Evaluating the Difference in Prevalence of Alcohol and Illicit Drug Use in the Construction and Oil and Gas Industry

Heng Tan, AFOEM Trainee
Stewart Lloyd, Occupational Physician
Background

• Largest research is based on population based questionnaire survey - National Drug Strategy Household Survey
• NDSHS 2013 Demographic Results¹:
  ❖ 42% lifetime prevalence of AOD and 15% in the 12 mths prior.
  ❖ Most common illicit drug use – Cannabis 35%, Hallucinogens 11%, Amphetamines 7%

Age group and sex

Introduction

NDSHS by occupational sector results:
- Hospitality (32%) > Construction (24%) > Agriculture (16%) > Mining (12%)
- Trades person and unskilled workers > professionals

Other research findings:
- Pick, Boeckman et al on South Australian Building Industry
- Banwell, Quinn et al on ACT Building industry

2. Pidd K, Boeckmann R, Morris M. Adolescents in transition: The role of workplace alcohol and other drug policies as a prevention strategy
Study Description

Type of study
- Cross sectional observational study
- Construction and Oil and Gas (Mining) Industry
- Based on on-site drug and alcohol random screening

Objectives
1. Null hypothesis – there is no statistically significant difference in the prevalence of illicit drug use in construction and oil and gas workers
2. To compare results of AOD positive cases in terms of demographics and type of illicit drug use
3. Financial cost of AOD testing
Methods

- Sample population
- Screening procedure – sampling, labeling, transport and analysis
Urine Collection Procedure

- Instant urine
  - Instant Negative
    - GCMS Positive
    - GCMS Negative
  - Instant Non-Negative
    - MRO Positive
    - MRO Negative
Data Analysis

Confounders:
1. Age
2. Sex
3. Occupational title

Analysis:
1. Prevalence of MRO Verified Positive results
2. Type of illicit drug
3. Age, sex and occupational title of MRO Verified Positive Result
Data Analysis

Confounder Adjustment

1. Age Group: Stratification
2. Sex and Occupational title: Matching, equally matched in both sample population

Statistical analysis

- Measure of Association: Chis Square 2 tailed P-value analysis and Fisher Exact 2 tailed P value analysis
- Adjustment for Age confounding: Mantel–Haenszel method
- Statistical Analysis: CDC Stat-Calc Software
## Results: Demographics

<table>
<thead>
<tr>
<th>Industry</th>
<th>Total number of subjects</th>
<th>Number of males</th>
<th>Number of females</th>
<th>Median Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>232</td>
<td>217</td>
<td>15</td>
<td>36</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>257</td>
<td>254</td>
<td>3</td>
<td>39</td>
</tr>
</tbody>
</table>
### Results: Age Group distribution

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Construction N</th>
<th>%</th>
<th>Oil and Gas N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>73</td>
<td>31</td>
<td>37</td>
<td>14</td>
</tr>
<tr>
<td>30-39</td>
<td>60</td>
<td>26</td>
<td>92</td>
<td>36</td>
</tr>
<tr>
<td>40-49</td>
<td>46</td>
<td>20</td>
<td>75</td>
<td>29</td>
</tr>
<tr>
<td>50-59</td>
<td>32</td>
<td>14</td>
<td>38</td>
<td>15</td>
</tr>
<tr>
<td>&gt;60</td>
<td>21</td>
<td>9</td>
<td>15</td>
<td>6</td>
</tr>
</tbody>
</table>
# Results: Prevalence of MRO Verified Positive result

<table>
<thead>
<tr>
<th></th>
<th>Neg Instant</th>
<th>Non-Neg Instant</th>
<th>GCMS Confirmed Pos</th>
<th>MRO Verified Pos</th>
<th>MRO Verified Neg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>202</td>
<td>30</td>
<td>28</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Oil and Gas</td>
<td>245</td>
<td>11</td>
<td>10</td>
<td>1</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number of MRO Verified Positive test</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29</td>
<td>9</td>
</tr>
<tr>
<td>30-39</td>
<td>6</td>
</tr>
<tr>
<td>40-49</td>
<td>4</td>
</tr>
<tr>
<td>50-59</td>
<td>1</td>
</tr>
<tr>
<td>&gt;60</td>
<td>1</td>
</tr>
</tbody>
</table>
MRO Verified Positive Results

Type of illicit drug
Of the 21 samples of MRO Verified positive results
❖ 17 – THC
❖ 4- MET

Gender differences
❖ 20 out of 21 – males

Cost of implementation of program
❖ $90 per employee per instant cup screen
❖ $180 per analysis that requires further GCMS testing
## Null hypothesis test

<table>
<thead>
<tr>
<th>Age Stratified Measures of Association</th>
<th>P-value (2 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uncorrected chi square</td>
</tr>
<tr>
<td>Age Group: 18-29</td>
<td>0.02582</td>
</tr>
<tr>
<td>Age Group 30-39</td>
<td>0.01039</td>
</tr>
<tr>
<td>Age Group 40-49</td>
<td>0.009403</td>
</tr>
<tr>
<td>Age Group 50-59</td>
<td>0.2735</td>
</tr>
<tr>
<td>Age Group &gt;60</td>
<td>0.3194</td>
</tr>
<tr>
<td>Un-stratified (Crude Values)</td>
<td>0.000003936</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjusted Mantel Haensel Summary</th>
<th>P-value (2 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi Square</td>
<td>0.000011116</td>
</tr>
<tr>
<td>Fisher Exact</td>
<td>0.000003573</td>
</tr>
</tbody>
</table>
Discussion

Industry and Occupational Title Difference
- Construction vs. Oil and Gas – Rejects the null hypothesis

Gender and Age Differences
- Consistent with NDSHS results

Prevalence of MRO Verified Positive Drug Screen
- Significantly lower compared to findings from NDSHS
- Extrapolated implications
Cost Benefit Analysis

- Due to differences in numbers screened, cost per employee slightly lower in Construction
- Overall cost vs Return of Investment from deterrent effect
Strength and Weakness

**Strength**
- Methodology

**Weakness**
- Sample size
- Only 2 companies
- Duration of study
Findings from this study which is consistent with the NDSHS data includes:

- Higher prevalence of AOD use in males and in the 18-29 age-group.
- Marijuana and amphetamines are the most common type of AOD used.

Key findings from this study are:

- Prevalence of AOD in Mining industry is statistically significantly lower than Construction.
- Occupational prevalence rate of AOD use in this study is significantly lower compared to the NDSHS.

- Cost benefit analysis of AOD screening – requires further investigation.