Are Military Occupational Specialty Codes (MOS) Useful Epidemiologic Tools to Predict Inhalational Exposures during Deployment?

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Military deployment to Iraq and Afghanistan is associated with exposure to complex inhalational hazards.
Deployers are at increased risk of respiratory symptoms and occupational disease

- Asthma
- Emphysema
- Vocal cord dysfunction
- Allergic rhinitis/allergies
- Acute eosinophilic pneumonia
- Constrictive bronchiolitis
Clinical Center for Deployment Lung Disease at National Jewish Health
Army MOS 11B – Infantry

Job Duties

• Perform as a member of a fire team during drills and combat
• Aid in the mobilization of vehicles, troops and weaponry
• Assist in reconnaissance missions
• Process prisoners of war and captured documents
• Use, maintain and store combat weapons (e.g., rifles, machine guns, antitank mines, etc.)

Study Aim

To investigate the utility of a respiratory exposure matrix in identifying MOS codes that may be at increased risk for respiratory symptoms and/or disease.
How did we do this?

• 228 Army MOS scored
• 37 Marine MOS scored
• Panels included:
  • 3 occupational pulmonologists
  • 2 or 3 previously deployed physicians
• Deployer-reported data used for validation

Source: Michael Becker/Fox via AP
Validation with questionnaire data from 81 symptomatic deployers

• 48 Army MOS and 6 Marine MOS

• Infantry MOS (Marine 3, Army 11B, 11C, 11O) were reported by 22% (18) of deployers
Exposure matrix used for expert-panel rating and for deployer-reported data

<table>
<thead>
<tr>
<th>Respiratory hazard</th>
<th>Exposure metric</th>
<th>Exposure intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Diesel exhaust</td>
<td>Frequency</td>
<td>&lt; 2 times/months</td>
</tr>
<tr>
<td>Sandstorms</td>
<td>Frequency</td>
<td>&lt; 2 times/months</td>
</tr>
<tr>
<td>Time worked outdoors</td>
<td></td>
<td>&lt; 25% of the time</td>
</tr>
<tr>
<td>Burn pits</td>
<td>Proximity</td>
<td>&gt; 2 km away</td>
</tr>
<tr>
<td>Combat dust</td>
<td>Likelihood</td>
<td>Unlikely</td>
</tr>
<tr>
<td>VDGF exposure</td>
<td></td>
<td>Unlikely</td>
</tr>
</tbody>
</table>
What did we find?

1. Across all MOS codes, time worked outdoors and diesel exhaust were scored highest by the panel.

2. All exposures besides VDGF were scored significantly higher (p-value <0.0001) for combat-related jobs compared to non-combat related jobs.
The rater panel tended to \textbf{underestimate} diesel exhaust exposure, time worked outdoors, and exposure to burn pits while \textbf{overestimating} exposure to sandstorms and combat dust compared to deployer reports.
Symptomatic deployers may be working in jobs with higher exposures to inhalational hazards.

Results

MOS seen in clinic

MOS not seen in clinic
Jobs in the top quintile

Results

- Maximum Score
- Firefighter (Army 12M)
- Motor Transport (Marine 35, Army 88M)
- Aviation (Army 15O)
- Special Forces (Army 18O, 18X, 18Z)
- Combat Medicine (Army 18D, 68W)
- Ordinance Disposal (Marine 23, Army 89D)
- Airfield Services (Marine 70)
- Military Police (Army 31B, 31O)

- Diesel exhaust
- Sandstorms
- Time worked outdoors
- Burn pits
- Combat dust
- VDGF exposure
Jobs in the top quintile

- Diesel exhaust
- Sandstorms
- Time worked outdoors
- Burn pits
- Combat dust
- VDGF exposure

Results

![Bar chart showing various job categories and their exposure levels]
Jobs in the bottom quintile

Results

- Ammunition Stock Control and Accounting Specialist (Army 89A)
- Supply Administration and Operations (Marine 30)
- Geospatial Engineer (Army 12Y)
- Music (Marine 55, Army 42R, 42S)
- Marine Air Ground Task Force Plans (Marine 5)
- Air Control/Air Support/Anti Air Warfare/Air Traffic Control (Marine 72)
- Meteorology (Marine 68)
- Minimum Score

Legend:
- Diesel exhaust
- Sandstorms
- Time worked outdoors
- Burn pits
- Combat dust
- VDGF exposure
Take home points

• MOS codes have limitations as epidemiologic tools in predicting risk from hazardous inhalational exposures.

• Military deployment exposures are likely related to location (e.g., presence of a burn pit) or season (e.g., Shamals in Arabian/Persian Gulf) not just to job code.
Overview
As an Army chaplain you will have the responsibility of caring for the spiritual well-being of Soldiers and their Families.

Job Duties
• Providing advice in matters pertaining to religion, morals and morale
• Overseeing a full program of religious ministries, including workshops, counseling sessions, religious education and special events
• Officiate at official ceremonies such as military functions, funerals and memorials
• Provide religious ministry to a variety of armed service personnel and civilians from the U.S., foreign nations and agencies
Implications for prevention

Deployment exposures are substantial and could be limited with:

• Substitution (incinerators rather than burn pits)
• Robust administrative changes (modified duties on poor air quality days)
• Less practical in theatre: engineering controls and personal protective equipment
Participating Military Personnel

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• Bibi Gottschall, MD, MSPH
  • Jenna Wolff
  • Matt Strand, PhD
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• Oscar Sanders, MD
• Tony Macedonia, MD
• Gabe Pepper, MD

Source: https://www.zazzle.com.au/red+white+blue+thank+you+stickers