

National Occupational Research Agenda (NORA)
National Total Worker Health[®] Agenda (2016–2026)

A National Agenda to Advance Total Worker Health[®] Research, Practice, Policy, and Capacity

April 2016

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



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NATIONAL TOTAL WORKER HEALTH® AGENDA (2016–2026)

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Total Worker Health® Research,
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Executive Summary

The purpose of the National Total Worker Health Agenda is to define and prioritize occupational safety and health research, practice, and prevention activities in Total Worker Health for the Nation (2016–2026). NIOSH defines Total Worker Health as policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being. The National Total Worker Health Agenda's strategic goals are broadly organized into four categories: 1) Research, 2) Practice, 3) Policy, and 4) Capacity-Building. Intermediate and activity/output goals are included for each.

Abbreviations

HHS	U.S. Department of Health and Human Services
NIOSH	National Institute for Occupational Safety and Health
NORA	National Occupational Research Agenda
OSH	Occupational Safety and Health
TWH	Total Worker Health®
NIH	National Institutes of Health
IOM	Institute of Medicine

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Introduction

History of Total Worker Health

In 2003, the National Institute for Occupational Safety and Health (NIOSH) started the Steps to a Healthier U.S. Workforce Initiative to explore the benefits of integrating the protection of workers from work-related safety and health hazards with efforts to promote health and prevent disease. One of the important outcomes of this initiative was the 2004 Steps to a Healthier U.S. Workforce Symposium that received overwhelming support from the stakeholder community [Schill and Chosewood 2013]. Building on this enthusiastic support, the “Steps” Initiative developed into the Work-Life Initiative and a second highly successful symposium was convened in 2007.

During these foundational years, NIOSH primarily focused on funding extramural research Centers of Excellence to Promote a Healthier Workforce (Centers of Excellence) to complement intramural efforts. In 2006 and 2007, NIOSH funded three Centers: the University of Iowa Healthier Workforce Center of Excellence (University of Iowa), the Center for the Promotion of Health in the New England Workplace (University of Massachusetts Lowell and University of Connecticut), and the Harvard T.H. Chan School of Public Health’s Center for Work, Health, and Well-Being (Harvard University), formerly the Harvard School of Public Health’s Center for Work, Health, and Well-Being. In 2011, a fourth Center was funded: Oregon Healthy Workforce Center (Oregon Health and Science University), formerly Oregon Health & Science University’s Center for Research on Occupational and Environmental Toxicology.

Also in 2011, NIOSH renamed its efforts focused on integration of occupational safety and health protection and health promotion from WorkLife to the Total Worker Health® Program. In addition to continuing support for the extramural Centers of Excellence, NIOSH committed to further developing its Total Worker Health (TWH) intramural research program. In 2014, NIOSH created the Office for Total Worker Health Coordination and Research Support (TWH Office) to coordinate and advance these extramural and intramural efforts and, in 2015, the U.S. Patent and Trademark Office granted the phrase “Total Worker Health” as an official registered trademark of the U.S. Department of Health and Human Services.

While development of the NIOSH TWH Office is recent, there has been long-standing interest in integrated worksite health protection and health promotion programs in the scientific community [Sauter 2013]. For example, more than 20 years ago, DeJoy and colleagues [McLeroy et al. 1988, DeJoy and Southern 1993] argued for taking an ecological or systems approach to occupational safety and health—one that would recognize that worker injury and illness have myriad causes and, therefore, require coordinated interventions that take into account individual as well as occupational risk factors.

Total Worker Health Defined

In September 2014, a draft version of the National Total Worker Health Agenda (Proposed National Total Worker Health Agenda) was published for stakeholder input (for additional details on input received, please refer to the “National Total Worker Health Agenda” sub-section). Originally, in the Proposed National Total Worker Health Agenda, TWH was defined as a strategy integrating occupational safety and health protection with health promotion to prevent worker injury and illness and to advance safety, health, and well-being. In 2015, in response to stakeholder input received, the TWH definition was expanded and the TWH approach was more finely focused. The refined description better reflects the priorities of the program and helps to overcome the equating of TWH with traditional workplace wellness programs that fail to integrate worker protection elements. TWH continues to place priority upon a hazard-free work environment that protects the safety and health of all workers. In conjunction, it recommends the integration of all organizational policies, programs and practices that contribute to worker safety, health and well-being. Accordingly, NIOSH now defines TWH as policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

Rationale for Total Worker Health

The most recent statistics available reveal that, in 2014, a total of 4,679 U.S. workers died from work-related injuries [BLS 2015a]; and in 2007, 53,445 deaths could be attributed to work-related illness [Leigh 2011]. In 2014, roughly 3 million injuries and illnesses to private industry workers and 722,000 to state and local government workers were reported by employers [BLS 2015b]. In 2007, the cost of work-related fatalities, injuries, and illnesses in the United States was estimated at \$250 billion [Leigh 2011]. Beyond the economic impact of these adverse safety and health outcomes is the pain and suffering faced by workers, their families, businesses and communities.

Systemic changes to our economy and socio-demographic workforce factors are rendering some past approaches to protecting workers ineffective. Increasingly, employers face tighter profit margins, demanding timelines and global completion. Workers and employers must navigate new types of work arrangements, the aging of the workforce, high levels of work-related stress, and the growing challenges of both work and home life. Many enterprises continue to confront the legacy hazards of the traditional workplace, such as traumatic injury, chemical exposures, and shift work. At the same time, scientific evidence now supports what many safety and health professionals, as well as workers themselves, have long suspected—that risk factors in the workplace can contribute to common health problems previously considered unrelated to work.

TWH promotes the integration of occupational safety and health (OSH) protection with workplace policies, programs, and practices to prevent injury and illness and advance overall health and well-being through research, interventions, partnerships, and capacity-building to meet the needs of the 21st century workforce. The rationale for this approach was first presented in three NIOSH-commissioned white papers at the 2004 Steps Symposium. These white papers were updated and published by NIOSH as a Research Compendium in 2012 [NIOSH 2012]. As illustrated in the Compendium, a small body of evidence suggested that integrating occupational safety and health protection program activities with health promotion program activities may be more effective for safeguarding worker safety, health, and well-being than either of these programmatic activities on their own.

Issues Relevant to Advancing Worker Well-being through Total Worker Health

There is a broad spectrum of issues relevant to advancing the safety, health and well-being of workers through TWH. As illustrated in Figure 1, this list of issues (updated November 2015) incorporates input from varied stakeholders and a more targeted focus of TWH. Pertinent to the 21st century worker and workplace*, this list reflects working conditions, emerging forms of employment, and changing workforce demographics that may present both legacy and emerging risks to worker health. Understanding and reducing these risks is fundamental for advancing TWH efforts.

Figure 1 displays the issues relevant to TWH which can be categorized as follows: control of hazards and exposures; organization of work; built environment supports; leadership; compensation and benefits; community supports; changing workforce demographics; policy issues and new employment patterns.

Control of hazards and exposures relates to both persistent and new challenges, ranging from traditional chemical, physical, and biological agents to contemporary exposures associated with psychosocial and human factors. Prevention of injuries, illness, and fatalities and promotion of safe and healthy work through risk assessment and risk management efforts are fundamental to protecting workers in the workplace.

Organization of work refers to the processes associated with job structure and the organizational practices that influence job design and human resource policies; examples include safe staffing, healthier shift work, and flexible work arrangements.

*For the purposes of this National Total Worker Health Agenda, the word “workplace” refers to any location where a worker conducts work for an employer. In this sense, “workplace” could be an office building, a construction site, a motor vehicle, a truck, a mine, or even the worker’s home.

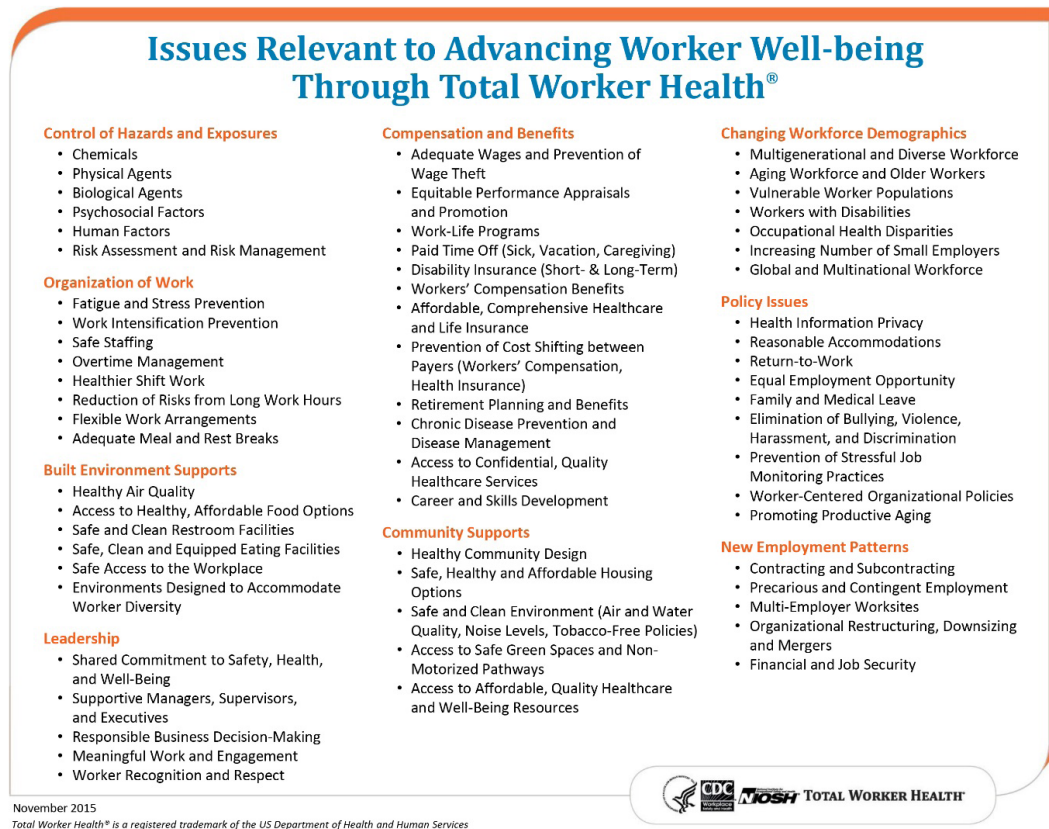


Figure 1. Issues Relevant to Advancing Worker Well-being through Total Worker Health

Such efforts seek to prevent work-related fatigue and stress and adverse health outcomes from stress-related disorders.

For built environment supports, provisions and conditions that promote safe and healthy places and spaces where people work are pertinent. They also include a supportive infrastructure, such as safe access to work, spaces designed to accommodate workers of varying abilities, as well as access to affordable and healthy food options.

Those in leadership positions set the vision, mission, tone, and climate of an organization and, in doing so, have an opportunity to advance worker well-being. Attention to improving how workers are supervised, directed, and evaluated in their daily work and optimizing the environments under which workplace demands are crafted is critical to a TWH approach. Supporting workers through provision of meaningful work that produces and maintains engagement advances worker well-being.

Compensation and benefits, such as paid-time off for sick or caregiving-related leave, or vacation, are important from a TWH perspective. Additional issues include access to workers' compensation, healthcare coverage, and retirement benefits, all of which are threatened by rising health care costs and shifts away from employer-offered programs and services.

Community supports reflect the need for better management of the interface between work and life. TWH considers the needs of workers and family in the context of their community. Designing healthy and accessible communities with safe, affordable housing and environments is key for advancing worker and family well-being, on and off the job.

Changing workforce demographics and diversity within the modern workplace are increasingly apparent. By 2020, one in four American workers will be over the age of 55 [BLS 2012]. Older workers are especially concerned with aging productively, their ability to remain in the workforce as long as they wish, and preparing for a healthier retirement. Other groups of workers who face unique challenges include those with higher health risks, such as those who are low-income, veterans who are transitioning from military to civilian careers, workers with disabilities, and young workers. Shifts in population demographics and the multigenerational nature of the workforce also creates new challenges. TWH tenets encourage employers to protect and advance the health and well-being of their existing workers.

Policies that are supportive of TWH principles address health information privacy, paid family and medical leave, elimination of bullying, violence, harassment and discrimination, and return-to-work policies after injury or illness.

TWH is concerned with the entire working life of individuals. New employment patterns have created dramatic changes in the conditions of work across the lifespan and there has been a wide-spread transformation of the employment relationship between workers and employers due to economic, societal, and organizational pressures. New employment patterns such as repeated periods of involuntary unemployment resulting from precarious or contingent work, for example, have implications for worker safety, health, and well-being. A worker's job tenure is often uncertain, which may have significant health effects that carry over to other jobs [Sirvio et al. 2012]. Additionally, during a working lifetime, the average U.S. worker holds more than 11 jobs, some separated by periods of unemployment [BLS 2015c]. Further, though there are roughly 150 million individuals over age 16 in the workforce, there are about 92 million more who do not participate in the workforce [BLS 2015c]. While some are retired, many more have simply stopped, temporarily or permanently, seeking employment.

The Vision for Total Worker Health

Through investments in research and the transfer of this research into practice, the long-term vision of TWH is to protect the safety and health of workers and to advance their well-being by creating safer and healthier work environments, and addressing employment-related issues. It is anticipated that this vision will be achieved through knowledge generation, translation of that knowledge into practice, development of policy guidance, and building workforce capacity. Creation of a National Total Worker Health Agenda (Agenda) is an important step toward making this vision a reality.

National Occupational Research Agenda

The National Occupational Research Agenda

The National Occupational Research Agenda (NORA) is a partnership forum to stimulate innovative research and enhance workplace practices. For almost 20 years, NORA has been the occupational safety and health research framework for NIOSH and the Nation. Stakeholders with diverse interests collaborate to identify the most critical issues in workplace safety and health. Participation in NORA is broad-based and includes stakeholders from academia, worker organizations, professional societies, private industry, and government agencies. For more information about NORA, see: <http://www.cdc.gov/niosh/nora/default.html>.

The National Total Worker Health Agenda

This is the first time a TWH-specific NORA has been created. The intention is to create an Agenda that will galvanize researchers, occupational safety and health practitioners, health promotion and wellness professionals, workers, employers, labor organizations, health care providers, educators, policymakers and other stakeholders to simultaneously protect workers from hazards in the workplace and to advance the well-being of the workforce. Success of this effort will be dependent on a shared nationwide commitment to the TWH approach.

Broad stakeholder participation is one of the hallmarks of the NORA process. By offering a draft Agenda for stakeholder review and comment, NIOSH continued this NORA tradition. On September 23, 2014, NIOSH announced in the Federal Register [79 Fed. Reg. No. 184 (2014); 56804-56805] the availability of the Proposed National Total Worker Health Agenda for stakeholder review. Stakeholders were invited to provide input on the top priority issues to include in the Agenda by mail, through <http://www.regulations.gov>, and/or in-person at one of three conference town-hall sessions during the following two scientific meetings held October 6-10, 2014: The 1st International Symposium to Advance Total Worker Health and The Healthier Federal Workers Conference. During the 90-day review period that closed on December 22, 2014, 42 submissions from stakeholders were received by the NIOSH Docket Office for the Agenda, NIOSH Docket #275. To review the NIOSH Response to Stakeholders' Summarized Comments, please visit <http://www.regulations.gov>. Stakeholders provided a wealth of insightful comments that greatly helped to shape and add goals for this final Agenda.

Goals for the Nation

The Agenda includes four strategic goals, grouped into the following domains: Research, Practice, Policy, and Capacity-Building. These domains are not mutually exclusive and each is vital to advance TWH. Achievement of these goals will move the Nation towards creation of work and work environments that support the overall safety, health, and well-being of workers.

According to the goal hierarchy employed for this Agenda, strategic goals represent change at the social system-level. In turn, each strategic goal is supported by intermediate and activity/output goals designed to achieve the strategic goal. Intermediate-level goals use the products and outcomes produced at the activity/output goal level. Successful accomplishment of these goals will be dependent upon a transdisciplinary approach with stakeholders across many sectors, including academic researchers, occupational safety and health practitioners, health promotion and wellness professionals, workers, employers, labor organizations, health care providers, educators, policymakers and others.

The goals in this Agenda are based on the more urgent needs in the emerging field of TWH. While not all issues listed in Figure 1 are singled out in the goals, each is considered relevant to advancing worker well-being through TWH. The Agenda goals are derived from a number of sources in the peer-reviewed, published literature [Cherniack et al. 2010, Hymel et al. 2011, Sorensen et al. 2011, NIOSH 2012, Schill and Chosewood 2013], stakeholder comments received in response to the draft Agenda (previously described), and two TWH workshops, all of which contributed to expanding the TWH definition, approach, and Agenda.

The first workshop that provided input for the Agenda was convened by the Institute of Medicine (IOM) in 2014 and sponsored by NIOSH. The objective of the workshop was to identify promising practices, barriers, and measures associated with the design, implementation, and evaluation of an integrated approach to worker health. Details about this workshop, Total Worker Health™: Promising and Best Practices in the Integration of Occupational Safety and Health Protection with Health Promotion in the Workplace – A Workshop [National Academies of Sciences, Engineering, and Medicine 2014], can be found at <http://www.iom.edu/Activities/Environment/TotalWorkerHealth/2014-MAY-22.aspx>.

The second workshop that influenced the Agenda was co-sponsored by NIOSH, the National Institutes of Health (NIH) Office of Disease Prevention, and the National Heart, Lung, and Blood Institute and convened in late 2015. During the workshop, invited experts discussed the evidence and research gaps and attendees provided public comments. Based on the presentations and discussions, an unbiased, independent panel drafted a report outlining research gaps and future research priorities. The panel's preliminary recommendations include: 1) convene a meeting

of stakeholders to set research priorities for integrated interventions; 2) develop a consensus-based conceptual framework to guide future intervention research; 3) develop a core set of measures and outcomes that are incorporated into all integrated intervention studies; 4) use a transdisciplinary and participatory process for intervention development; 5) ensure that future intervention studies represent an appropriate range of worker populations and settings; 6) expand research and evaluation design options to include a range of rigorous methodologies; 7) develop effective strategies for timely dissemination of findings to a wide variety of stakeholders; 8) make investments in research infrastructure and assets to develop population-based laboratories for TWH research. Details about this Pathways to Prevention workshop, *Total Worker Health: What's Work Got to Do With It?* [NIH 2015] can be found at <https://prevention.nih.gov/programs-events/pathways-to-prevention/recent-workshop/total-worker-health>.

Synthesizing all available input, four strategic goals were developed to better safeguard the safety, health, and well-being of workers, support overall workforce vitality, and foster national economic prosperity. These goals are:

1. **Research:** Advance and conduct etiologic, surveillance, and intervention research that builds the evidence base for effectively integrating protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.
2. **Practice:** Increase the implementation of evidence-based programs and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.
3. **Policy:** Increase adoption of policies that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.
4. **Capacity-Building:** Build capacity to strengthen the TWH workforce and TWH field to support the development, growth, and maintenance of policies, programs and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

Research

Strategic Goal 1. Advance and conduct etiologic, surveillance, and intervention research that builds the evidence base for effectively integrating protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

- **Intermediate Goal 1.1:** Use research findings from transdisciplinary and participatory process studies investigating work and non-work factors that contribute

to worker safety, health, and well-being to better understand their sources and identify potential TWH workplace interventions.

- **Activity/Output Goal 1.1.1:** Improve surveillance systems to expand study of risks to worker safety, health, and well-being by incorporating more information on:
 - work-related exposures in public health surveys and other surveillance systems; and
 - non-work conditions and exposures in occupational safety and health hazard surveys and other surveillance systems.
- **Activity/Output Goal 1.1.2:** Complete studies to understand the impact of new employment patterns, to include contingent work and low wage workers, on worker safety, health, and well-being.
- **Activity/Output Goal 1.1.3:** Describe the theoretical underpinnings of potential TWH interventions to better understand why and under what circumstances they are effective.
- **Activity/Output Goal 1.1.4:** Complete studies to understand the construct of organizational commitment to safety, health, and well-being – how it is achieved and assessed, effects on worker health and mediating effects (e.g., pro-health interventions in the workplace).
- **Activity/Output Goal 1.1.5:** Study TWH interventions to target workers at high-risk for exposure to both work-related and non-work hazards that impact safety and health in the workplace.
- **Activity/Output Goal 1.1.6:** Study TWH interventions for especially prevalent, high-burden, and/or costly conditions (e.g., mental health outcomes, comorbid conditions) that result from joint exposure to work-related and non-work hazards.
- **Activity/Output Goal 1.1.7:** Study characteristics of workers' compensation programs and how they integrate with other workplace policies, programs, and practices to improve how injured/ill workers receive care and are reintegrated back into the workforce.
- **Activity/Output Goal 1.1.8:** Assess research needs and gaps by periodically engaging stakeholders and the scientific community.
- **Intermediate Goal 1.2:** Incorporate research findings from studies investigating the merits of policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

- **Activity/Output Goal 1.2.1:** Assess how to integrate well-being promotion activities with occupational safety and health management systems most effectively.
- **Activity/Output Goal 1.2.2:** Evaluate how management practices, including work organization and job design, and communication and decision making practices, influence worker safety and health outcomes (to include work-life/work-family outcomes) and point to opportunities for prevention.
- **Activity/Output Goal 1.2.3:** Examine subclinical markers (e.g., biomarkers), health status (morbidity and mortality), and health-related quality of life indicators of illness, injury, and well-being to better understand the efficacy and effectiveness of integrated intervention strategies.
- **Activity/Output Goal 1.2.4:** Evaluate the impact of supervisors, middle managers, and upper leadership in the success of TWH programs.
- **Activity/Output Goal 1.2.5:** Assess how organizational policies and practices support or detract from the adoption, development, effectiveness, efficacy, and sustainability of TWH programs.
- **Activity/Output Goal 1.2.6:** Investigate the effects of broader integration of:
 - workplace prevention activities (i.e., benefit programs and policies, Employee Assistance Programs, disability management) together with occupational safety and health activities;
 - community and public health prevention activities together with workplace prevention activities; and
 - hierarchy of controls with other workplace health interventions.
- **Activity/Output Goal 1.2.7:** Identify fundamental components of integrated programs with positive outcomes to enable generalizability to other organizations of diverse industries and geography.
- **Intermediate Goal 1.3:** Apply rigorous, standardized methods for studying TWH interventions.
 - **Activity/Output Goal 1.3.1:** Develop a standardized approach for measuring well-being.
 - **Activity/Output Goal 1.3.2:** Develop a core set of measures and outcomes that can be incorporated into all studies of integrated interventions.
 - **Activity/Output Goal 1.3.3:** Develop standardized and rigorous measures of organizational effectiveness of TWH interventions (e.g., turnover, presenteeism, worker morale, organizational reputation, and other performance indicators).

- **Activity/Output Goal 1.3.4:** Develop standardized and rigorous economic indicators to better understand the cost-effectiveness of TWH programs and help establish the business case[†] for integrated prevention strategies.
- **Activity/Output Goal 1.3.5:** Create measures to guide consistency of implementation and study of integrated interventions in organizations, such as integrated safety, health, and well-being risk appraisals or other tools that reliably capture both work-related and non-work exposures that pose safety and health risks in the workplace.
- **Activity/Output Goal 1.3.6:** Publish TWH studies that specify detailed methodological approaches, including measures, so others may replicate studies and/or better understand limitations.
- **Intermediate Goal 1.4:** Assist in tracking adoption and reach of TWH interventions over time.
 - **Activity/Output Goal 1.4.1:** Expand current surveillance systems or develop new ones to track the adoption and reach of TWH interventions.
 - **Activity/Output Goal 1.4.2:** Evaluate whether/how healthy non-punitive competition between workplaces can help foster uptake of TWH programs.

Practice

Strategic Goal 2. Increase the implementation of evidence-based programs and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

- **Intermediate Goal 2.1:** Apply TWH best practices developed from evidence-based research and consensus statements that promote worker safety, health, and well-being.
 - **Activity/Output Goal 2.1.1:** Determine effective practices leading to successful integration of worker safety and health protection with activities that advance the overall well-being (inclusive of work-life and work-family) of diverse worker populations in the full spectrum of work sectors.

[†]NIOSH considers the “business case for prevention” to be an economic evaluation from the employer’s perspective that demonstrates improvements in productivity, profitability, or sustainability through the implementation of policies, practices, or technologies that prevent worker injury and illness. Economic evaluations identify, measure, value, and compare the costs and benefits of different interventions, in order to effectively allocate resources. For employers, correctly identifying how their “bottom line” is impacted by their current and potential future activities, including worker injury and illness prevention activities, is at the core of successful businesses.

- **Activity/Output Goal 2.1.2:** Translate new research findings and concepts to applications, practices or technologies that can be utilized and evaluated in a variety of work settings.
- **Activity/Output Goal 2.1.3:** Establish partnerships with labor, employer, government, professional, and academic organizations to improve the implementation of TWH best practices in the workplace.
- **Activity/Output Goal 2.1.4:** Develop toolkits, guidelines, assessments, and other resources that address both health protection and worker well-being for practitioner use.
- **Activity/Output Goal 2.1.5:** Establish mechanisms for TWH-implementation-related communications and partnership-building, fostering management buy-in, and communication between management and workers.
- **Activity/Output Goal 2.1.6:** Perform feasibility studies of implementing TWH best practices.
- **Activity/Output Goal 2.1.7:** Conduct studies to evaluate the effects of TWH best practices implementation among organizations.
- **Activity/Output Goal 2.1.8:** Conduct a national survey to assess the adoption of TWH practices and use results to refine dissemination, implementation, and promotion activities.
- **Intermediate Goal 2.2:** Disseminate information about TWH best practices and benefits among workers, employers, professional associations, and others.
 - **Activity/Output Goal 2.2.1:** Organize international, national, and regional conferences, distance-learning events, and other web-based educational offerings to identify and disseminate TWH research and practice models.
 - **Activity/Output Goal 2.2.2:** Develop an internet-based, open source system for disseminating TWH best practices recommendations, tool kits, mobile apps, and model programs.
 - **Activity/Output Goal 2.2.3:** Establish partnerships with labor, employer, government, professional, and academic organizations to disseminate concept, knowledge gained from research, and important components of TWH.
 - **Activity/Output Goal 2.2.4:** Organize and provide a support network for the implementation of TWH practices.
 - **Activity/Output Goal 2.2.5:** Publish TWH evidence regularly in peer-reviewed journals and other open-source resources and materials to a wide variety of stakeholders.

- **Intermediate Goal 2.3:** Adopt recommendations of best TWH business case practices.
 - **Activity/Output Goal 2.3.1:** Identify and develop methods to analyze the potential benefits and costs of implementing TWH practices.
 - **Activity/Output Goal 2.3.2:** Perform analyses to assess the total benefits and costs of implementing TWH practices.
 - **Activity/Output Goal 2.3.3:** Identify elements of the business case that are most effective to encourage adoption of TWH best practices and models.

Policy

Strategic Goal 3. Increase adoption of policies that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

- **Intermediate Goal 3.1:** Implement policy guidance developed from evidence-based research and consensus statements to promote worker safety, health, and well-being.
 - **Activity/Output Goal 3.1.1:** Develop policy guidance and/or consensus statements on TWH best practices.
 - **Activity/Output Goal 3.1.2:** Establish mechanisms to promote responsible organizational policies, promoting TWH and sustainability of workers.
 - **Activity/Output Goal 3.1.3:** Develop recommendations on TWH approaches specifically for high-risk worksites and small- and medium-sized companies.
 - **Activity/Output Goal 3.1.4:** Develop and promote policies that support productive aging across the workforce.
 - **Activity/Output Goal 3.1.5:** Organize and provide a support network for the implementation of TWH policies.
- **Intermediate Goal 3.2:** Implement TWH recommendations that promote joint efforts between employers and workers to integrate occupational safety and health protection program activities with workplace policies, programs, and practices.
 - **Activity/Output Goal 3.2.1:** Build capacity for workplace improvement at all levels by enhancing policy initiatives that promote TWH.
 - **Activity/Output Goal 3.2.2:** Explore strategies to incorporate TWH programs and activities within the general health care delivery system, including insurance, risk management, and workers' compensations systems.

- **Activity/Output Goal 3.2.3:** Perform evaluation studies examining adoption of collaborative TWH policies, focusing on the organizational level.

Capacity-Building

Strategic Goal 4. Build capacity to strengthen the TWH workforce and TWH field to support the development, growth, and maintenance of policies, programs and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being.

- **Intermediate Goal 4.1:** Develop educational and training programs and products to expand capacity (knowledge, skills and abilities) for integrating TWH policies, programs, and practices in the workplace.
 - **Activity/Output Goal 4.1.1:** Survey key stakeholders to identify TWH training needs for existing and future workplace and allied professionals (i.e., occupational safety and health, worksite health promotion, human resources, business, academic, policy and other occupational and health professionals).
 - **Activity/Output Goal 4.1.2:** Identify existing educational programs and curricula where TWH education is currently offered and where TWH principles can be incorporated.
 - **Activity/Output Goal 4.1.3:** Assess the need for creating specialized TWH degrees, certificates, and continuing education programs.
 - **Activity/Output Goal 4.1.4:** Develop standard TWH core competencies to be used across programs.
 - **Activity/Output Goal 4.1.5:** Develop guidance in consultation with educators, academic professional societies and organizations for incorporating TWH core competencies into the curricula of existing and new degree, certificate, and continuing education programs.
 - **Activity/Output Goal 4.1.6:** Offer TWH seminars, workshops, and courses for undergraduate and graduate students, across various disciplines, such as Occupational Health, Public Health, Health Promotion, Health Sciences, Psychology and other Social Sciences, Business, Human Relations, and Engineering.
 - **Activity/Output Goal 4.1.7:** Evaluate mechanisms by which federal, state, and local agencies can support and fund TWH educational activities.
 - **Activity/Output Goal 4.1.8:** Publish accessible works in theory, research, and practice on integrative prevention strategies for worker safety, health, and well-being to train both existing and new TWH professionals.

- **Intermediate Goal 4.2:** Develop partnerships and collaborations to create the infrastructure and environment for expanding the organizational capacity to adopt TWH policies, programs, and practices in the workplace.
 - **Activity/Output Goal 4.2.1:** Promote collaborations and foster partnerships among stakeholders across disciplines to strengthen the TWH field.
 - **Activity/Output Goal 4.2.2:** Collaborate with CDC-funded worksite programs (e.g., the National Healthy Worksite Program, the Worksite Health Research Network, and the Work@Health Program) and with governmental and non-governmental agencies (e.g., state health departments, NIH, OSHA and others) on TWH efforts.
 - **Activity/Output Goal 4.2.3:** Create a TWH professional organization or align with an existing professional organization to develop standards, accreditation, and evaluation guidelines for TWH professionals to enhance their development and build capacity.
 - **Activity/Output Goal 4.2.4:** Develop materials and resources to increase knowledge, skills, and abilities, and promote dissemination, outreach, and adoption of TWH approaches through networks, online resources, toolkits and training manuals.
 - **Activity/Output Goal 4.2.5:** Establish an online inventory of existing national, state, and regional networks and resources that aim to build capacity and support for TWH principles and practices.
 - **Activity/Output Goal 4.2.6:** Convene scientific conferences and meetings to foster networking and collaboration, and identify current TWH needs with national and international stakeholders.

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Appendix A

NIOSH Contributors to the National Total Worker Health Agenda

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