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AIHA Total Exposure Health aspects of *Total Worker Health®*: Advancing Worker Well-Being

Guidance Document

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Task

Using the Total Worker Health® graphic from the NIOSH website, highlight areas that have exposure-based inputs. Create content for the AIHA Total Exposure Health webpage and highlight areas that have a connection to industrial hygiene (IH) and write a paragraph for each indicating where the IH professional can fit in.

Approach

1. Using the NIOSH *Total Worker Health* (TWH) graphic[1] and the 75 subcategories, highlight any categories that have exposure-based inputs and a connection to IH. Note, the subcategories are also referred to as "issues" or "aspects."

2. For those subcategories that are highlighted in Step 1, prepare content for the AIHA Total Exposure Health (TEH) webpage. That is, indicate where the IH professional can "fit in" these subcategories and opportunities for IH professionals to make contributions relevant to the subcategory. The content will be roughly one paragraph in length.

3. Via email, provide the content to the chair and vice-chair of the TEH/TWH Advisory Group (AG), courtesy-copying (CC-ing) Alla Orlova, for initial review prior to sending the content to the larger TEH/TWH AG.

4. Provide reviewed and edited content to TEH/TWH AG for comment.

In completing this task, the following has been taken into consideration:

A. The AIHA TEH Vision Statements:

 1. Occupational and environmental health and safety (OEHS) professionals understand how occupational and non-occupational exposures combine to affect health outcomes and how to engage IH/OEHS skillsets in assessing all exposures and their integration for overall exposure.

 2. OEHS professionals are recognized as exposure science experts that anticipate, recognize, evaluate, and control all exposures that combine to impact human health.

 3. OEHS professionals are seen as valued partners collaborating with other scientific communities on initiatives involving integrating exposure data with other determinants of human health (e.g., TWH, exposomics, and TEH).

B. The NIOSH TWH definition: "*Total Worker Health*® is defined 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."

C. This task is not intended to replace any interpretation of the NIOSH TWH graphic or the stated issues as communicated by NIOSH. The task deliverable is intended to assist those items in improving understanding of where exposure scientists (i.e., IH professionals) can provide meaningful input into the various issues and elements related to adopting and establishing a TWH or TEH approach.

D. The task deliverable is intended to support the expansion of IH professionals' thinking, role, and service delivery with regards to where exposures may or may not be relevant to TEH and TWH. Ultimately, the input opportunities highlighted herein should provide guidance for IH professionals in leading and supporting "healthier workplaces and a healthier world."

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[1] Page 24 of this AIHA Guidance Document appends the NIOSH Graphic entitled 'Issues Relevant to Advancing Worker Well-Being Using Total Worker Health Approaches' that can also be found at https://www.cdc.gov/niosh/twh/pdfs/Issues-Graphic-2020_508.pdf.

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E. The task deliverable was prepared to address IH professionals as recognized "exposure scientists" and not the broader category of OEHS professionals.

F. Issues where IH professionals can have input typically involve the classical risk management cycle or parts thereof, and likewise elements of the broadly accepted IH definition, including anticipation, recognition, evaluation, and control of environmental factors and stressors arising from the workplace.

Highlighter color key:

1. In subcategories highlighted in **orange**, IH professionals have opportunities for direct, exposure-based input.

2. In subcategories highlighted in **teal**, IH professionals typically do not have opportunities for direct exposure-based input, but there are opportunities for partnerships and collaborations with other professionals and scientists.

3. In subcategories that are not highlighted, IH professionals do not have opportunities for exposure-based input.

Prevention and Control of Hazards and Exposures

Biological Agents

Biological agents are found in natural and built environments and include bacteria, viruses, fungi, arachnids, algae, parasites, other microorganisms, and their associated toxins. They can adversely affect human health leading to a range of health symptoms and outcomes, such as relatively mild allergic reactions, infections, irritation, inflammation, and, in some cases, serious medical conditions resulting in death. At work, in our homes, and in the community, everyone experiences daily exposure to biological agents at varying concentrations without harm.

Many biological agents can spread from person to person either directly or indirectly.

IH professionals provide the exposure science expertise to anticipate, recognize, evaluate, and control risks of exposure to biological agents that can impact human health. In assessing potential exposure to biological agents, IH professionals can integrate occupational and non-occupational exposures to determine overall exposure. In this subcategory, IH professionals have direct, exposure-based inputs and routinely partner and collaborate with other professionals to prevent exposures, examine exposure data, and develop exposure control plans.

Chemicals

Globally, scientific organizations and geographical jurisdictions have established occupational exposure limits (OELs) for hundreds and thousands of chemical agents. These OELs represent conditions under which workers may be exposed daily and without harm. IH professionals specialize in understanding how occupational and non-occupational chemical exposures combine to impact health outcomes, integrating those exposures for the determination of overall exposures, and providing the necessary exposure science expertise to anticipate, recognize, evaluate, and control chemical exposures. In this subcategory, IH professionals have direct, exposure-based input and routinely partner and collaborate with other professionals to prevent exposures, examine exposure data, and develop chemical exposure control plans.

Ergonomic Factors

There are three major areas of ergonomics: physical, cognitive, and organizational. Ergonomic risk factors include awkward postures, bending, compression or contacts stress, forceful exertions, insufficient rest breaks, lifting, lighting, extreme temperatures, and noise. The science of ergonomic studies includes a full range of tasks, including, but not limited to, lifting,

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holding, pushing, walking, and reaching. Classically-trained IH professionals typically study ergonomics, often during post-graduate studies, and understand the benefits of a well-designed ergonomic work environment and its relationship to worker health, work efficiency, reduction of accidents and injuries, and lower operating costs.

While IH professionals who have achieved accreditation (i.e., as a CIH, ROH, etc.) have demonstrated knowledge and possibly competency in applied ergonomics, some IH professionals may not have the requisite knowledge, expertise, or qualifications. Still, qualified IH professionals can have direct, exposure-based inputs in this subcategory; are able to anticipate, recognize, evaluate, and recommend controls to mitigate risk of injurious exposure to ergonomic factors in occupational and non-occupational settings; and can integrate those exposures to determine overall exposure. In this subcategory, IH professionals routinely partner and collaborate with other professionals to prevent exposures, examine exposure data, and develop ergonomic control plans.

Physical Agents

Physical agents are sources of energy that may cause injury or disease. In general, physical agents cannot be detected visually, with examples including noise, vibration, radiation, and extreme temperatures. The health effects and target organs of physical agents vary greatly based on the nature of the physical agent. As a result, occupational diseases that are related to overexposure to physical agents often go unrecognized and unclaimed.

Classically trained IH professionals typically study physical agents, often during post-graduate studies, and understand how to apply exposure science in this aspect. However, while IH professionals who have achieved accreditation (i.e., as a CIH, ROH, etc.) have demonstrated knowledge and possibly competency in evaluating and controlling physical agents,

some IH professionals may not have the requisite knowledge, expertise, or qualifications for evaluating all physical agents. For example, while expertise on noise and hearing conservation may be routinely part of IH professionals' service delivery, not all IH professionals are able to conduct qualitative and quantitative risk assessments for ionizing radiation.

Still, IH professionals, as trained exposure scientists, have various detection techniques and instruments available to help them quantify exposures to physical agents, both in occupational and non-occupational settings. Therefore, qualified IH professionals can have direct, exposure-based input in this subcategory; are able to anticipate, recognize, evaluate, and control those exposures; and can integrate occupational and non-occupational exposures to physical agents in order to determine overall exposure. In this subcategory, IH professionals routinely partner and collaborate with other professionals to prevent exposures, examine exposure data, and develop control plans for noise, vibration (both to the whole body and to the hand an arm), radiation (ionizing and non-ionizing), extreme temperatures, and pressure (compressed or decompressed).

Psychosocial Factors

For many people, work environments are where they spend most of their waking hours. Often, workers perform activities that they perceive as demanding, constraining, and otherwise stressful. Mental health problems and stress-related disorders are among the leading causes of early retirement from work, high absentee rates, overall health impairment, and reduced organizational productivity. Generally, there are thirteen recognized psychosocial factors that can impact worker health: psychosocial support, organizational culture, leadership and expectations, civility and respect, psychological competencies and requirements, worker growth and development, worker recognition and rewards, worker involvement and influence, workload management, worker engage-

ment, work-life balance, psychological protection of workers, and protection of personal physical safety. Some jurisdictions have developed standards for psychological health and safety as voluntary guidelines intended to support organizations in promoting mental health and preventing psychological harm at work. Issues impacting worker mental health can also include stigma and discrimination, stress, relationships between demand and control or effort and reward, presenteeism, job burnout, harassment, violence, bullying and mobbing, and substance use, misuse, and abuse at work.

IH professionals are trained to assess occupational stress and psychosocial stressors, interpret assessment data, and recommend controls. However, many IH professionals have not completed the coursework or training to conduct a full risk assessment, or risk management cycle, for the evaluation of psychosocial stressors. IH professionals should develop their skills to include, at minimum, awareness and recognition of psychosocial risks and should know the established processes to contact and engage qualified professionals, such as organizational psychologists, to evaluate and manage these risks. Qualified IH professionals will be able to manage the full cycle, and their evaluation of occupational exposures should include stress and psychosocial factors such as those listed previously. As such, an IH professional can provide direct, exposure-based input in this subcategory and can partner and collaborate with other professionals to support the promotion of mental health and prevention of psychological harm at work.

Risk Assessment and Management

In general, organizations establish occupational health and safety control programs that employ risk-based approaches. IH professionals routinely support these programs by conducting occupational health risk assessments, evaluating controls, training workers in implementing control programs, and,

in general, contributing meaningfully to effective risk management. That is, IH professionals often lead or support every phase of risk management. IH professionals provide direct, exposure-based input in risk assessment and risk management, as they anticipate, identify, assess (qualitatively and quantitatively), and recommend controls for occupational and non-occupational health risks. The outcomes of IH professionals' work can be used to prioritize goals and objectives related to risk management and to promote TEH.

Built Environment Supports

Accessible and Affordable Health-Enhancing Options

Health-enhancing options can include routine physical exercise, healthy diet, adequate sleep, seatbelt use, and toothbrushing. While some of these options are available to most people, others are not accessible or affordable to everyone. Workers that are physically active, have healthy body weight, and are well rested are less likely to be injured or become ill both in occupational and non-occupational exposure settings. Employers may have opportunities to increase accessibility and affordability to health-enhancing options for workers via workplace programs and benefits. Access and affordability impact the effectiveness of health-enhancing options, help achieve the best health outcomes and contribute to workers' overall personal health and well-being. While IH professionals do not typically have direct, exposure-based input into this aspect, IH professionals, in concert with other workplace leaders and health professionals, can provide a bridge to understanding the relationship between TEH or TWH and the importance of providing and using accessible, affordable health-enhancing options. IH professionals can also collaborate with others to encourage the use and uptake of health-enhancing options by workers and provide coaching and leadership on health ed-

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ucation, healthy lifestyles, and their impact on TEH and TWH.

Clean and Equipped Breakrooms, Restrooms, and Lactation Facilities

Depending on the potential hazards present in the workplace, IH professionals can have varying degrees of direct, exposure-based input into this aspect. Laws and best management practices have established standards for workplaces that require the availability of breakrooms and restrooms. In some situations, workers need access to lactation facilities during their shifts. It is crucial that these areas are maintained in clean, sanitized conditions and equipped with facilities for workers' use that are in good condition and fully functional. In workplaces where agents are present that are potentially hazardous by ingestion, these areas must meet additional requirements for thorough and adequate cleaning and sanitization. IH professionals can have direct, exposure-based input into this aspect, such as by providing leadership and support to workplace programs and by evaluating and assessing such programs' effectiveness.

Healthy Workplace Design and Environment

The built environment can have a key role in personal well-being. Healthy workplace design reduces stress and provides an atmosphere where workers feel comfortable and calm and are better able to perform. A healthy work environment promotes good health, eliminates harm, emphasizes the importance of activity, and provides choices in activities. It features natural light, good air quality, and sound absorption and uses shared areas like copy rooms, kitchens, and meeting spaces. Workers can get out of their chairs at regular intervals and move about the building. Interior signs and graphics inform yet do not distract. Desks are adjustable to both sitting and standing height. Workers have access to nearby fitness centers and the workplace communicates

and supports the importance of work-life balance. Open stairwells physically connect workers and encourage movement and interaction. A well-designed workplace recharges and refreshes workers, and IH professionals can have direct, exposure-based input into this aspect by assessing risks, planning programs, communicating with participants (including through training and coaching), and implementing controls that reduce exposures potentially impacting health.

Inclusive and Universal Design

Inclusive design in built environments focuses on solutions for specific individuals or uses and addresses existing needs not typically considered during the design process. With diverse workforce populations, inclusive designs consider cultural, social, and other needs; provide solutions for a wider range of workers; increase accessibility; and support the ergonomic principle of fitting tasks to workers. In comparison, universal design focuses on a single solution that can be used by as many people as possible with the aim of making the built environment usable by the highest number of people. Although IH professionals do not typically lead efforts behind built environment design for workplaces, they can partner and collaborate with other professionals in the process providing input related to assessment and programs.

Safe and Secure Facilities

"Safe" refers to protection from unintended threats, mishaps, or accidents, whereas "secure" refers to protection against deliberate threats such as crime. The existence of numerous occupational hazards require workplaces to be both safe and secure for workers and their communities. Potential safety and security risks include the presence of large quantities of hazardous chemicals, radioactive materials and radiation sources, biological agents, safety equipment (including mobile equipment), heavy machinery, and sources of hazardous energy such as

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electrical and pressurized systems. For the continued health of workers and communities, these potential risks need to be safely contained at all times, with restricted and secure access. Facilities and areas within facilities may also require security measures, such as single points of entry, authorization for entry, escorts, locked doors, and fences, to prevent entry by unauthorized persons. IH professionals can have direct, exposure-based input into this aspect.

Community Supports

Access to Safe Green Spaces and Pathways

People who live and work in areas with grass and trees tend to be at lower risk for health conditions like high blood pressure and cardiovascular disease. Access to safe green spaces and usable areas within those spaces, such as through pathways, are associated with positive mental health. Outdoor green space environments offer spaces for physical activities such as recreational walking. The relationship between access to safe green spaces, increased physical activity, and reduced sedentary time is an important concept to TEH and to improving health outcomes for workers. While IH professionals do not typically lead efforts to provide workers and communities with access to safe green spaces and pathways, they can provide important health promotion information and support these efforts through training, coaching, and planning.

Healthy Community Design

The design of communities can impact human physical and mental health. Healthy community design promotes healthy living by situating homes closer to businesses, schools, important community resources, and parks, resulting in benefits such as less automobile use, more walking and cycling, increased daily physical activity and social interaction, and community members' improved physical and mental health. People can age in place and remain all their lives in communities that reflect their changing lifestyles and physical capabilities. Other benefits include improved air quality, decreased risk of injuries, and reduced contributions to climate change. While IH professionals do not lead efforts to design healthy communities, they can provide important health promotion information and support these efforts through training, coaching, and planning.

Safe and Clean Environment (Air and Water Quality, Noise Levels, Tobacco Free)

The elimination of health hazards through the provision of safe and clean environments—specifically, by maintaining air and water quality, limiting noise levels, and reducing tobacco use—promotes good health and personal well-being. Therefore, providing such environments is critical to TEH and TWH. Improved air and water quality contributes to the prevention of heart attacks, reduces lost workdays, decreases mortality, and promotes healthy brain and body function, growth, and development. Appropriate noise levels reduce community members' risk of noise-induced hearing loss as well as the stress that results from elevated sound levels. Tobacco-free communities reduce risk of cancers, including lung cancer, and improves the health outcomes of community members. Controlling air and water pollutants, noise levels, and tobacco use is also critical to a TEH approach, as TEH takes into consideration the impact of all exposures on worker health in occupational and non-occupational environments. IH professionals can have direct, exposure-based input in this area and may routinely partner and collaborate with other professionals to eliminate or mitigate exposures, examine exposure data, and develop control plans.

Safe, Healthy, and Affordable Housing Options

When safe, healthy, and affordable housing options are provided to individuals within communities, the benefits that are realized include improved indoor

environment and air quality, proper insulation, reduced overcrowding, fewer evictions, increased investment in local communities, more job opportunities, and healthier populations. Homes that are safe, healthy, and free from physical hazards promote good mental and physical health. Conversely, inadequate, low-quality housing options contribute to increased risks of health issues, including physical injuries, chronic diseases, and impaired childhood development. IH professionals typically have direct, exposure-based input within the area of evaluating, controlling, and validating safe and healthy housing options, such as prior to residents reinhabiting a home after a fire, a building collapse, a water intrusion event, the removal of harmful microbial growth or hazardous materials, and other circumstances that may make buildings dangerous for human habitation.

Transportation and Commuting Assistance

Effective, sustainable transportation has been reported to enhance physical, mental, and emotional health. Benefits include increased physical activity—that is, increased walking and public transit system use—reduced air pollutants, improved carbon footprint, reduced respiratory diseases, improved community engagement, improved time management for workers, cost savings, and increased convenience. However, IH professionals do not have direct, exposure-based input into this aspect.

Compensation and Benefits

Adequate Wages and Prevention of Wage Theft

Low income and inadequate wages are associated with increased negative health outcomes, including higher rates of infant mortality, shorter life expectancy, and higher death rates for the leading causes of death: heart disease, cancer, acute injuries, chronic lower respiratory disease, stroke, Alzheimer's disease, diabetes, influenza, and pneumonia. The non-payment of wages that workers are legally entitled to, also known as wage theft, is a major contributor to low income and the adverse health effects cited above. Resources should be developed within the area of public health to assist in mitigating the impact of low-income status on health. IH professionals do not have direct, exposure-based input into this aspect.

Affordable, Comprehensive, and Confidential Healthcare Services

Primary healthcare service delivery is intended to provide continuous and comprehensive care to patients. Healthcare needs to be affordable, accessible, and of sufficient quality to be effective. Outcomes of providing affordable and accessible healthcare may include reductions in health insurance coverage disparities, increases in preventive care, improved health outcomes, and reduced rates of health spending. To achieve the best health outcomes, improved access to healthcare is needed to support the timely use of healthcare services. Because people without health insurance coverage cannot access the care they require, they are less likely to receive preventive care and to seek care quickly when they are sick, resulting in fewer positive health outcomes and higher costs when treatment is sought and received. Furthermore, confidential healthcare services respect individuals' rights to privacy and build trust between healthcare recipients and providers. People who are willing to disclose private, confidential information to healthcare providers can be effectively treated and counselled appropriately. However, if information is not kept confidential, people requiring healthcare will be reluctant to disclose important information, which may negatively impact their treatment and health outcomes.

Although the framework of TEH takes into consideration the impact of occupational and non-occupational exposures on human health, IH professionals

do not have direct, exposure-based input into the provision of affordable and comprehensive healthcare services. However, the element of confidentiality can sometimes be addressed by IH professionals, as it relates to activities with the IH sphere, such as biological monitoring, return-to-work programs, work hardening, and functional ability assessment programs. IH professionals, in concert with other health professionals, can collaborate to understand the importance of confidential healthcare services and establish standards to protect confidential personal health information.

Chronic Disease Prevention and Management Programs

Chronic disease prevention typically includes mitigating risks of potentially injurious exposures, reducing risks for negative health outcomes, improving or maintaining individuals' current state of personal health and well-being, and promoting healthy lifestyles. Many occupational and non-occupational hazards—such as contaminated air, unclean water, poor diet, tobacco use, and alcohol consumption—pose risks of exposures that may lead to chronic diseases. Therefore, chronic disease management is an important part of mitigating risk, reducing harm, improving health outcomes, and minimizing the burden of disease for individuals and healthcare systems. As the TEH framework considers the impact of all occupational and non-occupational exposures on human health, there are opportunities for IH professionals to have direct, exposure-based input into this aspect. These opportunities may include supporting education in chronic disease prevention and awareness; health promotion; risk assessment; control and management programs; integrated care approaches to managing illness, including screenings, check-ups, monitoring, treatment, and education; substance use cessation programs; and support networks.

Continual Learning, Training, and (Re-) Skilling Opportunities

The concept of continuous learning requires that workers are provided with opportunities to learn constantly through their work, job-lives, and lifestyles. Although workers habitually develop skills and acquire knowledge and abilities that make them better at their jobs, they need to be individually keen and motivated to learn and develop their skillsets outside what is immediately required for their work. Opportunities for continuous learning, training, and reskilling can have value to both workers and organizations. Workers are likely to experience improved mental health and job satisfaction as they focus on their goals, increase their engagement and productivity, and become more innovative. While IH professionals do not typically lead initiatives for continual learning, training, and reskilling opportunities, they can meaningfully contribute to these initiatives by providing support, coaching, and planning.

Disability Insurance (Short- and Long-Term)

Disability insurance can provide critical support to workers and the families of workers who experience illnesses or injuries that render them unable to work and earn income. Short-term disability insurance provides coverage for costs immediately following the onset of a serious illness or injury. In contrast, long-term disability insurance serves as income replacement when a person's condition does not permit them to return to work and when they require insurance benefits beyond the time period covered by short-term disability insurance. Without long-term disability insurance coverage, workers will come to work injured or ill, and their injury or illness will be exacerbated or contribute to another negative health outcome. While IH professionals do not typically lead the establishment of disability insurance coverage for workers, they can meaningfully contribute to this aspect by providing education, support, and return-to-work programs.

Employee Assistance and Substance Use Disorder Programs

Substance use disorders include binge drinking, heavy drinking, and illicit drug use. Workers with substance use disorders can experience reduced productivity, increased absenteeism, increased injuries, increased healthcare costs, worksite disruptions, and mental health issues. Although substance use issues are typically underrecognized and undertreated, workers with substance use disorders can receive assistance, support, and comprehensive behavioral health resources through Employee Assistance Programs (EAPs), which workplaces generally offer alongside other health promotion, disease management, and disability programs. When EAPs are provided for substance use disorders, they offer services such as preventative care, screening, early identification, counseling, specialty treatment referrals, and behavioral health interventions. However, while workplaces have important opportunities to address substance use disorders via EAPs, IH professionals do not have direct, exposure-based input into this aspect.

Equitable Pay, Performance Appraisals, and Promotions

Equitable pay refers to consistency of salary amongst employees within an organization. An internal equitable salary structure enables workers to receive proportionally fair treatment in terms of pay, based on clear expectations communicated by the employer. Performance appraisals regularly review employees' job performance, contributions to a workplace, and their skills, accomplishments, and development. A performance appraisal system typically feeds information into the workplace's advancement or promotion process. IH professionals do not have direct, exposure-based input into this aspect.

Minimum Guaranteed Hours

Workers that are guaranteed a minimum number of work hours per day are paid for that guaranteed minimum each workday, even when they work less time than the guaranteed minimum. When work hours are not guaranteed and employers use work scheduling strategies that are based on demand, there are negative impacts on employees, their earnings, their abilities to meet financial commitments, and ultimately, their mental and physical health. However, IH professionals do not have direct, exposure-based input into this aspect.

Paid Time Off (Sick, Vacation, Caregiving, Parental)

Paid time off when workers are sick (i.e., sick leave) provides support for workers who cannot work due to illness or injury, time for workers to seek medical care, and paid downtime for workers' self-care and healing. Paid vacation and sick days aid workers in maintaining good physical and mental health and well-being. Paid parental leave enables workers to care for and bond with newborn, newly adopted, or newly placed children. Family caregiver leave can be paid or unpaid and provides job-protected leave for a specific period. Family medical leave is also job-protected leave available for workers who have relatives with serious medical conditions. While important to healthy workplaces, IH professionals do not have direct, exposure-based input into this aspect.

Prevention of Healthcare Cost Shifting to Workers

IH professionals do not have direct, exposure-based input into this aspect.

Retirement Planning and Benefits

Retirement planning provides a process for identifying retirement needs and income goals and the necessary actions and decisions to achieve those goals. Identifying sources of income, estimating ex-

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penses, implementing savings programs, and managing assets and risks are part of retirement planning. The ability to achieve a retirement income goal is assessed based on estimated cash flow during retirement. Some workers may be offered workplace-sponsored plans to assist with this preparation. IH professionals do not have direct, exposure-based input into this aspect.

Work-Life Programs

Work-life programs create flexible, supportive environments that engage workers, balance workers' responsibilities with their personal lives, and maximize organizational performance. Work-life programs include opportunities for worksite health and wellness, Employee Assistance Programs, workplace flexibility, remote work (i.e., work from home), and dependent care. As noted above regarding the aspects of health enhancing options and built environment supports, work-life programs encourage behaviours that include routine physical exercise, healthy diet, and adequate sleep. IH professionals can have direct, exposure-based input into this aspect by providing support for elements such as work arrangements and environments and by recognizing, evaluating, and controlling hazards in the workplace, home, and community. Additionally, IH professionals can partner with other workplace leaders and health professionals to provide a bridge to understanding the relationship between TEH or TWH and the importance of work-life programs.

Workers' Compensation Benefits

Workers' compensation benefits provide financial support to employees who become injured or ill from work-related causes and reduce worker liability for work-related injuries and illnesses. This aspect includes medical coverage, disability benefits, missed wage replacement, rehabilitation, and death benefits. IH professionals have opportunities for direct, exposure-based input into this aspect with regards to leading and supporting injury or illness investigations, communicating with workplace parties, supporting early and safe returns to work, and contributing important information related to the anticipation, recognition, evaluation, and control of hazards in the workplace, home, and community. Additionally, IH professionals can partner with other workplace leaders and health professionals to support workers and management, compensation claims pending adjudication, and requests for information.

Healthy Leadership

Collaborative and Participatory Environment

Teams composed of community health professionals, healthcare professionals, and specialists such as IH professionals have experienced positive health outcomes because of interprofessional teamwork and collaboration. Likewise, workplace parties that embrace visible, heartfelt leadership and shared values and encourage worker engagement are more likely to build healthy workplace cultures. These workplace cultures can be described as interdependent (i.e., mutually caring), proud of the workplace, and team-based, and they report low rates of occupational injury and disease, improved worker well-being, and world-class safety performance. Recognizing that health outcomes are influenced by both occupational and non-occupational environments, exposures, and conditions, collaboration inside the workplace and within the larger community presents direct opportunities for IH professionals to contribute, impact, or lead such efforts.

Corporate Social Responsibility

Corporate Social Responsibility (CSR) is a self-regulatory business model implemented globally by large and small organizations that establishes social accountability to the organization's stakeholders, including workers and members of the public. CSR provides a business model that supports environmental, social, and corporate governance

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(ESG). Many people are most familiar with the model's environmental aspects; however, human health and fair, ethical work practices are also integral to CSR. Organizations committed to CSR often take holistic approaches to the environment, communities, businesses, non-profits, and worker health and well-being. Occupational and non-occupational investments in health and positive outcomes in worker health are important CSR factors. There are opportunities for direct input by IH professionals and for partnership with other professionals to make meaningful CSR-related contributions in occupational and non-occupational settings.

Sustainability reporting and disclosure on ESG issues is increasing globally. Through sustainability reporting, organizations and their stakeholders communicate information about their contributions that have long-term value. Materiality analysis is a leading element of sustainability. In materiality analysis, metrics that typically focus on an organization's significant outward impacts on the economy, environment, and people, including human rights, are identified as important to the organization and its stakeholders. There are opportunities for IH professionals to have direct input into this aspect and to work with sustainability teams to consider TEH and TWH in the development of materiality surveys.

Responsible Business Decision-Making

Responsible business decision-making includes consultation with and input from professionals and experts, including IH professionals as exposure scientists, to make well-informed decisions. There are opportunities for IH professionals in leadership, corporate, team, and influencer roles to positively impact responsible business decision-making. This includes reporting, data interpretation, planning, and supporting those in positions of leadership who are responsible for making decisions related to health and well-being and occupational and non-occupational health investments and outcomes.

Supportive Managers, Supervisors, and Executives

There is a clear connection between establishing and receiving support from managers, supervisors, and executives in the successful implementation of a TEH or TWH approach, including the execution of an IH professional's responsibilities in establishing and delivering on this approach. The leadership and messaging provided by these parties impacts change, transitions, and outcomes in the workplace. Within this aspect, there are opportunities for IH professionals to make exposure-based inputs that equip and support managers, supervisors, and executives in understanding, developing, implementing, evaluating, and communicating the importance of TEH or TWH approaches and programs.

Training

IH professionals should develop and deliver, or supporting the delivery of, training in TEH and TWH. This includes defining and describing how TEH and TWH fit into an organization's management systems and overarching commitment to health and safety, personal well-being, mental health, and sustainability. IH professionals can best identify and communicate the important relationships between occupational and non-occupational health exposures and personal health outcomes. Opportunities for exposure-based input by IH professionals exist in this aspect through integrating TEH and TWH approaches into organizations' employee orientation, occupational health and safety, and human resources training programs.

Worker Recognition, Appreciation, and Respect

Worker recognition, appreciation, and respect are important elements in workplace culture and relationships, work performance, and health and safety excellence. By extension, the three elements in this aspect have significant impact on personal health and well-being. It is well documented that effectively demonstrating worker recognition, appreciation,

and respect helps organizations gain maximum performance from employees and bring out the best in people. IH professionals, as occupational health specialists, can provide leadership and support to workplaces in establishing interdependent health and safety cultures and realizing world-class health and safety performance. Within this aspect, there are opportunities for IH professionals to collaborate with other workplace stakeholders to establish meaningful goals and effective systems for worker recognition, appreciation, and respect as they relate to TEH and TWH.

Organization of Work

Adequate Breaks

When breaks from work tasks are taken in environments free of chemical, biological, physical, and ergonomic hazards, break times provide opportunities to reduce exposures to workers and minimize their risks of injury or illness. IH professionals can provide direct, exposure-based input to the aspect of adequate work breaks (which should last 15 minutes and be taken every four hours, along with lunch breaks), appropriate work break environments, the enforcement of adequate work breaks, and the impact of breaks on occupational exposures.

Comprehensive Resources

Access to, and maintenance of, comprehensive resources related to the organization of work is important to effective workplace design, workplace processes, hazard control, and the health of workers. With this aspect, IH professionals can fill support and possibly leadership roles to workplaces and stakeholders as they identify, audit, and establish such resources and related systems. For practicing IH professionals, access to comprehensive resources is also relevant because work organization can impact exposure risks and health outcomes. Comprehensive resources will enable IH professionals to thoroughly and comprehensively anticipate, recognize, evaluate, and recommend controls for mitigating exposure risks.

Fatigue, Burnout, Loneliness, and Stress Prevention

Fatigue, burnout, and loneliness have negative impacts on personal health and well-being, including by exacerbating existing injuries, illnesses, and disorders. Stress can be defined as a change that causes physical, emotional, or psychological strain. Each of these factors can impair workers' thought and judgment processes and increase their risk of injurious exposures to existing hazards as well as introduce new hazards to occupational and non-occupational settings. Fatigue is a recognized hazard that negatively impacts work performance and decision-making capabilities, can increase the risk of deleterious exposures to other hazards present, and can be difficult to manage, as recognizing it is often subjective. Fatigue can also impair the effectiveness of programs intended to address injury and illness prevention and hazard control. Burnout can result when workers experience extreme fatigue, poor work-life balance, and workplace factors such as extreme workloads, demanding shift patterns, inadequate organization of work timing and task activities, poor work design, insufficient resource availability, and high-risk work environments. Workers required to work alone or remotely can experience loneliness to an extent that they can experience negative effects on their personal health and well-being, their mental health. Stress can create feelings frustration, or inability to cope with a situation or circumstance.

IH professionals are trained to anticipate, recognize, evaluate, and control various workplace stressors. Because the factors of fatigue, burnout, loneliness, and stress are important considerations in assessing and promoting TEH and TWH, this aspect presents opportunities for IH professionals to contribute at every phase of prevention defined in industrial

hygiene; to have direct, exposure-based input; and to form meaningful partnerships and collaborations with other professionals. When collaborating with other specialists, IH professionals can have valuable contributions to preventing fatigue, burnout, loneliness, and stress.

Job Quality and Quantity

There is a direct relationship between job quality, job quantity, and potentially injurious exposures. Job quality takes into consideration wages, working conditions, benefits, career opportunities, and workplace culture. Job quantity—that is, the "amount" of work—affects workers' personal health and well-being because too much or, sometimes, too little work can cause stress and mental health issues in the workplace and home. As occupational health and safety programs should cover psychological health and safety and prevent psychological harm, a comprehensive occupational health and safety program addresses the improvement and maintenance of work life as it relates to job quality and quantity and the relationship between these issues and workers' personal health and well-being. IH professionals can have direct, exposure-based input into this aspect from the perspectives of work design; job, process, task, and prevention planning; and hazard anticipation, recognition, evaluation, and control. There are also opportunities for IH professionals to partner and collaborate with other professionals to promote a TEH approach regarding job quality and quantity.

Meaningful and Engaging Work

Meaningful work has purpose and embraces values and goals that are important to workers. It enables workers to develop relationships, be of service to others, have autonomy, demonstrate commitment and competence, overcome challenges, and experience achievement and self-realization. Assignment and performance of meaningful work and engagement with work aims and objectives can be important determinants of overall worker health and well-being. In the absence of meaningful work, workers are at a risk of experiencing depression, anxiety, stress, burnout, decreased physical health, and poor work engagement. While IH professionals can support work planning by providing data and information related to evaluating and mitigating workers' exposure risks, they do not have direct input into the establishment of meaningful and engaging work.

Safe Staffing

Safe staffing means that an organization supports employees to deliver safe, quality services in practical settings. Unsafe staffing practices, such as maintaining an insufficient number of staff members to carry out required work, can place workers at greater risk of injury and illness. By eliminating unsafe staffing practices and policies, employers can provide better services for all. There are opportunities for IH professionals to have direct, exposure-based input into several issues related to safe staffing, such as maintaining workers' fitness for duty, fatigue management, musculoskeletal disorder prevention, psychological health and safety, and supporting psychosocial well-being.

Work Intensification Prevention

Work intensification is a term for the increasing amount of effort that workers must put forth during a workday, often due to increased economic pressures and societal changes. Work intensification can also refer to increasing levels of quantitative workload over time. In both cases, work intensification arises from the increased need to complete more tasks within one working day, work at heightened speed, perform different tasks simultaneously, and reduce downtime. Work intensification is impacted by integrated occupational and non-occupational exposures. IH professionals can have direct, exposure-based input into work intensification prevention, as they are able to anticipate, recognize, eval-

uate, and recommend controls to mitigate exposure risks and can determine overall exposures by integrating occupational and non-occupational exposures. IH professionals can also partner and collaborate with other professionals and stakeholders to prevent exposures, examine exposure data, and develop prevention and control plans.

Work-Life Fit

The aspect of work-life fit promotes the creation of a better balance between the demands of a job and a healthy life outside of work. Occupational initiatives to improve work-life fit can include worker benefits, policies, and programs offering a wide range of services and opportunities. For example, workplaces can provide on-site childcare, emergency childcare assistance, seasonal childcare programs, elder care initiatives, referral programs for care services, flexible work arrangements, job sharing, parental and family leave, educational and community services leave, employee assistance, fitness membership and facilities, and seminars and workshops on health-related topics such as stress, nutrition, and smoking. While IH professionals do not take lead roles in establishing benefits programs or benefits policies, there are opportunities for IH professionals to work in collaboration with other professionals or workplace parties within this aspect as it relates to personal health and health outcomes. Specific areas in which IH professionals can have direct, exposure-based input include fitness-for-duty and fatigue management, as these factors influence overall occupational and non-occupational exposure risks and health outcomes.

Policies

Elimination of Bullying, Violence, Harassment, and Discrimination

Bullying is abuse and mistreatment of a person or group perceived as vulnerable. It can include actions or words that psychologically or physically injure, harm, or isolate someone; are intended to intimidate, offend, or humiliate; and are usually recurring. Workplace violence and harassment can be broadly defined as any act in which a person is abused, threatened, intimidated, or assaulted in his or her employment. Violence and harassment deprive people of their dignity, conflict with decent work, undermine equal opportunities, and threaten safe, healthy, productive work environments. With respect to workplace bullying, violence, and harassment, employers should develop and implement policies and prevention programs as well as complete workplace assessments to identify work-related factors that increase the risk of these behaviors.

Discrimination occurs when people are denied access to jobs and training or made to remain within jobs that offer lower pay as the direct result of their disability, ethnicity, indigenous or tribal status, race, religion, sex, sexual orientation, gender identity, political opinion, real or perceived HIV/AIDS status, or other factors. Discrimination is a basis for social exclusion, such as being denied equal access to opportunities and services, income inequality, and poverty, but may manifest as unfair treatment, harassment, denial of reasonable workplace changes, improper questions about personal information, or retaliation for seeking redress. In the workplace, discrimination undermines people's dignity, voice, and ability to feel included, engage, and participate.

While workplace bullying, violence, harassment, and discrimination negatively impact worker health, IH professionals do not have opportunities for direct, exposure-based input within this aspect. However, the negative human behaviours addressed in this aspect represent harmful stressors in occupational and non-occupational environments, and there are opportunities for IH professionals to partner and collaborate with stakeholders on the issue.

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Equal Employment Opportunity

The right to equality of opportunity and treatment in respect to employment and occupation is important to overcoming and preventing discrimination in the workplace. This requires the participation of workers' and employers' organizations and other stakeholders. However, the issue of developing and monitoring policies and programs to address equal employment opportunity does not present opportunities for IH professionals to have direct, exposure-based input or collaborate with other stakeholders.

Family and Medical Leave

Family and medical leave helps workers balance work and family responsibilities through the provision of unpaid leave, while typically continuing to receive other benefits, for certain family-related and medical reasons. It is one way to promote equal employment opportunities. However, this is not an issue that provides IH professionals with opportunities to have direct, exposure-based input or to partner or collaborate with other stakeholders.

Human and Natural Resource Sustainability

Human and natural resource sustainability is related to the aspect of CSR, mentioned above, which establishes social accountability to an organization's stakeholders, including workers and the public. Human health and the environment, including natural resources, are integral parts of CSR. Through enabling CSR and supporting organizations in committing to improved worker well-being and occupational health and safety, IH professionals have opportunities for direct, exposure-based input within this aspect. IH professionals may also partner and collaborate with other professionals to assess occupational and non-occupational investments in human and natural resource sustainability.

Information Privacy

As workplaces increasingly use personal or portable monitoring instruments and devices to evaluate and improve worker health and safety, the protection of personal and private information that organizations collect is a critical issue. Best management practices and, in some jurisdictions, laws prescribe the establishment of workplace policies that detail the types of information being collected, opportunities for workers to decline participation, the duration of time that data will be available for, and to whom the data belongs. These requirements can apply to personal biological indicator data and personal exposure sample results.

This issue is important because exposure assessment capabilities can include the continuous detection of agents and parameters found in both occupational and non-occupational settings. A key element of the issue is clarifying information privacy terms and access by stakeholders, including workers and managers, in relation to important data and information that can help to prevent injury and illness, promote well-being, and improve health. There are opportunities for IH professionals to have direct, exposure-based input into policies, programs, and systems established to address information privacy and personal data collection, storage, and use.

Judicious Monitoring of Workers and Biomonitoring Practices

In most cases, legislation drives biomonitoring of workers. However, biomonitoring workers raises legal and ethical concerns. Actions taken based on workers' biomonitoring results, such as removing them from work, pose difficult questions regarding labor relations and labor and discrimination laws. Situations are complicated even further when non-occupational exposures impact workers' biomonitoring outcomes. Policies and programs to address biomonitoring need to be developed and meticulously worded with input from health professionals, including IH professionals, and reviewed by legal counsel to verify appropriate actions, wording, and meaning. Clear, accurate, and routine communication that

aligns with privacy requirements can help promote positive interactions between workplace stakeholders with regards to biomonitoring. IH professionals have opportunities for direct input into policies, programs, and systems established to address biomonitoring and to collaborate with other professionals.

Optimizing Function and Return-to-Work

A return-to-work program considers any functional ability limitations of workers returning to their jobs after illness or injury to optimize their work function and provide them with safe, meaningful, and suitable work. These programs work towards the goal of supporting workers' return to jobs they held before their illnesses or injuries in the most timely manner possible. Occupational and non-occupational exposures impact the success of return-to-work plans. IH professionals can have direct, exposure-based input in this aspect and can anticipate, recognize, evaluate, and recommend controls to support optimizing function and return-to-work programs. IH professionals can also assist in identifying relevant non-occupational exposures that may impact workers' recovery and evaluate the integration of occupational and non-occupational exposures to determine overall exposure. Within this aspect, IH professionals may partner and collaborate with other professionals to prevent exposures, examine exposure data, and develop control plans.

Prevention of Stressful Job Monitoring Practices

Ergonomic, environmental, and biological job monitoring practices and their implementation can cause workers and other workplace stakeholders to experience stress. The stress could be related to inappropriate communication between stakeholders; evidence of non-compliance; fear of evaluation or discipline; task or job elimination, or impending workplace change; discomfort with being watched; misunderstanding the goals of job monitoring; concern about questions related to lifestyle and other non-occu-

pational factors; or many other reasons. There are opportunities for IH professionals to have direct, exposure-based input into the development of necessary, appropriate, fair, and respectful job monitoring programs and systems and to collaborate with other professionals regarding this aspect.

Reasonable Accommodations

Reasonable accommodations enable disabled people who have adequate job qualifications to perform essential job functions and receive equal employment opportunities through changes that address hiring processes, jobs themselves, the ways jobs are performed, or work environments. "Reasonable" means that the accommodations do not cause hardship or pose direct threats to workers. Providing reasonable accommodations for disabled people supports the mitigation of exposure risks and hazards and improves job quality, potential health outcomes, and personal well-being. There are opportunities for IH professionals to have direct, exposure-based input into the policies, programs, and systems established to address reasonable accommodations and to collaborate with other professionals regarding exposures and support systems potentially impacting accommodations.

Transparent Reporting Practices

Transparent reporting practices related to TWH and TEH include disclosing relevant data, records, and content that support legislative compliance and organizational commitments to workers and other stakeholders. IH professionals hold key roles in data collection, interpretation, record keeping, and reporting as these programs relate to occupational health and safety. There are opportunities for IH professionals to have direct, exposure-based input into the policies, programs, and systems established to address reporting practices and to collaborate with other professionals regarding this aspect.

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Whistleblower Protection

A whistleblower is an individual who exposes information or activities within a private or public organization that are deemed illegal, unethical, or incorrect. Globally, different jurisdictions have legislation with provisions for protecting whistleblowers. However, IH professionals do not have opportunities for direct, exposure-based input or collaboration or partnership with other professionals within this aspect.

Worker Well-Being Centered

Being worker well-being centered involves taking a holistic approach that generally encompasses workers' physical, mental, and social health or well-being. Physical health includes biological and physical needs and safety as well as fitness, comfort, nourishment, and environmental well-being. Mental health includes security, cognitive needs, self-esteem, self-actualization, and cognitive and emotional well-being. Social health and well-being include a sense of belonging and appreciation. A worker well-being centered approach recognizes that factors impacting these elements are present and evolving in occupational and non-occupational environments. There are opportunities for IH professionals to have direct input into policies, programs, and systems established to address this aspect and to collaborate with other professionals.

Workplace Supported Recovery Programs

Workplace supported recovery programs use evidence-based policies and programs to reduce risk factors contributing to substance abuse. Typically, a recovery-supporting workplace establishes policies and programs that remove barriers to seeking and receiving care and maintaining recovery. There are significant education components for workplace parties with regards to substance use disorders. The aims of supported recovery programs include reducing risk factors, such as by preventing work-related injuries and illnesses that may lead to substance misuse; enabling second-chance employment; providing accommodations, return-to-work programs, and coaching; and preventing substance misuse from progressing to substance use disorders. Both occupational and non-occupational settings may contain risk factors and opportunities for supported recovery. IH professionals may have direct input into policies, programs, and systems related to workplace supported recovery programs and can collaborate with other professionals regarding this aspect.

Technology

Artificial Intelligence

Workplaces are now collecting and storing streams of data for predictive and worker protection purposes, often through direct-reading instruments (DRIs) equipped with personal portable sensors. Workplace exposures can be assessed and predicted using this data and artificial intelligence (AI) technology, and the ability to continuously sense and measure environment parameters can be extended to non-occupational settings. Although these expanding exposure assessment capabilities face challenges related to data privacy and stakeholder acceptance, AI supported by Big Data is relevant to TEH, effective predictive analysis, exposure control, and, ultimately, disease and injury prevention. This aspect provides opportunities for IH professionals to have direct, exposure-based input and to partner and collaborate with other workplace and community professionals, including those who set policies for data privacy, data ownership, and the use of AI for health protection.

Robotics

Robots now perform tasks traditionally conducted by people in industries around the world. Applied robotics has been effective in eliminating many exposures, such as those associated with work in hazardous environments or potentially injurious repeti-

tive tasks. This aspect provides opportunities for IH professionals to partner and collaborate with other professionals and provide support in identifying control opportunities.

Sensors

The evaluation of occupational and non-occupational exposures often requires the use of sensor technologies that can detect changes in environmental or biological variables and can accurately and reliably measure select parameters. For example, sensors may measure temperature, pressure, or humidity. Sensor characteristics should also include resolution, linearity, zero drift and full-scale drift, range, repeatability, and reproducibility. In addition, sensor speed is important for appropriate data collection and establishing exposure profiles. While IH professionals do not have input into sensor design, this aspect provides opportunities for IH professionals to partner and collaborate with other professionals to provide support in selecting, applying, using, and operating instruments with appropriate sensor capabilities and interpreting the resulting data sets and recommendations.

Work Arrangements

Contracting and Subcontracting

Contract and subcontract workers perform work for one company but may be self-employed or employed by a different company. Often, contractors and subcontractors perform work that presents high or extreme risks of exposure to occupational hazards that include work at heights, asbestos abatement, waste management, entering confined spaces, and emergency response. Their workplaces are often also dynamic, presenting challenges for exposure profiling and assessment and the evaluation of controls. Mitigating risks associated with contracting and subcontracting work arrangements, including risks to the health and safety of workers and the public, requires

written work agreements with terms and conditions specific to potential and actual circumstances. Diligent management of work arrangements under agreed-upon terms and conditions is also necessary. Contracting and subcontracting agreements should specify compliance with health and safety legislation; the health and safety requirements of the workplace, organization, or employer; and requirements pertaining to work scope, work conditions, worker training, and emergency response. IH professionals have opportunities for direct, exposure-based input by providing leadership and support to organizations, contractors, and subcontractors through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards. There are also opportunities for IH professionals to partner and collaborate with other professionals within this issue.

Freelance

In freelance work arrangements, individuals work for different companies at different times or work for multiple employers within the same time period. Many freelancers are professionals who sell services instead of products. Freelance work arrangements raise concerns related to worker and public health and safety similar to those established for contracting and subcontracting. IH professionals have opportunities for direct, exposure-based input by providing leadership and support to organizations and freelance workers through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards. There are also opportunities for IH professionals to partner and collaborate with other professionals with regards to this issue.

Global and Multinational

For global and multinational organizations, mitigating occupational health and safety risks presents challenges in compliance and applying best practices. Legislation requirements in jurisdictions

around the world can vary greatly, as can working conditions, work performance, and the risk perception and tolerance of working populations, cultures, and communities. Workers employed by global and multinational organizations may also be required to travel extensively and work in new, changing, or extreme environments, such as those that compromise personal and medical security; expose workers to physical, mental, and emotional stressors; or involve remote work. Job requirements associated with working for global and multinational organizations can create vulnerabilities for workers that impact their health, safety, personal well-being, and fitness for duty, such as fatigue, stress, isolation, travel, and changing medical service availability. IH professionals have opportunities for direct, exposure-based input into the policies, programs, and systems of global and multinational organizations and to collaborate with other professionals within this aspect, in relation to TEH and TWH, the integration of occupational and non-occupational exposures, and improved health outcomes.

Multi-Employer

Multi-employer work arrangements can be found in traditional sectors, such as construction, and in association with web platforms that outsource jobs to individuals. Multi-employer work arrangements often center around a transient workforce with atypical employment patterns; dynamic work conditions, terms, and locations; and the presence of subcontracted workers. As with sites employing contractors and subcontractors, sites with multiple employers often involve work that presents high or extreme risk of exposure to a broad range of occupational hazards. These arrangements present potential risks to worker and public health and safety that multiple employers may have concurrent responsibilities to manage or mitigate, requiring diligent management and clear written agreements with terms and conditions specific to potential and actual circumstances.

As with contractors, subcontractors, and freelancers, multi-employer agreements should specify compliance with health and safety legislation; the health and safety requirements of workplaces, organizations, or employers; and requirements pertaining to the work scope, work conditions, worker training, and emergency response. IH professionals have opportunities for direct, exposure-based input by providing leadership and support to parties involved in multi-employer work arrangements through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards and possibly implementing TEH and TWH programs. IH professionals may also partner and collaborate with other professionals with regards to this issue.

Nonstandard

"Nonstandard forms of employment" refer to employment arrangements deviating from standard employment, including temporary employment, part-time, on-call, and temporary agency work. Changes in technology and labor market regulations have resulted in an increase in nonstandard forms of employment in the last twenty years. This raises concerns related to working conditions, performance-driven work, and the overall health and well-being of workers employed through nonstandard arrangements. IH professionals have opportunities for direct, exposure-based input into policies, programs, and systems related to nonstandard work arrangements and to collaborate with other professionals within this aspect, as it relates to TEH and TWH, the integration of occupational and non-occupational exposures, and improved health outcomes.

Organizational Restructuring, Downsizing, and Mergers

Changes associated with organizational restructuring, downsizing, and mergers can potentially cause high levels of mental and emotional stress for workers and other stakeholders. Stress may result from

lost income, increased occupational exposures, increased workload required of remaining workers, and job insecurity. IH professionals have opportunities for direct, exposure-based input into policies and programs related to organizational restructuring, downsizing, and mergers and to collaborate with other professionals within this aspect, as it relates to anticipating and recognizing occupational and non-occupational exposures, stress prevention, and improved health outcomes.

Precarious and Contingent

Precarious employment typically refers to work that is poorly paid and generally unregulated. Contingent employment is typically contract work that occurs on a temporary or as-needed basis and is often part-time. Both precarious and contingent employment arrangements lack job security. Anxiety and stress may result from the uncertainty of continued employment and income and the absence of regulation. IH professionals have opportunities for direct, exposure-based input into policies and programs related to precarious and contingent work arrangements and to collaborate with other professionals within this aspect, as it relates to anticipating and recognizing occupational and non-occupational exposures, harm prevention, and improved health outcomes.

Small and Medium-Sized Employers

The unique characteristics of small and medium-sized employers can significantly impact their workplace cultures, approaches to occupational health and safety, and health and safety performance. It is well documented that small workplaces have higher fatality rates than large workplaces. In general, small and medium-sized employers do not always have access to the human or financial resources that would support their understanding and management of occupational and non-occupational exposures and health outcomes. In small and medium-sized workplaces, high risk tolerance—possi-

bly due to lack of financial stability and the need for work—combined with low risk perception—such as lack of training and limited abilities to anticipate and recognize hazards or their severity—can put workers at greater risk of injury or illness. IH professionals can have direct, exposure-based input into the development of policies, programs and tools that small and medium-sized employers can use to anticipate, recognize, evaluate, and control exposures in occupational and non-occupational settings. IH professionals may also partner and collaborate with other professionals and stakeholders to prevent exposures and promote TEH and TWH approaches for small and medium-sized employers.

Temporary

Temporary work arrangements, colloquially referred to as "temp" employment, often create conditions where individuals work for different organizations at different times. Temp workers are hired through staffing agencies that connect them with organizations in need of workers, as opposed to contractors and subcontractors, who may be employed by a secondary business entity, or freelancers, who tend to work alone. Temporary work arrangements raise worker health and safety concerns similar to those established for contracting, subcontracting, and freelance work arrangements. This issue presents opportunities for IH professionals to have direct, exposure-based input by providing leadership and support to organizations, temporary work agencies, and temporary workers through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards. This issue also provides IH professionals with opportunities to partner and collaborate with other professionals.

Unemployment and Underemployment

Unemployed persons do not have a job, have actively looked for work in the prior four weeks, and are currently available for work. Underemployed perso-

na are those working part time for economic reasons, such as slack demand for work, poor business conditions, or an inability to find a full-time job. They usually want and are available for full-time work but work part time. IH professionals do not have direct, exposure-based input into this aspect.

Virtual

Virtual work arrangements present unique risks to individuals working from home or in locations remote to their workplace establishments. Concerns related to the health and safety of workers in virtual arrangements include isolation, lack of separation between home and work lives, distractions from their families, excessive work hours, less communication with employers and other stakeholders, reduced sense of community, stress related to being overlooked and possibly unsupported by leadership, and stress due to over-management and heightened levels of accountability reporting. Virtual work arrangements may also be associated with ergonomic hazards related to poor or incorrect workstation setups. Collective exposure to these stressors and hazards can negatively impact personal health and well-being and exacerbate existing injuries, illnesses, and disorders. Impairment may also introduce new hazards to occupational and non-occupational settings, such as fatigue, burnout, and isolation. Additionally, supervisors and managers may be unable or have limited ability to anticipate or recognize when virtual work arrangements have deleterious impacts on individual workers. As IH professionals are trained in anticipating, recognizing, evaluating, and controlling of workplace hazards and stressors, they have opportunities for direct, exposure-based input into policies and programs for virtual work arrangements and to partner and collaborate with other professionals to mitigate exposure risks, prevent stress, and improve health outcomes.

Workforce Demographics

Diversity and Inclusivity

Employers establishing and implementing policies and programs to promote workplace diversity and inclusivity create opportunities to build and maintain workplace cultures based on employee trust and commitment. A diverse, inclusive workplace enables all stakeholders to feel a sense of belonging and to engage in workplace commitments, such as to promoting worker health and safety and prevent harm to workers. Moreover, knowing and understanding workforce demographics are important to exposure science from the perspectives of hazard anticipation, recognition, evaluation, and control. This aspect provides opportunities for IH professionals to have direct, exposure-based input when establishing and monitoring occupational hygiene and risk management cycles. There are also opportunities for IH professionals to partner and collaborate with other professionals to review, discuss, and evaluate workforce demographics with views toward improving occupational and non-occupational health outcomes.

Multigenerational

In a multigenerational workforce, the staff complement is made up of people from several generations. Currently, there are four or five generations represented in U.S. workplaces, including Generation Z (born 1997–2012), Millennials (1981–1996), Generation X (1965–1980), Baby Boomers (1946–1964), and the Silent Generation (1928–1945). As individuals have extended their work lives beyond the typical age of retirement at 65, the diversity of ages in the workforce has increased. Managing a multigenerational workforce presents challenges in worker health and well-being and managing the impact of occupational and non-occupational exposures. Leading and supporting multigenerational workforces requires appropriate and flexible communication; acknowledgment of different risk perceptions, risk tolerances, and work practices; and respect for different and

varied perspectives. IH professionals have opportunities for direct, exposure-based input by providing leadership and support to organizations with multigenerational workforces through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards. Within this aspect, there are also opportunities for IH professionals to partner and collaborate with other professionals in establishing TEH and TWH approaches.

Productive Aging Across Lifecourse

The concept of productive aging across the lifecourse places importance on individuals' health, safety, and well-being across their entire work lives, from their first to last days on the job. Generally, there are four key elements to supporting productive aging in the workplace: a lifespan perspective, an integrated occupational health and safety approach, an emphasis on positive outcomes for workers and organizations, and a work culture that supports a multigenerational workforce. By remaining in the workforce longer, individuals can potentially increase their income and savings for retirement and potentially improve their health outcomes. Challenges to supporting productive aging across workers' lifecourses include increased incidences of chronic health conditions and higher probability of occupational injury or illness among older workers. However, these risks can be managed with appropriate productive aging and work programs that offer support in the workplace, community, and home, with the potential benefit of increasing workers' longevity and productivity. IH professionals have opportunities for direct, exposure-based input in supporting organizations' establishment of policies and programs that address productive aging, including by anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards. With regards to this issue, there are also opportunities for IH professionals to partner and collaborate with other professionals in establishing TEH and TWH approaches.

Vulnerable Workers

Vulnerable workers include workers who are 25 years of age and younger, new to the workforce, approaching the age of retirement, are migrants or immigrants, have temporary worker status, or are returning to work following an extended absence, such as from parental or medical leave. Vulnerable workers are at a greater risk of occupational injury and illness compared to other subgroups of workers due to exposure to high-risk job hazards, lack of training and experience, limited support from employers, lack of awareness of occupational health and safety hazards, high risk tolerance, and lack of empowerment to refuse unsafe work. IH professionals have opportunities for direct, exposure-based input by providing leadership and support for organizations and vulnerable workers through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards and to partner and collaborate with other professionals to establish TEH and TWH approaches.

Workers with Disabilities

In workplaces with insufficient policies, prevention and control programs, and worker empowerment, disabled workers are at increased risk of exposure to occupational hazards. By law, employers are responsible for providing healthy and safe conditions for all workers, including the duty to accommodate disabled workers. When employing disabled workers, employers may be required to establish additional risk mitigating and control measures. Providing reasonable accommodations for disabled workers supports the mitigation of exposures to hazards and improves job quality, potential health outcomes, and personal well-being. IH professionals to have opportunities for direct, exposure-based input by providing leadership and support to organizations and disabled workers through anticipating, recognizing, evaluating, and controlling occupational and non-occupational hazards and to partner and collaborate with other professionals in establishing TEH and TWH approaches.

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Using *Total Worker Health*® Approaches

Prevention and Control of Hazards and Exposures
- Biological Agents
- Chemicals
- Ergonomic Factors
- Physical Agents
- Psychosocial Factors
- Risk Assessment and Management

Built Environment Supports
- Accessible and Affordable Health Enhancing Options
- Clean and Equipped Breakrooms, Restrooms, and Lactation Facilities
- Healthy Workspace Design and Environment
- Inclusive and Universal Design
- Safe and Secure Facilities

Community Supports
- Access to Safe Green Spaces and Pathways
- Healthy Community Design
- Safe and Clean Environment (Air and Water Quality, Noise Levels, Tobacco-Free)
- Safe, Healthy, and Affordable Housing Options
- Transportation and Commuting Assistance

Compensation and Benefits
- Adequate Wages and Prevention of Wage Theft
- Affordable, Comprehensive, and Confidential Healthcare Services
- Chronic Disease Prevention and Management Programs
- Continual Learning, Training, and (Re-)Skilling Opportunities
- Disability Insurance (Short- and Long-Term)
- Employee Assistance and Substance Use Disorder Programs
- Equitable Pay, Performance Appraisals, and Promotions
- Minimum Guaranteed Hours
- Paid Time Off (Sick, Vacation, Caregiving, Parental)
- Prevention of Healthcare Cost Shifting to Workers
- Retirement Planning and Benefits
- Work-Life Programs
- Workers' Compensation Benefits

Healthy Leadership
- Collaborative and Participatory Environment
- Corporate Social Responsibility
- Responsible Business Decision-Making
- Supportive Managers, Supervisors, and Executives
- Training
- Worker Recognition, Appreciation, and Respect

Organization of Work
- Adequate Breaks
- Comprehensive Resources
- Fatigue, Burnout, Loneliness, and Stress Prevention
- Job Quality and Quantity
- Meaningful and Engaging Work
- Safe Staffing
- Work Intensification Prevention
- Work-Life Fit

Policies
- Elimination of Bullying, Violence, Harassment, and Discrimination
- Equal Employment Opportunity
- Family and Medical Leave
- Human and Natural Resource Sustainability
- Information Privacy
- Judicious Monitoring of Workers and Biomonitoring Practices
- Optimizing Function and Return-to-Work
- Prevention of Stressful Job Monitoring Practices
- Reasonable Accommodations
- Transparent Reporting Practices
- Whistleblower Protection
- Worker Well-Being Centered
- Workplace Supported Recovery Programs

Technology
- Artificial Intelligence
- Robotics
- Sensors

Work Arrangements
- Contracting and Subcontracting
- Free-Lance
- Global and Multinational
- Multi-Employer
- Non-Standard
- Organizational Restructuring, Downsizing, and Mergers
- Precarious and Contingent
- Small- and Medium-Sized Employers
- Temporary
- Unemployment and Underemployment
- Virtual

Workforce Demographics
- Diversity and Inclusivity
- Multigenerational
- Productive Aging across Lifecourse
- Vulnerable Workers
- Workers with Disabilities

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