



SUMMARY OF EVIDENCE STATEMENT: Chronic Respiratory Conditions and Military Deployment

FACT SHEET 64-018-1111

PURPOSE: This document is intended to provide technical audiences with a summary of the current scientific evidence regarding potential associations between deployment-related exposures and post-deployment chronic respiratory conditions. This information may be used by health care personnel to brief leaders, other health care professionals, etc., as well as to assist with counseling individual Service members and their Family members.

WHY is this information needed? The health and well-being of personnel is a top priority of the Department of Defense (DOD). Some military personnel are returning from Iraq and Afghanistan with persistent respiratory symptoms, and are concerned that exposures sustained during deployment have made them sick. The DOD shares these concerns. Evaluations of potential health risks to service members can be used to identify adverse health outcomes with the goal of preventing them. These include ongoing evaluations of reported associations between deployment and incidence of persistent post-deployment respiratory symptoms and specific chronic lung conditions. The DOD is continually evaluating the strengths and limitations of the available science. This communication represents what the U.S. Army Public Health Command (USAPHC) considers to be factually supported statements that reflect the most current scientific information.

WHO is the population of concern? U.S. personnel deployed to the Central Command (CENTCOM) Area of Operation (AOR) (i.e., Southwest Asia –Iraq, Afghanistan, and Kuwait), from 2002 to present.

WHAT do we know? Personnel deployed to the CENTCOM AOR are exposed to dust and ambient particulate matter, often in conjunction with airborne emissions from vehicles, waste burning, and local industry. For years, DOD has conducted environmental sampling to characterize these exposures. While this ambient sampling has primarily focused only on particulate matter, and can only represent an estimated population exposure experience, the risk characterization of the data demonstrates that variable conditions do occur - to include occasions where pollutant levels exceed health guidelines. When these conditions occur, high levels of ambient particulate matter and burn pit smoke can irritate the eyes and respiratory passages. Such exposures may cause or exacerbate chronic lung conditions including chronic bronchitis and asthma, with effects dependent on the degree and duration of exposure, as well as characteristics of the population being exposed (Pope and Dockery 2006; USEPA 2009).

Medical surveillance data for the U.S. Service member population indicate that the overall rates of chronic respiratory diseases after deployment have been either stable or slightly decreasing over the last 10 years (Baird, ATS 2011). However, the rate of diagnoses of “bronchitis, not specified as acute or chronic,” has been increasing over the past decade. Interpretation of this information is complicated because the disease rates are based on medical encounter diagnosis codes and many clinicians use a limited number of general codes that often do not indicate a specific disease or condition. A diagnosis code, therefore, may be too general and/or may not correspond to a standardized clinical definition of a disease.

The scientific studies evaluating the association between deployment and respiratory health that have been completed indicate a range of different findings. These include: (a) no evidence of an association between deployment and chronic respiratory conditions (AFHSC 2010; Abraham and Baird 2011); (b) an association between specific lung diseases and deployment (Szema, 2010,2011); and (c) evidence of increased respiratory symptoms but not a specific diagnosed disease (Smith, Wong et al. 2009; Abraham, DeBakey et al. 2011; Roop, 2007; and Szema, 2011). Additional conditions (i.e., acute eosinophilic pneumonia (Shorr, Scoville et al. 2004) and constrictive bronchiolitis (King, Eisenberg et al. 2011) are described in case series from which epidemiologic associations cannot be directly estimated. Although all of these studies have methodological limitations that constrain the strength of the conclusions being drawn, their findings warrant continued investigation.

In conclusion, the evidence to date does not clearly support the inference of a specific association between deployment and chronic respiratory conditions among deployed personnel, or the absence of such an association. Although chronic respiratory conditions are generally not expected in a relatively young and healthy adult population (Pope 2000), some previously deployed service members may be experiencing persistent effects or develop chronic respiratory conditions due to their combined deployment exposures in conjunction with unique experiences, smoking habits, and/or individual susceptibilities associated with existing health conditions or genetics.

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WHY is it so difficult to get a clear answer? Arriving at weight of the evidence-based conclusions regarding associations between deployment environmental exposures and long-term respiratory health of military personnel is challenging for several reasons. Key complicating factors include:

- **This is a relatively new area of scientific investigation.** A small but growing number of assessments evaluating the association between military deployment to Southwest Asia and chronic respiratory conditions have been published in the peer-reviewed scientific literature. This current body of evidence shows a range of observations that are not consistent. Multiple, well-conducted studies with consistent results are typically needed to support a strong conclusion regarding an exposure-disease relationship. Current work is ongoing to fill this need.
- **The data used to represent both exposure and medical outcomes are surrogates for actual conditions.** Though the relationship between *deployment-related environmental exposures* and *chronic respiratory disease* is the concern, the “exposure” is often defined only as deployment status (e.g., number, timeframe, and location of deployment(s)), rather than by quantified environmental exposure data. Similarly, medical outcomes are often identified using diagnostic codes that may, or may not, reflect properly diagnosed disease.
- **No single study presents a definitive answer.** The significance of a study’s contribution to the overall body of evidence should be based on a consideration of both its strengths and limitations. Findings should be balanced against limitations regarding study design to include adequacy of comparison groups, exposure assumptions, how outcomes are assessed, latency periods, confounding and other epidemiological biases, and low statistical power.
- **Reports of individual cases may be newsworthy but can also easily distort or distract from the interpretation of available scientific evidence.** Such cases are often compelling and deserving of the public’s attention, and may serve as clues to the scientific community for their hypothesis generating potential. However, individual case-reports alone do not provide strong scientific evidence of an association between deployment-related exposures and the condition. Further studies are needed to explore any potential relationships.

WHAT are we looking at more closely? The DOD has established a Pulmonary Research Working Group with members from the VA, academia, and other civilian research organizations to help determine prioritized areas of focus. New research has begun, including toxicity studies, the "Study of Active Duty Military for Pulmonary Disease Related to Environmental Dust Exposure, (STAMPEDE)" and a retrospective registry of active duty service members with lung disease. Conditions being studied include asthma, dyspnea on exertion, constrictive bronchiolitis, and chronic bronchitis (a chronic obstructive pulmonary disease (COPD)).

Summary: *The evidence to date is inconclusive regarding increased risk of chronic respiratory conditions associated with military deployment to the CENTCOM AOR. However, some previously deployed personnel may experience persistent symptoms or develop chronic respiratory conditions which may be due to their combined deployment exposures, unique experiences, and/or individual susceptibilities. DOD acknowledges the concern regarding potential respiratory health effects associated with deployment, and is collaborating with the VA and independent researchers to further evaluate and quantify potential long-term health risks related to deployment exposures.*

Service members with medical concerns should consult with their health care providers. Providers may consult with the USAPHC Environmental Medicine Program.

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