Safety Administration, CDC/NIOSH and state EMS agencies.

Research Goal 16.1.1: By 2010, systematically collect occupational exposure, illness, injury and fatality data sets for EMS personnel from existing datasets within federal and state agencies and other organizations.

Research Goal 16.1.2: By 2011, determine the utility and limitations of individual or combined data sets to evaluate occupational safety and health risk for EMS personnel.

Intermediate Goal 16.2: Establish ongoing surveillance systems and evaluate trends, emerging issues and intervention needs for EMS through collaboration with Federal and State agencies and professional organizations.

Research Goal 16.2.1: By 2011, establish methods and responsibilities and develop collaborative agreements with key partners for the ongoing collection and analysis of integrated EMS surveillance data sets.

Research Goal 16.2.2: By 2013, evaluate trends, emerging issues and intervention needs for EMS exposures, illnesses, injuries, and fatalities, and publish results in peer-reviewed journal articles.

Translation Goal 16.2.3: By 2014, produce articles for EMS personnel, supervisors and managers about risks for exposures, illnesses, injuries and fatalities with guidance on ways to reduce the risks and disseminate this information through trade publications.