Expanded Focus for Occupational Safety and Health: A paradigm shift

Sarah A. Felknor, DrPH and Paul Schulte, PhD

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The world of work is undergoing profound changes.

Changes in the nature of work
Traditional vs. non-standard work arrangements

- Traditional one employer over a lifetime career thing of the past
- Increase in alternative or non-standard work arrangements
  - Contingent, temporary, part-time, contract, and ‘gig’ arrangements
  - Lack of permanence and loss of legal protections for a safe workplace
  - Considered flexible work for employers and precarious work for workers
- 30% of all establishments use alternative work arrangements
- Contingent workers represent 30% of the workforce
  - Highest among Hispanic or Latino ethnicity
  - Lower paid than same educational level among permanent employed
  - Few or no benefits

[Capelli and Keller 2013; BLS 2017; Howard 2017, Cummings and Kreiss 2008]

Risk of non-standard work arrangements

- Evidence that work arrangement may put workers health at risk
  - “Irregular, unstable, temporary or precarious working conditions common to what is usually known as informal work in developing countries” [Siqueira 2016]
- Non-standard arrangement shifts risk of doing business to worker
- Manner by which work arrangements may increase risk is not known

[Siqueira 2016, Howard 2017]
**Work organization and intensification**

- New ways of organizing
  - Contracting
  - Downsizing
  - Lean manufacturing
- Work intensification
  - Designed to increase productivity
  - Technology driven
  - More work and less recovery time
  - Correlates with psychological distress

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Changes in the nature of work bring new and unknown workplace exposures and risks that may affect workers’ health disproportionately.
Changes in the workforce

- Multigenerational
- More turnover
- Less unionization
- More chronic disease

- Older workers
- More immigrants
- More women
- More veterans
Total economic impact of chronic disease $1.3 Trillion, 2003

US$ Billions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Total Treatment Expenditures</th>
<th>Total Lost Economic Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>$14</td>
<td>$22</td>
</tr>
<tr>
<td>Diabetes</td>
<td>$27</td>
<td>$105</td>
</tr>
<tr>
<td>Pulmonary...</td>
<td>$45</td>
<td>$94</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>$65</td>
<td>$105</td>
</tr>
<tr>
<td>Mental Disorders</td>
<td>$46</td>
<td>$171</td>
</tr>
<tr>
<td>Hypertension</td>
<td>$33</td>
<td>$280</td>
</tr>
<tr>
<td>Cancers</td>
<td>$48</td>
<td>$271</td>
</tr>
</tbody>
</table>

Lost productivity due to chronic disease $ 1046.7 Billion, 2003

US$ Billions

- Presenteeism Individual - $828.2
- Presenteeism Caregiver - $80.2
- Lost Workdays Individual - $127.5
- Lost Workdays Caregiver - $10.8

[DeVol & Bedroussian 2007]
Forgone economic output due to chronic disease, 2005 – 2050

Changes in the workforce challenge traditional health and safety systems to ensure a safe and healthy workforce.
Changes in the workplace

More small businesses
- Majority of businesses across all sectors in U.S.
- Employ disproportionate number of workers in high risk sectors

More telecommuting
New work conditions
New work plans
New work contracts
The workplace is a mosaic of hazards

- Changes in work, the workforce, and the workplace bring new hazards and risks
- While we still face older deadly hazards and risks

Transition

Traditional OSH approach recognizing hazards and eliminating associated risks

Comprehensive view of the burden of work and work-related adverse effects
Traditional OSH paradigm

- Traditional OSH paradigm involves the identification and elimination of risks associated with work
- Occupational health surveillance systems are largely injury focused and don’t adequately capture occupational disease
- Historically narrow view of OSH injury and illness with emphasis on injury
- Results in underestimated and under-recognized burden of workplace injury, illness, and disability

Comprehensive view of work-related burden

- Multiple domains of burden
  - Individual worker – workers’ family – community – employer – society
- Broader view of work-relatedness of disease and injury
  - Occupational injury and illness
  - Work-Related injury and illness
- Impact over the entire working life continuum
  - Considers occupational and work-related burden over a lifetime including periods of unemployment
- Concept of well-being as a more comprehensive indicator
  - Challenge of lack of consensus of how to define and apply
A paradigm shift is needed to an expanded focus for occupational safety and health.

Broader view of burden vertically and horizontally
Multiple domains of burden

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

Broader view 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
  - Increasingly porous boundaries between work and home
- Need for broader consideration of interaction of work and non-work factors
**Occupational Disease and Injury**

- Morbidity, mortality, and injury
- Primarily caused by chemical, physical, biological, and psychosocial factors in the workplace
- Single identifiable and measurable exposure in the workplace
- Example: mesothelioma and coal miners’ pneumoconiosis
- Directly attributable to a workplace exposure to asbestos and coal dust

**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.
- Causation of new or aggravation of existing disease of non-occupational origin
- Example: musculoskeletal disorders

**Expanded Focus Broader Vertically**

![Diagram showing a broader focus on occupational health and safety (OSH) including personal risk factors, social & economic risk factors, and well-being.](wellbeing)
Expanded Focus Broader Vertically

Current

OSH

Broader horizontally

OSH

Personal Risk Factors

Social & Economic Risk Factors

OSH

Personal Risk Factors

Social & Economic Risk Factors

Well-being

Broader horizontally and vertically

Working Life Continuum

The working life continuum and dynamic nature of work

NON-WORK HAZARDS AND RISKS

Working Life

Pre-work (school/training)

JOB 1

Occupational hazards and risks

Work-related hazards and risks

JOB N

Occupational hazards and risks

Work-related hazards and risks

Post-work (retirement)

• Unemployed
• Between jobs
• Precarious employment
### Number of jobs in a lifetime

**Born between 1957 – 1965**

<table>
<thead>
<tr>
<th>Ages 18 – 48</th>
<th>11.7 jobs (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>11.8 jobs</td>
</tr>
<tr>
<td>Women</td>
<td>11.5 jobs</td>
</tr>
<tr>
<td>27% cohort</td>
<td>15 jobs or more</td>
</tr>
<tr>
<td>10% cohort</td>
<td>0-4 jobs</td>
</tr>
</tbody>
</table>

[BLS 2015]

### Repeated spells of unemployment

**Born between 1957 - 1965**

<table>
<thead>
<tr>
<th>Ages 18 – 48</th>
<th>5.6 (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>high school dropout</td>
<td>7.4</td>
</tr>
<tr>
<td>high school graduate</td>
<td>5.6</td>
</tr>
<tr>
<td>college graduate</td>
<td>3.9</td>
</tr>
<tr>
<td>33% high school dropouts</td>
<td>10 or more</td>
</tr>
<tr>
<td>22% high school graduates</td>
<td>10 or more</td>
</tr>
<tr>
<td>6% college graduates</td>
<td>10 or more</td>
</tr>
</tbody>
</table>

[BLS 2015]
Unemployment and health

- Physical and mental health effects
- Job 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 and health

- Underemployed workers report lower levels of health and well-being
- Underemployed: Not having enough adequately paid work or not doing work that makes full use of a worker’s skills or abilities
- Types associated with lower levels of health
  - Hours based
  - Income based
  - Skill based
  - Status based
- Underemployment seems to have health effects more like those of unemployment than adequate employment

[Friedman and Price 2003]
Health burden within and between jobs

Expanded Focus Broader Vertically

Current Broader horizontally

Broader vertically and horizontally

Working Life Continuum

Well-being
Well-Being is linked to

- Lower healthcare costs
- Reduced injury
- Reduced illness
- Lower ratio of absenteeism and presenteeism
- Worker, enterprise, and national productivity

Worker Well-Being

Integrative concept that characterizes quality of life with respect to health and work-related environmental, organizational, and psychosocial factors.

Five domains:
- workplace physical environment and safety climate;
- workplace policies and culture;
- health status;
- work evaluation and experience; and
- home, community, and society.

[Chari et al 2018]
Need for a comprehensive measure

- NIOSH Total Worker Health™ (TWH) defines and operationalizes a framework for achieving worker well-being
- TWH Program designed to support policies, programs, and practices that integrate protections from work-related safety and health hazards with promotion of injury and illness prevention efforts that advance worker well-being
- NIOSH field testing instrument to measure well-being domains
- How do we measure an expanded view of burden?

This expanded focus will require new skills and competencies for the OSH professions.

Will you be ready?
History of OSH expanded focus

- 1833 first OSH focused staff in Britain reporting to Central government
  - 4 inspectors ensuring compliance with child labor laws
- Late 19th century saw first dedicated OSH staff
  - Large and hazardous companies
  - Monitoring roles related to inspections and rule compliance
- Development of generalist and specialist OSH professions
  - Professionalization of OSH specialties
  - Conflict and questions between professions
  - Which profession owns what?

[Hale 2019]

History of OSH expanded focus

- Last 100 years OSH focus expanded from technological base concerned with machinery, chemical safety, and industrial hygiene
  - 1920s – human behavior, training, accident prevention, and compliance
  - 1950s – ergonomic design
  - 1970s – chemical and safety management
- Last 50 years OSH professions common in industrialized countries
- Many countries now recognize generalist and specialist roles
- Companies combining environmental and occupational roles

[Hale 2019]
Conclusions and next steps

- Protecting the workforce of the future requires a holistic view of the hazards they experience and the range of adverse effects that result
- The occupational safety and health field should expand the traditional view of burden to be broader horizontally and vertically
- New skill sets are needed to identify and measure an expanded view of burden
- OSH research and training should have a futures orientation
Thank you
SFelknor@cdc.gov

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

References


References Contd.


