Approaches to Assessing Worker Mental Health Using Existing Population Health Data

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Objectives

Related sectors – Mining and Oil and Gas Extraction
Social determinants of health
Psychosocial hazards
Suicides and drug overdoses among workers
Using indicators to assess workers’ mental health
Preliminary findings
Some lessons learned
NIOSH **Miner Health Program** (MHP)

EBF project leverages existing health data to compare miners’ health to other workers

CDC systems are our primary data sources for health, health behaviors & deaths in the adult population

**Multi-disciplinary approach**
*(2-3 project FTEs)*

- Epidemiology
- Industrial Hygiene
- Statistics
- Health Communication
- Behavioral Science

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official positions of the National Institute for Occupational Safety and Health or the Centers for Disease Control and Prevention.
National Occupational Research Agenda - 10 industry sectors

- Agriculture, Forestry and Fishing
- Construction
- Healthcare and Social Assistance
- Manufacturing
- Mining*
- Oil and Gas Extraction
- Public Safety
- Services
- Transportation, Warehousing and Utilities
- Wholesale and Retail Trade

*(except oil and gas)
Mining Sector (21)

Mining, except oil and gas
186K*

Oil and gas extraction (117K)
Support activities for mining (279K)
396K*

Work as a social determinant of health

Managing Stress and Mental Health

Psychosocial hazards and exposures at work (some examples)

- Unemployment or underemployment (i.e., job insecurity)
- Fatigue, burnout, loneliness
- Wages
- Lack of benefits/paid sick leave
- Transportation and commuting assistance
- Working conditions that can predispose to chronic health problems or pain
- Industry, Occupational, cultural, and geographic differences
Increasing suicide rates among workers

Males in Mining sector and Females in Construction & Extraction occupations have the highest suicide rates among all industries and occupations, by sex.

2017 - 7 times more working-age persons died by suicide (38,000) than from fatal on-the-job injuries.

Suicides have increased 40% since year 2000.
An epidemic of drug overdose

2007 - 2012 workers in Extraction Occupations had elevated mortality from both drug and prescription opioid overdose²

2021 had 108,000 drug overdose deaths (all ages). A 15% annual increase, as in previous two years.

CDC: Disparities by age, race/ethnicity, and other factors.

²(Morano L et al 2018) MMWR
Analyzing suicide rates by industry and occupation using vital statics

Completed: National Violent Death Reporting System (NVDRS), 2016
32 States collected usual industry and occupation for people who died

In progress: National Vital Statistics System (NVSS), 2021
49 States collected usual industry and occupation for people who died
Analyzing suicide rates by industry and occupation

![Graph showing suicide rates by industry](image-url)

- **All current workers, 2016, 32 States**: Male 27, Female 7.7
- **Mining and Oil and Gas Extraction**: Male 54, Female 2016 NVDRS, 32 states
- **Construction**: Male 45
- **Other Services**: Male 39, Female 10
- **Transportation and Warehousing**: Male 30, Female 10
- **Administrative and Support and Waste Mgmt Services**: Male 26, Female 5.2
- **Health Care and Social Assistance**: Male 19, Female 7.5
- **Finance and Insurance**: Male 15, Female 6
- **Educational Services**: Male 9.3, Female 3.9

*Not all groups are shown*
Analyzing suicide rates by industry and occupation

<table>
<thead>
<tr>
<th>Occupation Group</th>
<th>Rate per 100,000 workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>All current workers, 2016, 32 states</td>
<td>27</td>
</tr>
<tr>
<td>Construction and extraction</td>
<td>26</td>
</tr>
<tr>
<td>Installation, maintenance, and repair</td>
<td>37</td>
</tr>
<tr>
<td>Farming, fishing, and forestry</td>
<td>31</td>
</tr>
<tr>
<td>Transportation and material moving</td>
<td>30</td>
</tr>
<tr>
<td>Community and social service</td>
<td>15</td>
</tr>
<tr>
<td>Office and administrative support</td>
<td>14</td>
</tr>
<tr>
<td>Business and financial operations</td>
<td>12</td>
</tr>
<tr>
<td>Education, training and library</td>
<td>10</td>
</tr>
</tbody>
</table>

2016 NVDRS, 32 states
Mental health is an important part of worker well-being

Poor mental health is a major source of disability, social and health burden

Suicide – the worst outcome = tip of the iceberg

Relevant and common mental health conditions:
  • Suicide ideation
  • Depression
  • Anxiety
  • Frequent mental distress
Using the Behavioral Risk Factor Surveillance System to analyze workers’ mental health by industry and occupation

>400K telephone interviews annually, CDC and the states
Industry and Occupation Optional Module added by NIOSH in 2013

39-year history; Core questions are changed very infrequently

Complex survey design – respondents are weighted to adjust for the sampling design

Mental health indicators - ever diagnosed, and current self-assessment

https://www.cdc.gov/brfss/index.html
Mental health indicators in the BRFSS core survey

(Ever) Diagnosed Depression

have you ever been told by a licensed health care professional that you have...?

(asked to recall a clinical diagnosis)

Mentally Unhealthy Days (MUD)

how many days in the past 30 days has your mental health not been good?

Calculated indicators - from MUD

Frequent mental distress (FMD) ≥ 14 days of past 30
Extreme mental distress (ExD) 30 of past 30
Mean unhealthy days (groups)
Behavioral Risk Factor Surveillance System (BRFSS)
2015-2019, 37 states, Currently employed adults

Sample size 452,767
<1% of sample was Mining
Demographic estimates, Behavioral Risk Factor Surveillance System 2014-2018, 38 states

- College or Technical School-Attended or Graduated
- Other - non Hispanic
- Hispanic
- Black - non Hispanic
- White - non Hispanic
- Age >= 55 years
- Sex - Male

**Legend:**
- All other industries
- OGE
- Mining, except OGE
## Mental health outcomes – BRFSS 2015-2019, 37 states

<table>
<thead>
<tr>
<th></th>
<th>Males (%)</th>
<th>95% CL*</th>
<th>Mining</th>
<th>OGE</th>
<th>All other industries</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total N, unweighted</td>
<td></td>
<td>849</td>
<td>2464</td>
<td>248,581</td>
</tr>
<tr>
<td>(Ever) Diagnosed depression</td>
<td></td>
<td></td>
<td>5.7 (3.2, 8.2)</td>
<td>9.1 (4.4, 13.8)</td>
<td>9.9 (9.6, 10.2)</td>
</tr>
<tr>
<td>Freq. Mental Distress</td>
<td></td>
<td></td>
<td>10.6 (3.7, 17.5)</td>
<td>9.0 (4.2, 13.8)</td>
<td>8.0 (7.7, 8.2)</td>
</tr>
<tr>
<td>Extreme Distress</td>
<td></td>
<td></td>
<td>--</td>
<td>5.3 (1.0, 9.5)</td>
<td>3.4 (3.3, 3.6)</td>
</tr>
<tr>
<td>Mean MUD</td>
<td></td>
<td></td>
<td>3.3 (1.2, 5.3)</td>
<td>2.8 (1.5, 4.0)</td>
<td>2.7 (2.6, 2.8)</td>
</tr>
</tbody>
</table>

*Weighted estimates

¥ CV > 0.30, interpret with caution

--CV >0.50, not reportable
### Mental health indicators – BRFSS 2015-2019, 37 states

<table>
<thead>
<tr>
<th></th>
<th>Females (%, 95% CL)*</th>
<th>Mining</th>
<th>OGE</th>
<th>All other industries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total N, unweighted</strong></td>
<td></td>
<td>120</td>
<td>252</td>
<td>246,085</td>
</tr>
<tr>
<td><strong>(Ever) Diagnosed depression</strong></td>
<td>19.4 (2.0, 36.7) ¥</td>
<td>18.1 (2.0, 34.3) ¥</td>
<td>19.6 (19.2, 20.0) ¥</td>
<td></td>
</tr>
<tr>
<td><strong>Freq Mental Distress</strong></td>
<td>4.7 (0.3, 9.0) ¥</td>
<td>--</td>
<td>--</td>
<td>11.5 (11.2, 11.9)</td>
</tr>
<tr>
<td><strong>Extreme Distress</strong></td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>4.8 (4.6, 5.0)</td>
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<tr>
<td><strong>Mean MUD</strong></td>
<td>2.3 (0.9, 3.8) ¥</td>
<td>5.5 (0.7, 10.2) ¥</td>
<td>3.9 (3.8, 4.0)</td>
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Limitations, the BRFSS mental health indicators

Self-reported mental health measures may be underreported - recall and social desirability bias

A clinical diagnosis of depression requires the worker seeking care

Usually not possible to report estimates for detailed industry and occupation groups.

Misclassification of industry and occupation is possible
Resources (some examples)

- Mental Health | CDC
- Suicide Prevention | Suicide | CDC
- Total Worker Health | NIOSH | CDC
- Let's Get Started - Total Worker Health | NIOSH | CDC
- Opioids in the Workplace | NIOSH | CDC
- Center for Health, Work & Environment | Colorado School of Public Health (cuanschutz.edu)
- Newsroom Feature: Health Worker Mental Health | NIOSH | CDC
Lessons learned

There is more that we don’t know than what we know.

A lot more research is needed.

Suicide rates by industry and occupation are useful for showing trends and targeting prevention efforts.

The self-reported MH indicators are useful to identify patterns among industry and occupation groups.

There are good resources available now to assist employers.
Questions?

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