An Expanded Focus for Occupational Safety and Health

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Disclaimer: The findings and conclusions in this report are those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health.
We know the world of work is undergoing major changes.
In the nature of work
Profound Changes in the Occupational World

• Work
  • Physical → Mental
  • Production → Service
  • Production → Health Care

• New ways of organizing
  Contracting
  Downsizing
  Lean manufacturing

• Work intensification

(Stone 2004; Cappelli and Keller 2013; Eurofound 2015; Howard 2017)
In the composition of workforce
Profound Changes in the Occupational World (cont’d)

- Workforce
  - Older workers
  - More immigrants
  - More women
  - More veterans
  - Multigenerational
  - More turnover
  - Less unionization
  - More chronic disease

Cost Burden of Chronic Disease

DeVol & Bedroussian 2007
Forgone Economic Output Due to Chronic Disease

DeVol & Bedroussian 2007
In the types of workplaces
Profound Changes in the Occupational World (cont’d)

• Workplace
  • More small businesses
  • More telecommuting
  • New work plans
  • New work conditions
  • New work contracts

While we have new hazards, we also must deal with older deadly ones.

The workplace is a mosaic of hazards.
Transition

Recognizing occupational hazards

Comprehensive view of the burden of work and work-related adverse effects
Figure 1. Burden: Comprehensive View

Worker
- Disability
- Economic loss (long-term earnings)
- Living and working with pain
- Loss of contribution to community life
- Loss of opportunities
- Emotional impact
- Anger

Community
- Economic losses
- Community strain
- Inability of residents to function

Worker’s Family
- Economic losses
- Loss of ability to perform family and social roles
- Depression
- Anxiety
- Impaired relationships
- Divorce

Employer
- Direct medical costs
- Vocational rehab expenses
- Pensions and wage-replacement
- Indirect costs (productivity)
  - Production interruption
  - Accident investigation
  - Recruiting and training replacement

Society
- Percent of GDP
- Workers compensation costs borne by medical insurance
- Higher consumer prices
- Productivity
- Loss of human capital
- Work-related costs in private insurance
- Instability due to large numbers of precarious workers

(Schulte et al 2017)
Need for an expanded focus for occupational safety and health

• Broader “horizontally”
• Broader “vertically”
An Expanded Focus for Occupational Safety and Health (OSH)

Broader horizontally

Current

OSH

Personal Risk Factors

OSH

Social & Economic Risk Factors

Broader horizontally and vertically

Working Life Continuum

Personal Risk Factors

Well-being

OSH

Social & Economic Risk Factors
Relation of work and workplace hazards to disease and injury

**Occupational Disease and injury**
- Primarily caused by chemical, physical, biological, and psychosocial factors in the workplace
- Attributable fraction (AF)
  \[ AF > 50\% \]

**Work-related disease and injury**
- Diseases in the working population in which the work environment and the performance of work contribute significantly but as one of a number of factors to the causation of disease.
  \[ AF < 50\% \]

WHO (2003)
Broader consideration of the role and impact of work

• Many of the most prevalent and significant health conditions in workers not caused solely by workplace hazards
  - Examples include stress-related conditions, cardiovascular, psychological, and musculoskeletal disorders, obesity, depression, substance abuse, and violence

• Separation of “work” and “non-work” is in some ways artificial
  - Due to labor or employment contract
  - Compartmentalization leads to under-reporting
  - Increasing porous boundaries between work and home
Broader Horizontal Focus

A useful way to think of work and nonwork factors related to workers comes through consideration of four heuristic conceptual models.

[Schulte et al. 2012; Pandalai et al. 2013]
Interaction of Occupational and Personal Risk Factors in Workforce Health and Safety

Paul A. Schulte, PhD, Suchao Pandelaki, MD, Victoria Wulkin, MD, and Heeyoung Chun, ScD

Most diseases, injuries, and other health conditions experienced by working people are multifactorial, especially as the workforce ages. Evidence supporting the role of work and personal risk factors in the health of working people is frequently underused in developing interventions. Achieving a longer, healthy working life requires a comprehensive preventive approach. To help develop such an approach, we evaluated the influence of both occupational and personal risk factors on workforce health. We present 32 examples illustrating 4 combinatorial models of occupational hazards and personal risk factors (genetics, age, gender, chronic disease, obesity, smoking, alcohol use, prescription drug use). Models that address occupational and personal risk factors and their interactions can improve our understanding of health hazards and guide research and interventions. (Am J Public Health. 2012;102:434–448. doi:10.2105/AJPH.2011.300249)

effectiveness of health protection and health promotion interventions. Specific problem-driven research focuses on a marginal effect that is averaged over the other risk factors in a given context. Such problem-driven research, although beneficial in understanding a specific risk factor, has led to a lack of comprehensive research on the combined role of PRFs and occupational risk factors (ORFs) in work-related illness and injury. ORFs and PRFs are not only potential confounders or effect modifiers of associations of each risk factor with disease, but they may also be on

(Schulte et al 2012)
Model 1: Additive Interaction

- Occupational Risk Factor
- Personal Risk Factor
- Disease, Death, or Injury Effect
Example: Additive Interaction

- Work-Related Psychosocial Factors
- Age
- Musculoskeletal Disorders
Model 2: Effect Modification by Personal Risk Factor

- Personal Risk Factor
- Occupational Risk Factor
- Disease, Death, or Injury Effect
Example: Effect Modification by Personal Risk Factor

**NAT2 Genotype**

Aromatic Amines \[\rightarrow\] Bladder Cancer
Model 3: Effect Modification by Occupational Risk Factor

Occupational Risk Factor

Personal Risk Factor

Disease, Death, or Injury Effect
Example: Effect Modification by Occupational Risk Factor

Use of ladders

Opioids and benzodiazepine use

Falls
Model 4: Separate Pathway Interactions

Occupational Risk Factor → Disease, Death, or Injury Effect$_1$

Personal Risk Factor → Disease, Death, or Injury Effect$_2$
Example: Separate Pathway Interactions

Noise → Hypertension

Smoking → Coronary Heart Disease
Consider the social context of occupational injuries and illnesses

(Dembe, 2001)
An Expanded Focus for Occupational Safety and Health (OSH)

Current

Broader horizontally

OSH

Personal Risk Factors

OSH

Social & Economic Risk Factors

Broader horizontally and vertically

Working Life Continuum

Personal Risk Factors

OSH

Social & Economic Risk Factors

Well-being
Broader Vertical Longitudinal Focus: Working Life Continuum

• Occupational and work-related illnesses and injuries need to be seen within the context of “working life”:
  - The continuum from pre-work to post-work
  - Dynamic and blended working life
The Dynamic Nature of Work

NON-WORK HAZARDS AND RISKS

Working Life

JOB N

Occupational hazards and risks

Work-related hazards and risks

Underemployed

• Unemployed
• Between jobs
• Job “churning”
• Precarious employment

JOB 1

Occupational hazards and risks

Work-related hazards and risks

Underemployed

Pre-work (school/training)

Post-work (retirement)
Jobs in a lifetime

BLS (2015)

ages 18-48: 11.7 (avg.)

Spells of unemployment

BLS (2015)

ages 18–48 (avg.) 5.6
high school dropout 7.4
high school graduate 5.6
college graduate 3.9
Health Effects of Unemployment

- Physical and mental

- Jobs loss increases odds of fair or poor health by 54%

- Job loss increases odds of new health conditions by 83% among those with no pre-existing conditions

Strully (2015)
Underemployment

Not having enough adequately paid work or not doing work that makes full use of a worker’s skills or abilities

Four types of underemployment

- hours based
- income based
- skill based
- status based

Friedman and Price (2003)
Underemployment seems to have health effects more like those of unemployment than adequate employment.

Dooley and Catalano (1991)
Health Burden Within and Between Jobs

- JOB 1
  - Employment
  - Under employment

- JOB 2
  - Employment
  - Under employment

- JOB N
  - Employment
  - Under employment

Health effects

Cumulative health effects?
An Expanded Focus for Occupational Safety and Health (OSH)

Current

Broader horizontally

Working Life Continuum

Broader horizontally and vertically

Personal Risk Factors

OSH

Social & Economic Risk Factors

Well-being

Personal Risk Factors

OSH

Social & Economic Risk Factors
Consider “well-being” in the expanded focus

• Aspiring to a good life
• Flourishing
• Characterized by happiness, life satisfaction, positive emotion, self-determination
• Includes health, but goes beyond it
• Related to individual, enterprise, and national productivity

(Pot 2017; Schulte et al 2015)
Well-being (variously defined) is linked to

• Lower healthcare costs
• Reduced injury
• Reduced illness
• Lower ratio of absenteeism and presenteeism
• Worker and enterprise productivity
Considerations for Incorporating “Well-Being” in Public Policy for Workers and Workplaces

Action to address workforce functioning and productivity requires a broader approach than the traditional scope of occupational safety and health. Focus on “well-being” may be one way to develop a more encompassing objective. Well-being is widely cited in public policy pronouncements, but often as “... and well-being” (e.g., health and well-being). It is generally not defined in policy and rarely operationalized for functional use. Many definitions of well-being exist in the occupational realm. Generally, it is a synonym for health and a summative term to describe a flourishing worker who benefits from a safe, supportive workplace, engages in satisfying work, and enjoys a fulfilling work life. We identified issues for considering well-being in public policy related to workers and the workplace. (Am J Public Health. 2015;105:e31–e44. doi:10.2105/AJPH.2015.302616)
Worker Well-Being:

Worker well-being is 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 in other areas of life that enables workers to thrive and achieve their full potential.

(Chari et al 2018)
An Expanded Focus for Occupational Safety and Health (OSH)

Traditional OSH skill sets
Occupational Medicine & Nursing
Industrial Hygiene and Epidemiology
Ergonomics
Engineering
Occupational Psychology
Law

New Skill Sets
Economics, Sociology, Anthropology, Human Relations, Gerontology,
Informatics, Education, Corporate Social Responsibility, Sustainability

Working Life Continuum
Well-being
Ethical, legal, social issues

• Employer is responsible for health and safety in the workplace
• Thinking about non-work factors that affect worker is a slippery slope

• Potential to blame worker
• Need to identify overlapping responsibilities for worker well-being
Conclusion

• Protecting the workforce of today and the future requires taking a holistic view of the hazards they experience and the range of adverse effects that result.

• The occupational safety and health focus should be expanded and new skill sets integrated into it.
Thank You

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