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The NIOSH *Total Worker Health*[®] Vision

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You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.

—RICHARD BUCKMINSTER FULLER

The *Total Worker Health*[®] approach to safety, health, and well-being has attracted wide interest over the past 15 years. Not only is it intuitively appealing to a large portion of the National Institute for Occupational Safety and Health (NIOSH) stakeholder community, it has drawn stakeholders new to NIOSH, introducing them to extensive occupational safety and health (OSH) resources. The *Total Worker Health* (TWH) program has funded novel research and outreach efforts, forged dozens of new partnerships, and changed the focus of many workplace health programs in the private and public sectors. Yet, at times, the concept is applied in ways that are inconsistent with the NIOSH vision of the TWH program, creating uncertainty for some about what the TWH approach is and what it is not. This chapter presents an insiders' perspective on the TWH concept, including the formation of the original vision, the evolution and expansion of the vision, and the future vision. It provides information needed for a fundamental understanding of the TWH concept.

This chapter was authored by employees of the United States government as part of their official duty and is considered to be in the public domain. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention.

<http://dx.doi.org/10.1037/0000149-003>

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FORMATION OF THE VISION

The NIOSH experience of well-meaning efforts to improve the health of the U.S. adult population is that little, if any, attention is paid to the fact that working people spend the greater part of their waking hours during each 24-hour cycle at work and a large part of most days each week at work. Over the years, NIOSH has also observed an overall lack of appreciation of the evidence that work can adversely affect a worker's general health. Such was the design of *Steps to a HealthierUS (Steps)*, an initiative created by former U.S. Department of Health and Human Services (DHHS) secretary Tommy G. Thompson in 2003 to improve the health of the U.S. population (U.S. DHHS, 2004). Work as a contributor to people's health was forgotten largely because population health experts often lack the knowledge and skills to (a) recognize how working conditions contribute to creating a health hazard and (b) develop mitigation and prevention strategies to address those hazards. In addition, there has been a shortage of surveillance and research linking working conditions to population health outcomes, especially chronic disease outcomes.

Because OSH, including mandates by the Occupational Safety and Health Act of 1970, is such a niche area of public health, it is not surprising that efforts to promote population health often fail to recognize work as a contributor to general health outcomes. The Steps initiative provided a stimulus and an opportunity for NIOSH to contribute to its success by launching a complementary spin-off, *Steps to a HealthierUS Workforce* (NIOSH, 2004). The NIOSH initiative augmented the DHHS Steps initiative by adding specialized content about the ways that working conditions can adversely affect general health outcomes and ways to mitigate these effects. The goal of *Steps to a HealthierUS Workforce* was "to protect, support, and enhance the health of workers through comprehensive programs for safe and healthy work, integrated with health-supportive environments and access to adequate health care" (NIOSH, 2015d, para. 1).

Simultaneously, these developments provided an opportunity for reflection on why the OSH community was commonly forgotten in large population-based initiatives such as Steps. Perhaps the "fault" rested with the OSH community because its practitioners held an implicit understanding about the existence of a sharp division between what happened at work (occupational) and what workers experience outside the workplace (nonoccupational). This belief may have been grounded in experience with the state and federal workers' compensation laws that necessitate the evaluation of injury and illness as either "work related" or "not work related." This bright-line division does not allow for the integration of personal choices, lifestyle, after-work activities, or other individual factors, with working conditions to produce an integrated approach to worker health. Driven by workers' compensation laws, the administrative division between occupational and nonoccupational injury and illness tended to permeate all safety and health approaches to worker safety and health. This bifurcated approach became an obstacle to a population health approach to worker safety and health. NIOSH recognized this and sought to expand the world of "work-related" injury and illness to the broader world of "worker"

injury and illness. Moreover, NIOSH observed that the strong and constant emphasis on the technical aspects of industrial hygiene and safety engineering ceded the field of worker health to health promotionists, who primarily used the worksite as a platform to promote individual behavior change, even if conditions at the worksite were unsafe and unhealthy. Even when the work environment was considered, the focus tended to be on amenities like fitness facilities, cafeterias, and vending machines, and not on working conditions.

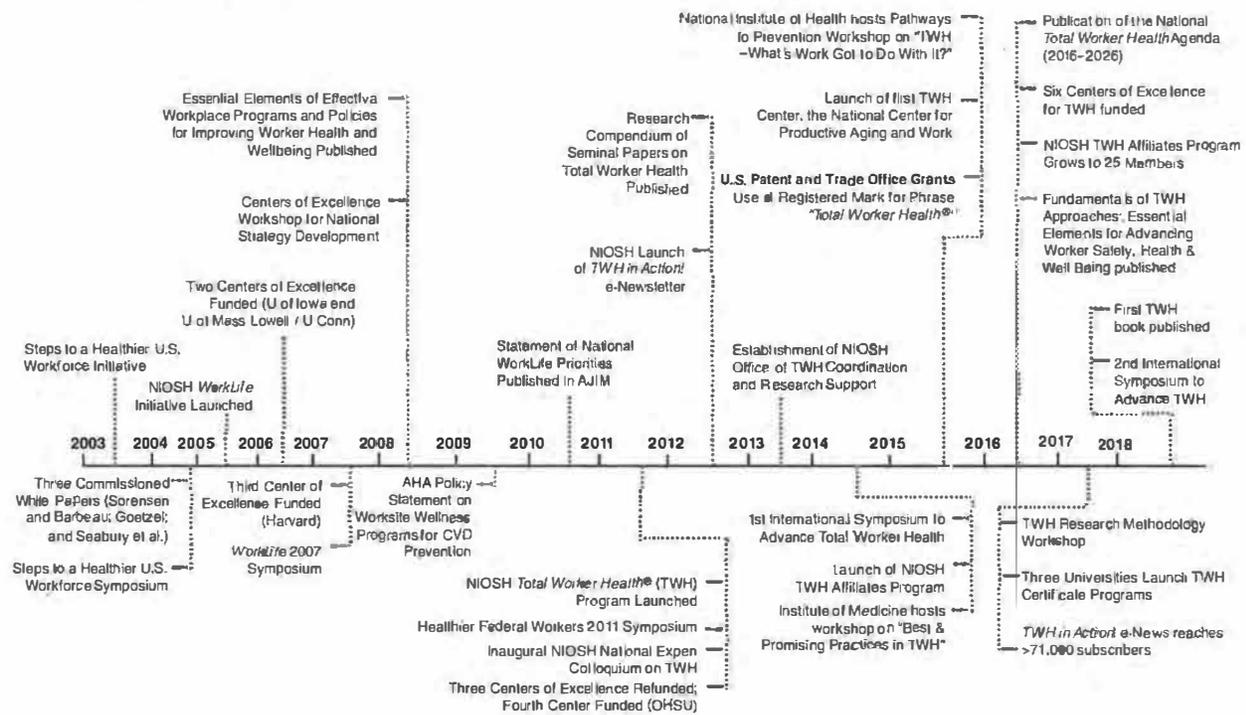
The NIOSH *Steps to a Healthier US Workforce* initiative provided a framework to enlarge the scope of practice for OSH practitioners. It was anticipated that this enlargement would (a) expand the scope of practice for the OSH profession, (b) better serve the worker and the employer, and (c) reveal the shortcomings of efforts that focused solely on worksite wellness and health promotion. The latter has often been an incomplete strategy that ignores the interaction of workers with the work environment and uses workers as a captive audience for health appraisals and disease management efforts by employers often guided by their interest in lowering skyrocketing employer-sponsored health care costs.

In 2005, the DHHS *Steps* initiative faded and the name of the NIOSH initiative was changed to the *WorkLife Initiative*. Focusing the program in this way acknowledged the intersection of work and life outside of work as a growing concern of workers and was responsive to stakeholder calls for NIOSH to continue its leadership in promoting research, policy, and practice in the areas of science, economics, and coordination of health protection and health promotion to improve the health of workers (NIOSH, 2015d). During these early years, the WorkLife Initiative continued efforts to address worker safety, health, and well-being in a more comprehensive way by considering both the work environment and general health-related decisions and behaviors of workers. In addition to supporting research, adoption of health-enhancing policies and practices, and transdisciplinary collaboration, the WorkLife Initiative endeavored to bridge the long-standing separation and, often, competition between the OSH and health promotion professional communities. From 2005 to 2010, funding for this NIOSH programmatic area was primarily extramural through NIOSH Centers of Excellence for *Total Worker Health*[®] (Centers: see Figure 2.1). In 2008, representatives of these Centers began to develop a long-range strategy for advancing the WorkLife Initiative. Their research, policy, and practice recommendations were released in 2011 (Cherniack et al., 2011).

By 2011, the vision to integrate health protection and health promotion to advance worker well-being and find common ground with the worksite health promotion community began to crystallize. To reflect the progression of programmatic development, NIOSH renamed its efforts the TWH program to emphasize a more holistic view of the health of workers. This name resonated more clearly with the stakeholder community. At this juncture, NIOSH broadened its commitment by developing an intramural research program and increasing efforts focused on research translation, communication, and partnership building. A time line of key events in the history of the TWH program is shown in Figure 2.1. To enable this expanded activity, a small team of dedicated staff was assigned responsibility for a rejuvenated NIOSH program to integrate

FIGURE 2.1. Key Events in the History of the NIOSH Total Worker Health® Program

TOTAL WORKER HEALTH®
ADVANCING WORKER SAFETY, HEALTH, AND WELL-BEING



traditional safety and health protection with general health principles, policies, and practices.

Over the ensuing years, as the TWH program gained increasing traction with both intramural and extramural efforts, NIOSH was advised by key stakeholders that the foundational concept of safety and health protection for workers was sometimes diminished in favor of focusing on individual worker behavior change. Concerned by this misinterpretation and misapplication of the TWH approach to worker safety, health, and wellbeing, NIOSH made concrete programmatic changes with the goal of clearly articulating the vision that worker well-being can be advanced only when working conditions are safe and healthful. Through this approach, opportunities were created to expand knowledge about worker safety and health and enlarge the contribution that NIOSH can make to fulfill the mandate of the OSH Act “to assure so far as possible every man and woman in the Nation safe and healthful working conditions and to preserve our human resources . . . by developing innovative methods, techniques, and approaches for dealing with occupational safety and health problems” (Occupational Safety and Health Act, 2016, § 2(b)(5)).

EVOLUTION OF THE VISION

The purpose of the TWH predecessor program, the *WorkLife* Initiative, was “to better understand and promote the kinds of work environments, programs, and policies that result in healthier, more productive workers with reduced disease and injury and lower health care needs and costs” (NIOSH, 2009, p. 1). It was based on the idea that

comprehensive practices and policies that take into account the work environment—both physical and organizational—while also addressing the personal health risks of individuals, are more effective in preventing disease and promoting health and safety than each approach taken separately. (NIOSH, 2010, p. 1)

It recognized that the worksite provides the unique opportunity to “implement programs and policies to prevent both work-related risks and chronic illnesses and injuries that are linked to behavior-related choices” (NIOSH, 2009, p. 2). Based on both early research findings (Sorensen et al., 1995; Sorensen, Stoddard, Ockene, Hunt, & Youngstrom, 1996) and field experience, *WorkLife* forged the path for a more comprehensive consideration of the safety, health, and wellbeing of workers.

As *WorkLife* transitioned to the TWH program (Figure 2.1), TWH was defined as “a strategy integrating occupational safety and health protection with health promotion to prevent worker injury and illness and to advance health and wellbeing” (Weisfeld & Lustig, 2014, p. 2). The addition of “well-being” to the TWH definition arose from emerging research in the previous 20 years that health was necessary, but not sufficient, for maximum positive functioning in life and that well-being is a more complete characterization of the ultimate goal. Well-being is a concept akin to “flourishing.” Flourishing in life is

based on three aspects of mental well-being—emotional well-being, psychological well-being, and social well-being (Keyes, 2002). What makes life positive is work that contributes to the overall well-being of the individual worker. Positive psychology has greatly increased the emphasis on happiness and well-being—positive emotions, engagement in life and work, meaning and accomplishment (Seligman, 2011).

This original TWH definition was intended to clearly convey the need to break down traditional organizational silos of OSH protection and health promotion to maximize worker well-being. With OSH protection efforts focused on reducing hazards and exposure through organizational change in the workplace, and traditional health promotion activities aimed at reducing lifestyle risk factors by promoting healthy behaviors through individual change, organizational resources tend to be inefficiently invested. Early research was supportive of integrated efforts being more effective than this “silo approach” (NIOSH, 2012).

As thinking about the TWH approach continued to evolve in response to NIOSH stakeholder input and the developing scientific evidence base, it became clear that the first TWH definition did not adequately convey the complexities of the concept. In 2015, the definition of TWH was revised to “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” (NIOSH, 2015e, para. 1). Although the ultimate outcome of interest remains worker well-being, the revised definition better reflects the comprehensive approach, through policies, programs, and practices to addressing protection and illness and injury prevention in the workplace. Of note, the expression “promotion of injury and illness prevention efforts” was deliberately chosen instead of the term *health promotion* in order to clearly differentiate organizational approaches over individual behavior change. Integration, which means the connection of all relevant activities within the workplace, remains central to the approach. Integration itself can be thought of as an intermediate outcome of the TWH process. Without integration, the pathway to advancing worker well-being is hampered.

From a TWH perspective, worker well-being, the primary health outcome of interest, has been specifically defined as

an integrative concept that characterizes quality of life with respect to an individual’s health and work-related environmental, organizational, and psychosocial factors. It is the experience of positive perceptions and the presence of constructive conditions at work and beyond that enables workers to thrive and achieve their full potential. (Chari et al., 2018, p. 590)

The TWH worker well-being model has five domains: (a) physical environment and safety climate; (b) organizational policies and culture; (c) individual health status; (d) work evaluation and experience; and (e) home, community, and society (Chari et al., 2018).

The worker well-being definition and model are intended to accent the distinction between the TWH approach and more limited scope of worksite wellness programs. Unlike the typical worksite wellness program, the primary

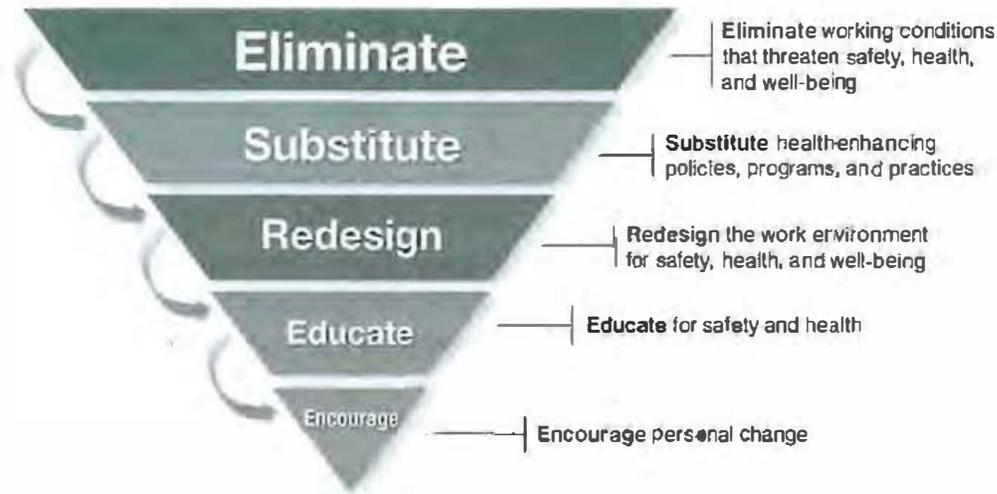
principle of TWH implementation is a fundamental focus on recognizing and addressing hazardous conditions of work and assuring provision of safe and healthful working conditions. The TWH approach is not a collection of health promotion efforts in a workplace that ignores the way work is organized and structured. The TWH approach is not consistent with workplace policies that discriminate against or penalize workers for their individual health conditions or create disincentives for improving health (NIOSH, 2015b). The TWH approach requires a strong commitment to better working conditions; a comprehensive approach to program development for worker safety, health, and well-being; the connection of all relevant parts of the organization; and a willingness to view the path to improved worker well-being as a continuum of progress from the simplest to the more sophisticated accomplishments.

Along with the revised TWH definition, in 2015 a completely revamped version of the list of issues relevant to TWH was released. Instead of the issues being grouped by workplace, workers, and employment, the issues were organized into nine topic areas (NIOSH, 2015b). The issue topics of concern to the TWH concept include (a) control of hazards and exposures, (b) organization of work, (c) built environment supports, (d) leadership, (e) compensation and benefits, (f) community supports, (g) changing workforce demographics, (h) policy issues, and (i) new employment patterns. These topics reflect the increasing breadth of issues related to 21st-century work that impact worker safety, health, and well-being. The list also places greater emphasis on the broad macroeconomic changes occurring in employment and in employment arrangements, as well as the emerging evidence of the societal and worker health effects of these changes (Howard, 2017).

Furthermore, the issues listed in the graphic make it clear that the TWH perspective does not emphasize individual behavior change. The public health community has long known that expectations of behavior change in the face of daily obstacles are an unreasonable expectation (Smedley & Syme, 2000). In fact, the OSH community has a long history of not relying on individual behavior change to assure worker safety and health, and this has been operationalized in the hierarchy of controls (NIOSH, 2015c). This traditional OSH strategy relies on hazard elimination as the most effective control and recognizes that controls that depend on human behavior, such as administrative controls or use of personal protective equipment, are the least effective means of protection. To strengthen the link between traditional OSH approaches and the TWH approach, NIOSH developed the hierarchy of controls applied to the TWH program (see Figure 2.2) to help organizations prioritize their efforts to advance worker safety, health, and well-being.

As in the traditional hierarchy, the controls and strategies are presented in descending order of anticipated effectiveness and protectiveness, as suggested by the cascading arrows. Application of this model begins with elimination of workplace conditions that cause or contribute to worker illness or injury or otherwise negatively impact worker well-being. The next level of the model focuses on replacement of unsafe, unhealthy working conditions or practices with safer, health-enhancing policies, programs, and management practices that

FIGURE 2.2. The Hierarchy of Controls Applied to NIOSH Total Worker Health®, 2016



improve the culture of safety and health in the workplace. Redesign of the work environment, where needed, for safety, health, and well-being is the third level of control. The least effective approaches to the TWH concept rely solely on safety and health education for workers and personal behavior changes for improvements to safety, health, and well-being. When these less effective controls are used, education should be provided to enhance individual knowledge for all workers and support should be provided for healthier choice-making.

The scientific evidence to support the TWH approach to worker safety, health, and well-being is growing, but there is much work to be done to inform the development of evidence-based policies, programs, and practices. Through investments in research and the transfer of this research into practice, NIOSH's long-term vision of the TWH program to protect the safety and health of workers and to advance their well-being by creating safer and healthier work environments will move closer to reality. It is anticipated that this vision will be fulfilled through knowledge generation, translation of that knowledge into practice, development of policy guidance, and building workforce capacity. To make progress toward these goals, NIOSH led efforts in 2016 to create a TWH national agenda for the next decade (2016-2026), which culminated in the publication of *A National Agenda to Advance Total Worker Health® Research, Practice, Policy, and Capacity* (NIOSH, 2016c).

EXPANSION OF THE VISION

The 2016–2026 TWH agenda, the first by a NIOSH cross-sector program within the framework of the National Occupational Research Agenda, is designed to expand the scientific evidence base for the TWH vision; to stimulate and more

finely focus research in this emerging area; and to broaden and engage the base of stakeholders who will, ultimately, move the TWH effort from research to practice.

Development of the agenda relied heavily on input from a broad, diverse group of academicians and researchers, worker representatives, private sector partners, and other stakeholders. The 2016–2026 TWH agenda calls for progress on four strategic goals for the nation to comprehensively advance the safety, health and well-being of workers: research, practice, policy, and capacity building.

Research

The 2016–2026 TWH agenda's *research* goal seeks to 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. Funding NIOSH Centers to conduct TWH-related research was an early programmatic strategy to focus research efforts on building the evidence base for this approach. There are currently six Centers, each with an active research portfolio reflective of the selective issues of interest to the TWH agenda (see Table 2.1).

The six Centers accomplish work across 13 academic institutions in the United States. Their regional presence and expertise play an important role in conducting novel research on the important connections between work, safety, and health. Each Center collaborates with regional employers, labor partners, and stakeholders to conduct research, design interventions, evaluate intervention effectiveness, and translate findings for workers and employers. They provide start-up grants to spur innovation and intervention among local employers. Some Centers have extensive outreach programs that provide tool kits, web-based training, continuing education courses, online video series, and actionable guidance documents.

The Centers design and conduct research that strategically focuses on occupations or industries of high or emerging risk, including workers in hospital, home health, and nursing home settings; construction; corrections; and manufacturing. Populations targeted for study include high-risk workers, such as younger and older workers, low-wage workers, contingent and part-time workers, and workers employed in small businesses. Critical areas of research focus include workplace stress, obesity, productive aging, work organization, shift work, fatigue, chronic disease, and sleep with an emphasis on how these conditions influence workplace injury, illness, productivity, and health care costs.

Despite the active research portfolios of these Centers, the evidence base supporting the TWH approach is still evolving, and knowledge gaps remain as evidenced in review of the literature by Anger et al. (2015) and Feltner et al. (2016). These reviews contribute to understanding the state of the scientific evidence for the TWH approach, as well as gaps in understanding and research needs. The review by Anger et al. sought to identify, evaluate, and critique the

TABLE 2.1. National Institute for Occupational Safety and Health Centers of Excellence for Total Worker Health[®]

Center name	First year funded	University affiliation(s)	Examples of research, outreach, and areas of focus
Center for Health, Work & Environment	2016	Colorado School of Public Health, University of Colorado Anschutz Medical Campus http://www.ucdenver.edu/academics/colleges/PublicHealth/research/centers/CHWE/Pages/TheCenter.aspx#	Advances worker health, safety, and well-being by educating future leaders, conducting research, and designing practical solutions for small- and medium-sized businesses and high-risk industries.
Center for the Promotion of Health in the New England Workplace	2006	University of Connecticut, University of Massachusetts-Lowell http://www.uml.edu/Research/CPH-NEW/About/default.aspx	Improves worker health through participatory processes and models involving frontline employees and top-down organizational support; current projects with health care workers, low-wage workers, and public safety/correctional officers.
Harvard T.H. Chan School of Public Health, Center for Work, Health and Well-being	2007	Harvard University, Northeastern University http://www.centerforworkhealth.sph.harvard.edu	Optimizes worker safety/health and employer outcomes by improving conditions of work; expands evidence on integrated approaches through etiologic and intervention effectiveness research, translating, and disseminating best practices and policies.
Healthier Workforce Center of the Midwest	2006	University of Iowa, Washington University (St. Louis) http://www.HWCMW.org	Generates/disseminates evidence-based TWH practices; focuses on small enterprises, the regional economy; partnerships between Iowa, Missouri, Nebraska, and Kansas tackle regional challenges.
Oregon Healthy Workforce Center	2011	Oregon Health and Science University, Portland State University, University of Washington, Johns Hopkins University, University of Oregon http://www.ohsu.edu/xd/research/centers-institutes/oregon-institute-occupational-health-sciences/oregon-health-workforce-center/	Focuses on integration to improve the health, safety, and well-being of workers through effectiveness research, collaboration, dissemination of evidence; research centers on truck drivers, young workers, and call center, health care, and construction workers.
University of Illinois-Chicago Center for Healthy Work	2016	University of Illinois at Chicago http://www.publichealth.uic.edu/healthywork	Focuses on health of workers in precarious jobs and hardship neighborhoods, using participatory and community-based approaches; projects use systems analysis/action learning to identify strategies for change.

Note. TWH = Total Worker Health.

empirical intervention studies in the scientific literature that combined or integrated OSH interventions with prevention-related activities in the workplace, consistent with the NIOSH definition of TWH. Seventeen studies met the criteria for inclusion. Although their review drew from a limited evidence base, it concluded that TWH interventions addressing both work-related injury risks and chronic diseases can improve workforce health effectively and more rapidly than the alternative of separately employing more narrowly focused programs to change the same outcomes in a fragmented fashion.

The 2016 systematic review by Feltner et al. was commissioned by the National Institutes of Health (NIH) to establish a baseline of evidence of the effectiveness of TWH research and to evaluate the potential benefits and harms of such interventions. It served as the foundation for a much more comprehensive project funded through the NIH's Pathways to Prevention Program. Feltner et al. (2016) concluded that, although research in this field was early and sparse, findings related to the utility of integrated TWH interventions, such as those that target OSH along with diet and nutrition and sedentary lifestyles, are encouraging.

The NIH Pathways to Prevention Program is designed to assist new fields of study with public health relevance to establish a trajectory that will successfully impact population health. The TWH approach was fortunate to be selected for study by this program. As a Pathways to Prevention Program study, an impartial, independent panel of experts was convened to identify research gaps and future research priorities for TWH. The panel conducted their work in a workshop that was organized around TWH-related evidence presented by invited experts. The full workshop report, including eight recommendations, was published in a peer-reviewed medical journal (Bradley, Grossman, Hubbard, Ortega, & Curry, 2016). In the same journal issue, NIOSH published a response to the panel's report that details planned actions to accomplish major activities based upon these recommendations (Howard, Chang, Schill, & Chosewood, 2016).

The most pertinent panel recommendations related to expanding the TWH evidence base addressed development of a core set of measures and outcomes in TWH-related research. This recommendation inspired the University of Iowa to host a TWH Research Methodology Workshop in early 2017. This workshop reviewed current methodological approaches and shortcomings and identified the most promising methods and standards for this emerging field of research, including development of a core set of measures and outcomes that could be incorporated into future TWH-related studies. Proceedings from this workshop (Healthier Workforce Center of the Midwest, n.d.) provide researchers with critical tools to conduct inquiries and interventions in a more systematic, standardized fashion while still encouraging innovation and exploration in individual research studies (Tamers et al., 2018).

Practice

Advancing TWH *practice* is the focus of the TWH agenda's second goal, which aims to increase implementation of evidence-based programs and practices that

are consistent with the TWH approach. To impact worker safety, health, and well-being, research knowledge must move into practice. The practice goal highlights the need to increase the implementation of evidence-based programs and practices that assess and improve the conditions workers face on the job while broadly working to prevent injuries and illnesses among workers, whether or not they are directly related to work.

A practice-oriented document published by NIOSH in 2016, *Fundamentals of Total Worker Health® Approaches: Essential Elements for Advancing Worker Safety, Health, and Well-being (Fundamentals: NIOSH, 2016a)*, furthers the goal of increasing the uptake and implementation of TWH practices. The *Fundamentals* document focuses on five defining elements of TWH: demonstrating leadership commitment to worker safety and health at all levels of the organization, designing work to eliminate or reduce safety and health hazards and promote worker well-being, promoting and supporting worker engagement throughout program development, ensuring the confidentiality and privacy of workers during program design and implementation, and integrating relevant systems to advance worker well-being. The intention of the *Fundamentals* document is to accelerate the uptake and use of TWH concepts in day-to-day practice within organizations through practical self-assessment tools and the development of actionable steps for implementing changes.

The practice goal was written to inspire the development of novel interventions, within the research portfolios of NIOSH, the NIOSH Centers, and among a growing network of TWH Affiliates. Established by NIOSH in 2014, the NIOSH TWH Affiliates Program (NIOSH, 2017) is an unfunded volunteer collective of academic, government (state and federal), labor, industry, and nonprofit organizations with a mission of fostering an integrated approach to protecting and promoting worker well-being through active collaboration. TWH Affiliates work with NIOSH and with other affiliates to increase the visibility, uptake, and impact of TWH interventions. Their joint, complementary efforts greatly expand the limited reach of NIOSH intramural- and extramural-funded activities. Members of the TWH Affiliate network may assist NIOSH by conducting joint research or providing populations for intervention studies; by developing program materials, trainings, and other work products; collaborating on seminars, meetings, trainings, and educational events; and by cross-promoting and disseminating publications and other communication products. Many of the TWH Affiliates, both academic and nonacademic, serve as test beds for the development of promising practices, actively share learnings from pilot projects, and assist with dissemination of TWH research to their own regional or national networks.

Policy

Policy change often represents later, lagging evidence of programmatic or scientific influence from research, albeit an enduring influence. The TWH agenda's policy goal aims to promote adoption of policies that simultaneously protect workers and improve their health and well-being by focusing

on policy development at the local, organizational, regional, and national levels. Although much work remains to be done, early efforts are underway in this area.

Comprehensive “tobacco free” workplace policies are a classic example of an organizational-level policy. When developed as a policy with integrated interventions that address both the workplace and individual workers, such policies serve to protect all workers from secondhand exposure to tobacco smoke and assist individuals with cessation efforts. Taking a TWH perspective, NIOSH developed a comprehensive *Current Intelligence Bulletin* to provide an authoritative source for workplace tobacco policies (NIOSH, 2015a).

Designing paid leave policies and other health-related benefits from a health-enhancing perspective is increasingly a focus at both the state and national level. NIOSH research on paid sick leave is helping to inform these decisions. For example, Asfaw, Pana-Cryan, and Rosa (2012) found that a reduced incidence of acute injury was seen among companies offering paid sick leave compared to companies not providing this benefit. With all other variables held constant, workers with access to paid sick leave were 28% less likely than workers without access to paid sick leave to be injured. The association between the availability of paid sick leave and the incidence of occupational injuries varied across occupations but was greatest in high-risk occupations. The authors concluded that, similar to other investments in worker safety and health, introducing or expanding paid sick leave programs might help businesses reduce the incidence of nonfatal occupational injuries, particularly in high-risk sectors and occupations.

Capacity Building

The final goal of the agenda encourages building capacity to strengthen the TWH workforce and TWH field to support the development, growth, and maintenance of policies, programs, and practices that advance worker well-being. Capacity building helps NIOSH and others engaged in advancing TWH concepts ensure that a sustainable professional community will emerge to support and implement efforts for organizations over the long term. Important work with a number of high-visibility partners is moving this effort forward, and a number of activities to build capacity have been already initiated. For example, continuing education credits for physicians, nurses, industrial hygienists, safety professionals, health promotion professionals, and human resources professionals and others are available through the TWH webinar series and other NIOSH offerings. Several universities, some of which are TWH Affiliates, offer accredited, graduate-level certificate programs for students and early and mid-career OSH professionals looking to sharpen or retool their skill in this subject area. Many of the Centers also work to build capacity by offering recurring, continuing education courses and training modules, both live and on-demand, with some offering lengthier summer institutes in specialty areas related to the TWH program. Others offer weeklong, multidisciplinary executive training programs for business leaders and OSH professionals

to help bridge historic divides among disciplines, leverage expertise, and support integrated efforts.

NIOSH also engages with academic partners, specialty societies, labor partners, and private-sector employers to better define the needs of professionals in fields related to and overlapping with TWH approaches. This work will help identify key competencies for professionals who deliver integrated safety and health interventions. These collaborations will inform the future development of a core curriculum for full undergraduate- and graduate-level degrees for TWH professionals. Collaborations with private industry representatives and other stakeholders throughout the curriculum development process will keep the focus on the needs of potential future employers of these academically prepared professionals. Long-term plans for the development of a professional society representing specialists and professionals within the TWH field are also under consideration.

FUTURE VISION FOR THE TWH PROGRAM

As the nature of work changes, and with it the demands placed on workers, the TWH concept must evolve to meet the needs of workers facing new challenges. The interdependence of economies; the pace of commerce; the drive for greater productivity; and rapid, just-in-time market cycles all lead to unprecedented demands upon workers that are increasingly complex. Traditional hazards encountered by workers stubbornly remain in many industries and occupations. Although legacy exposures persist, new ones appear with every technological advancement. In addition, the way in which work is accomplished; how work is organized and scheduled; how we interact around the globe; and, even more basically, how workers are employed are rapidly shifting. This complex, ever-changing environment demands approaches and strategies that comprehensively safeguard and promote the health of workers.

In alignment with this need, NIOSH's TWH program will continue to champion a broad, holistic approach to assessing and addressing the needs of workers facing this new world of work. The TWH focus will remain on the nature of the work itself, maintaining a steadfast commitment to advancing improvement of working conditions and using input from and participation of workers who are most affected by the work. Policy, program, and practice interventions will require customization by taking into account the specific safety and health challenges facing workers on and off the job. Any solutions that are one-size-fits-all; that do not account for workers' needs, preferences, wages, cultures, and personal challenges; or that do not account for the tremendous variability of risks among organizations of different sizes, geographies, industries, and occupations, will become increasingly inadequate.

The NIOSH TWH program will continue to advance the evidence base for interventions that address worker and organizational needs on a comprehensive and holistic basis. This direction will include focusing research on the impact of the dramatic shifts being seen in employment, work arrangements,

work schedules, job design, and work organization. It will necessitate investments in surveillance systems (or augmentation of existing ones) to better track the connections between working conditions, occupation, industry and chronic diseases, like cancer, heart disease, diabetes, obesity, and depression.

Research investments must be used to inform our understanding of etiologies and antidotes for the epidemic of work-related stress, which is largely due to unhealthful working conditions, poorly organized work, and excessive physical and psychological demands on workers. Additional research is needed on the challenges faced by working families, exploring the links between societal roles and employment, characterizing and better understanding conflicts between work and family demands, and crafting new solutions. Critical new insights are needed into serving the health and safety needs of an increasingly diverse workforce and the myriad of safety and health issues that are impacted by cultural differences, disparities, and inequalities. Last, NIOSH and its partners will be challenged to better define, measure, and track individual, organizational, and national well-being in the context of work and employment.

CONCLUSION

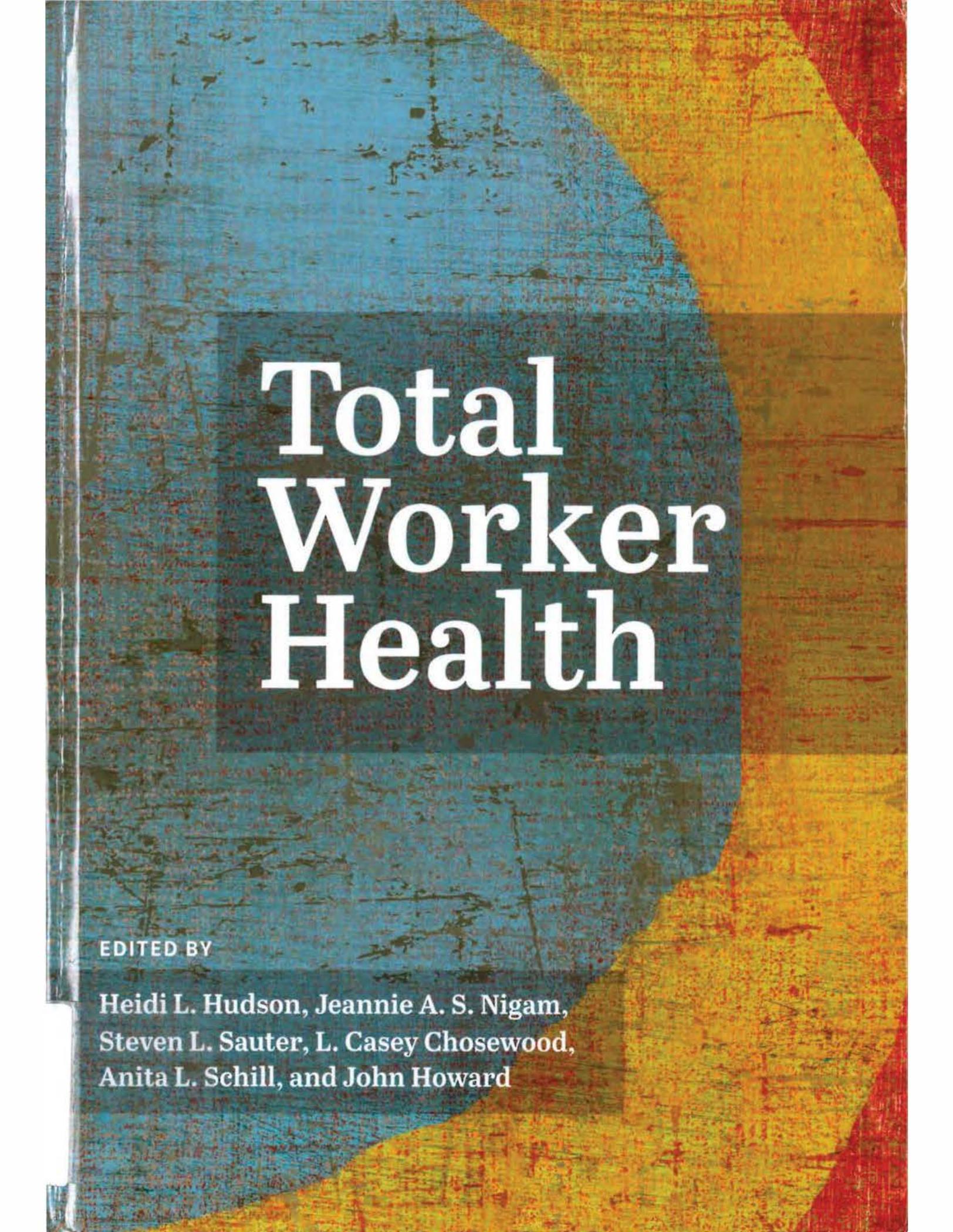
The long-term vision of the TWH program is to protect the safety and health of workers and to advance their well-being by creating safer and healthier work and work environments. This paradigm-shifting approach to OSH holds promise for thinking about existing problems in new ways, expanding the bounds of knowledge in new directions, and implementing solutions that match the changing world of work. This is a vision beyond what NIOSH can accomplish alone. It requires commitment from researchers, academics, practitioners, employers, workers, labor representatives, policymakers, and all those who share the vision that it is possible to design jobs that protect safety, enhance health and create work in which every worker has the opportunity to thrive.

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AMERICAN PSYCHOLOGICAL ASSOCIATION
Washington, DC

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Published by
American Psychological Association
750 First Street, NE
Washington, DC 20002
<https://www.apa.org>

Order Department
<https://www.apa.org/pubs/books>
order@apa.org

In the U.K., Europe, Africa, and the Middle East, copies may be ordered from Eurospan
<https://www.eurospanbookstore.com/apa>
info@eurospangroup.com

Typeset in Meridien and Ortodoxa by Circle Graphics, Inc., Reisterstown, MD

Printer: Sheridan Books, Chelsea, MI
Cover Designer: Beth Schlenoff Design, Bethesda, MD

Library of Congress Cataloging-in-Publication Data

Names: Hudson, Heidi, editor. | Nigam, Jeannie A. S., editor. | Sauter, Steven L., 1946- editor.

Title: Total worker health / edited by Heidi L. Hudson, Jeannie A. S. Nigam, Steven L. Sauter, L. Casey Chosewood, Anita L. Schill, and John Howard.

Description: Washington, DC : American Psychological Association, [2019] | Includes bibliographical references and index.

Identifiers: LCCN 2018061043 (print) | LCCN 2019017619 (ebook) |

ISBN 9781433831164 (ebook) | ISBN 1433831163 (ebook) |

ISBN 9781433830259 (hardcover) | ISBN 1433830256 (hardcover)

Subjects: LCSH: Industrial hygiene. | Industrial safety.

Classification: LCC HD7261 (ebook) | LCC HD7261 .I558 2019 (print) | DDC 658.3/82--dc23

LC record available at <https://lcn.loc.gov/2018061043>

<http://dx.doi.org/10.1037/0000149-000>

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1