

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



US Army soldiers watch garbage burn in a burn pit at Forward Sandstorm in Al Asad, Iraq in 2007.
Helicopters generated dust.

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.)



Source: <https://www.goarmy.com/careers-and-jobs/browse-career-and-job-categories/combat/infantryman-11b.html>

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.



Source: <https://www.merchantmaverick.com/best-high-risk-merchant-account-providers/>

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

Respiratory hazard	Exposure metric	Exposure intensity		
		Low	Medium	High
Diesel exhaust	Frequency	< 2 times/months	Weekly	>Weekly
Sandstorms		< 2 times/months	Weekly	>Weekly
Time worked outdoors		< 25% of the time	25-50% of the time	> 50% of the time
Burn pits	Proximity	> 2 km away	1-2 km away	< 1 km away
Combat dust	Likelihood	Unlikely	Somewhat Likely	Very Likely
VDGF exposure		Unlikely	Somewhat Likely	Very Likely

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.

Diesel exhaust
Time working outdoors
Burn pits

Sandstorms
Combat dust

The rater panel tended to **underestimate** diesel exhaust exposure, time worked outdoors, and exposure to burn pits while **overestimating** exposure to sandstorms and combat dust compared to deployer reports.

Symptomatic deployers may be working in jobs with higher exposures to inhalational hazards.



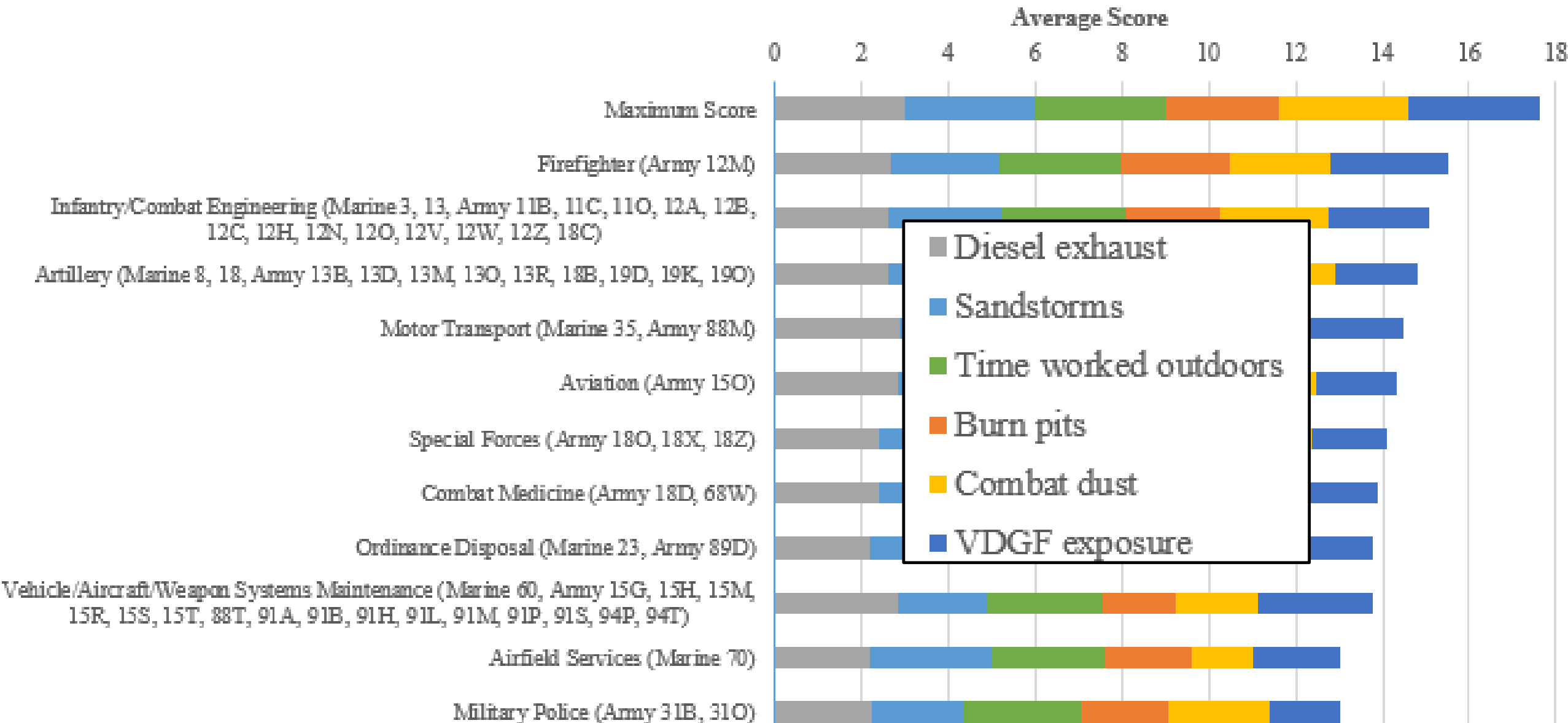
MOS seen in clinic



MOS not seen in clinic

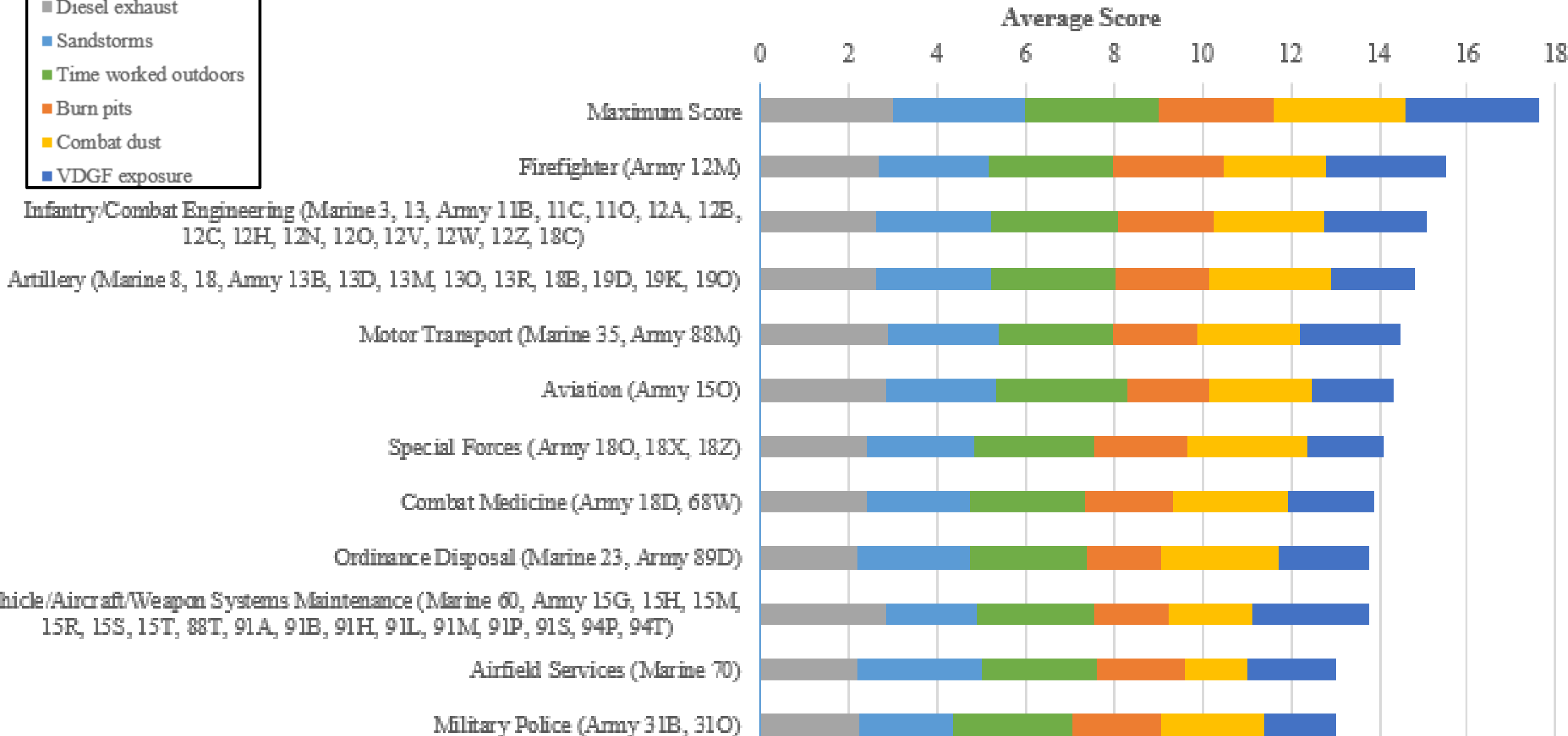
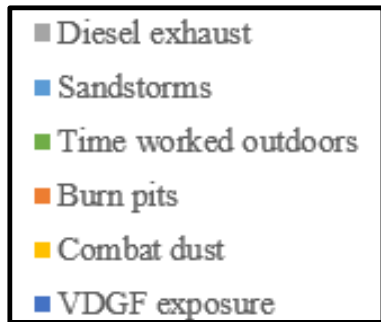
Jobs in the top quintile

Results



Jobs in the top quintile

Results



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.

Army 560 - Chaplain

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

National Jewish Health:

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- Silpa Krefft, MD, MPH
- Bibi Gottschall, MD, MSPH
 - Jenna Wolff
 - Matt Strand, PhD
- Richard Meehan, MD, FACP

- Oscar Sanders, MD
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 - Gabe Pepper, MD

