

# Study of Adult Atopic Dermatitis and Comorbidities in the US Department of Defense (DoD) Healthcare System

Jonathan I. Silverberg, MD, PhD, MPH<sup>1</sup>, Lisa Beck, MD<sup>2</sup>, Mark Boguniewicz, MD<sup>3</sup>, Thuy Lin, CDR USN, MC,<sup>4</sup> Amber M. Evans, MPH,<sup>5</sup> Dharm S. Patel, PhD<sup>6</sup>, Toni Rush, MPH,<sup>5</sup> Andrine R. Swensen, MS, PhD<sup>6</sup>

<sup>1</sup>George Washington School of Medicine and Health Sciences, Washington, DC; <sup>2</sup>Departments of Dermatology, Medicine and Pathology, University of Rochester Medical Center, Rochester, NY; <sup>3</sup>National Jewish Health and University of Colorado School of Medicine; <sup>4</sup>NMCP, Portsmouth, VA; <sup>5</sup>Health ResearchTx, LLC, Trevoze, PA; <sup>6</sup>LEO Pharma Inc., Madison, NJ

## Introduction

- Atopic dermatitis (AD) is a heterogeneous, chronic inflammatory disease<sup>1</sup>
- The 1-year US prevalence of adult AD was 7.2%-10.2% in 2010-2012<sup>1</sup>
- The relationship between AD and allergic diseases is well established, but less is known about the prevalence and association between AD and non-allergic conditions
- Current studies are survey-based and have limitations due to recall, misclassification bias and lack of verification against clinical records<sup>2</sup>
- This study aims to further inform the literature on the diagnosis, treatment and comorbid disease burden of AD within a diverse population

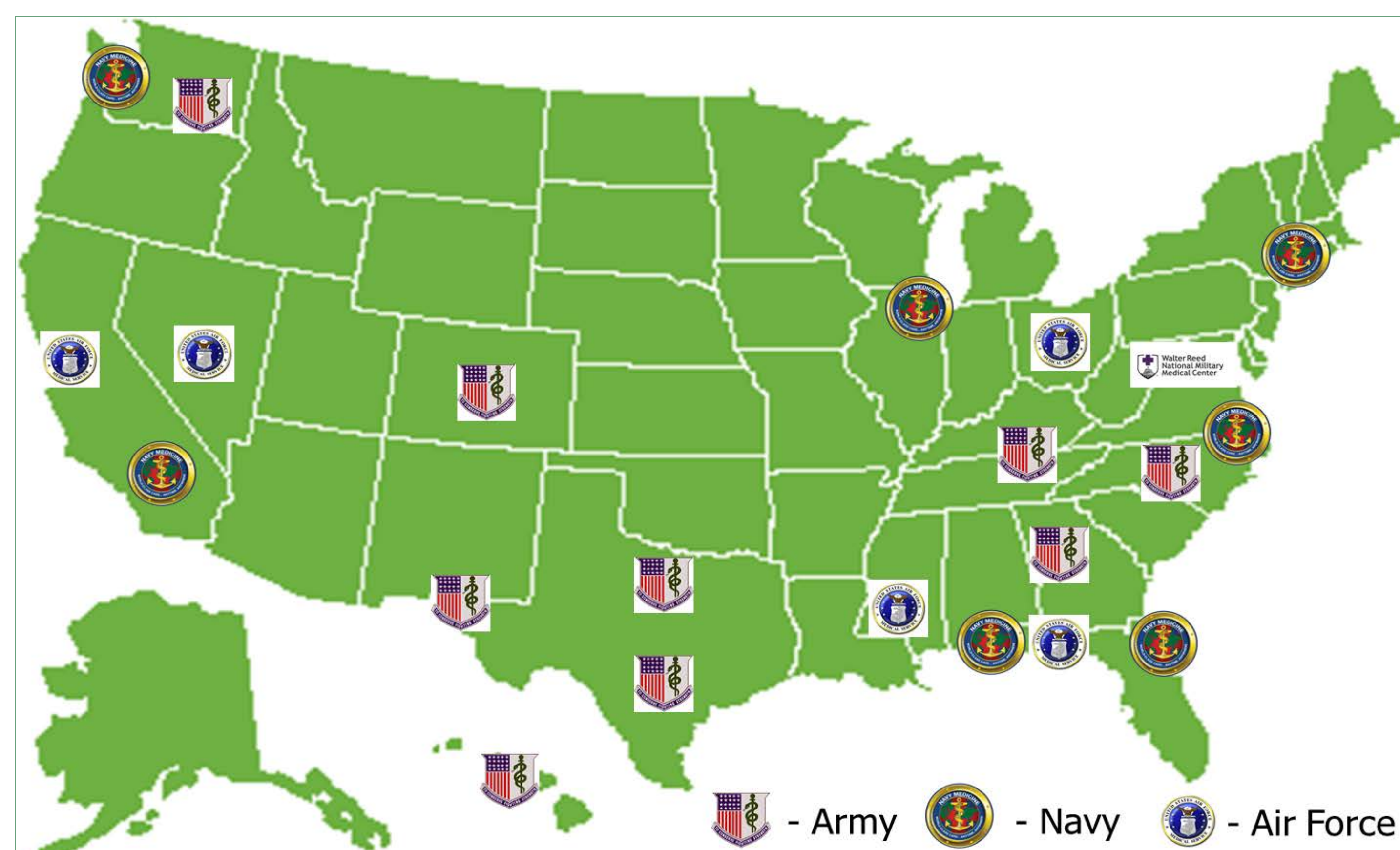
## Objective

**The objective of this study is to characterize and compare the prevalence of comorbidities by AD status (AD and non-AD) within an adult DoD, non-Veterans Affairs, population**

## Methods

- The DoD healthcare system will be the centralized data source used to identify a retrospective cohort to conduct the study
- Identify adult AD and non-AD patients utilizing matching (1:1) on age, gender, region, and index date (month/year) between January 1, 2016 through December 31, 2018
- Inclusion criteria:  $\geq 2$  AD diagnosis codes by a dermatologist, allergist or primary care provider as well as a 3-year baseline AD disease free period
- Exclusion criteria: active duty personnel and patients missing age and sex data
- Comorbidities will be identified by  $\geq 1$  ICD-9/10 diagnosis code(s) during the baseline and follow-up periods and dichotomized as Y/N
- Demographics and clinical characteristics will be documented using descriptive statistics for categorical variables for both the AD and non-AD cohorts
- Conditional logistic regression modeling will be utilized to determine the association between AD status and follow-up period comorbidities
- Subgroup and sensitivity analyses are planned to assess impact, if any, on the final results

Figure 1. Major DoD Medical Facilities



Poster presented at the 17th Annual Winter Clinical Dermatology Conference - Hawaii@ Puako, HI, January 17-22<sup>nd</sup>, 2020

## Data Source Selection Rationale

- One of the largest employers and healthcare plans in the world with patients in all 50 states and multiple countries globally
- Eligible beneficiaries include active duty personnel, retirees and dependents which make-up a large pediatric and elderly population
- The DoD is separate from the Veterans Administration (VA) Health System
- An integrated inpatient, outpatient and ER healthcare system capturing both the DoD facility and the civilian/private sector care for eligible beneficiaries
  - 95% of ambulatory care visits are documented
  - 60% of DoD care in the private sector is captured
- Beneficiaries are demographically similar to the US population in terms of age, sex and acute/chronic diseases
- Manages a robust formulary with minimal ordering restrictions
  - Orders are 100% Computerized Provider Order Entry
  - 20 years of ePrescribing
- Captures full cost data and Medicare-eligible patient data
- Accredited by the Joint Commission and follows the same standards of care expected of civilian institutions
- Results are populated directly from lab, pharmacy and radiology systems
- Mortality data is captured and considered to be more current than National Death Index or Social Security Death Index
- The Electronic Health Record (EHR) is equivalent to the patient chart making accuracy very high
- Quality checks are utilized throughout the system to ensure data integrity
- DoD is capturing:
  - ~10 Million active patients (millions more covered lives)
  - Over 1.5M patient encounters per week
  - Over 2.5M prescriptions per week
  - Over 2,000 births per week
  - 20,000+ uniformed physicians/400,000+ network providers
  - 60+ global Military Treatment Facilities (hospitals) and 400+ clinics supported by 132,000 DoD healthcare professionals
  - Each beneficiary has a longitudinal health record

## Preliminary Results

- 14,447 initial adult AD patients were identified between 2016-2018 and are available for matching to non-AD patients
- 64% of the identified adult AD patients were female
- The mean age is 56.3 years old (SD 20)
- The median age is 59 years old (IQR: 41-72)

### References

- <https://www.ncbi.nlm.nih.gov/pubmed/28577797>
- Brusco NK, Watts JJ. Empirical evidence of recall bias for primary health care visits. BMC Health Serv Res. 2015;15:381.
- Dorrance CDR KA, Ramchandani LCDR S, Neil N, Fisher H. (2013) Leveraging the Military Health System as a Laboratory for Health Care Reform. Military Medicine, 178, 2:142

Figure 2. Preliminary AD Cohort by Age Group

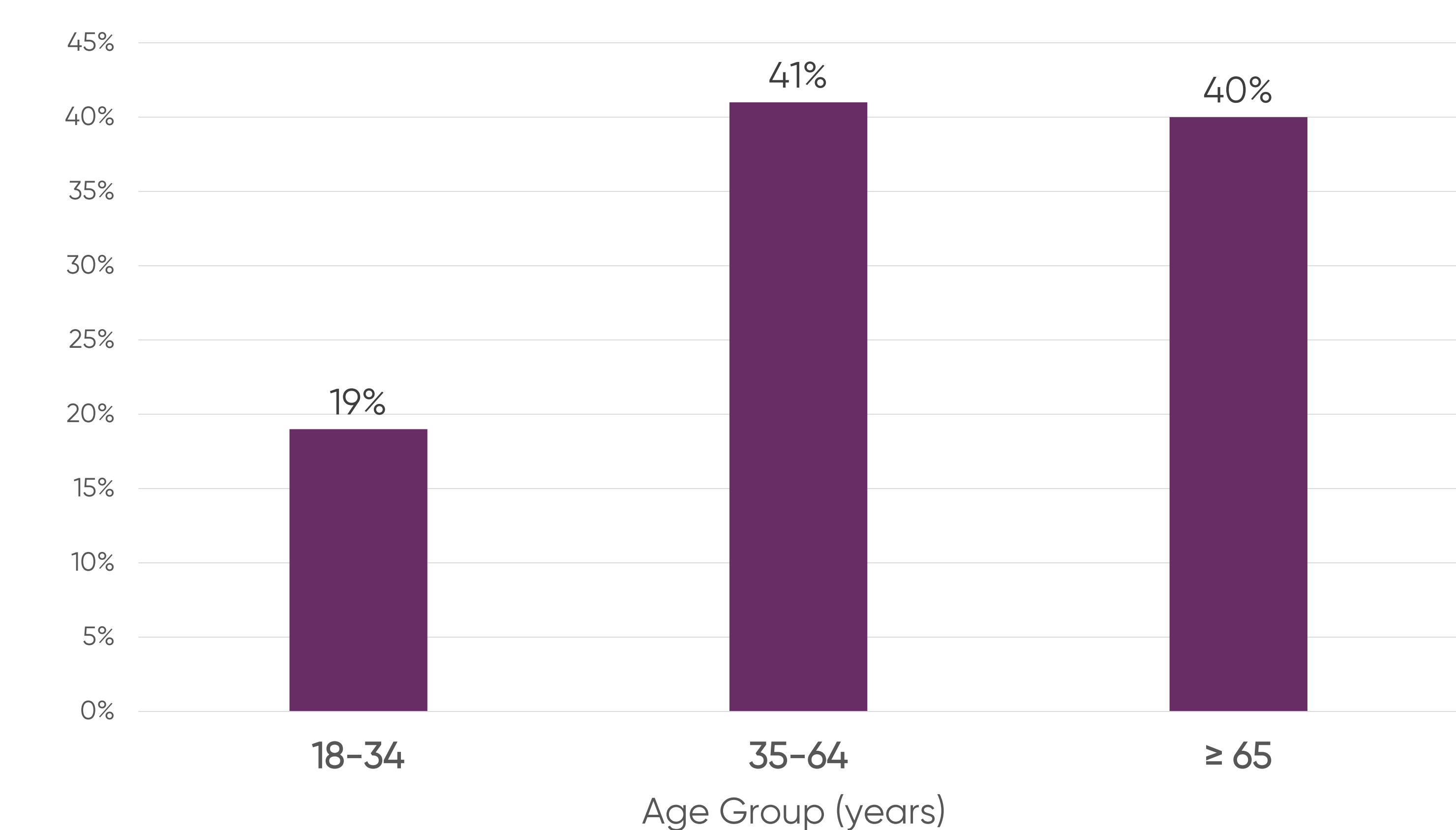
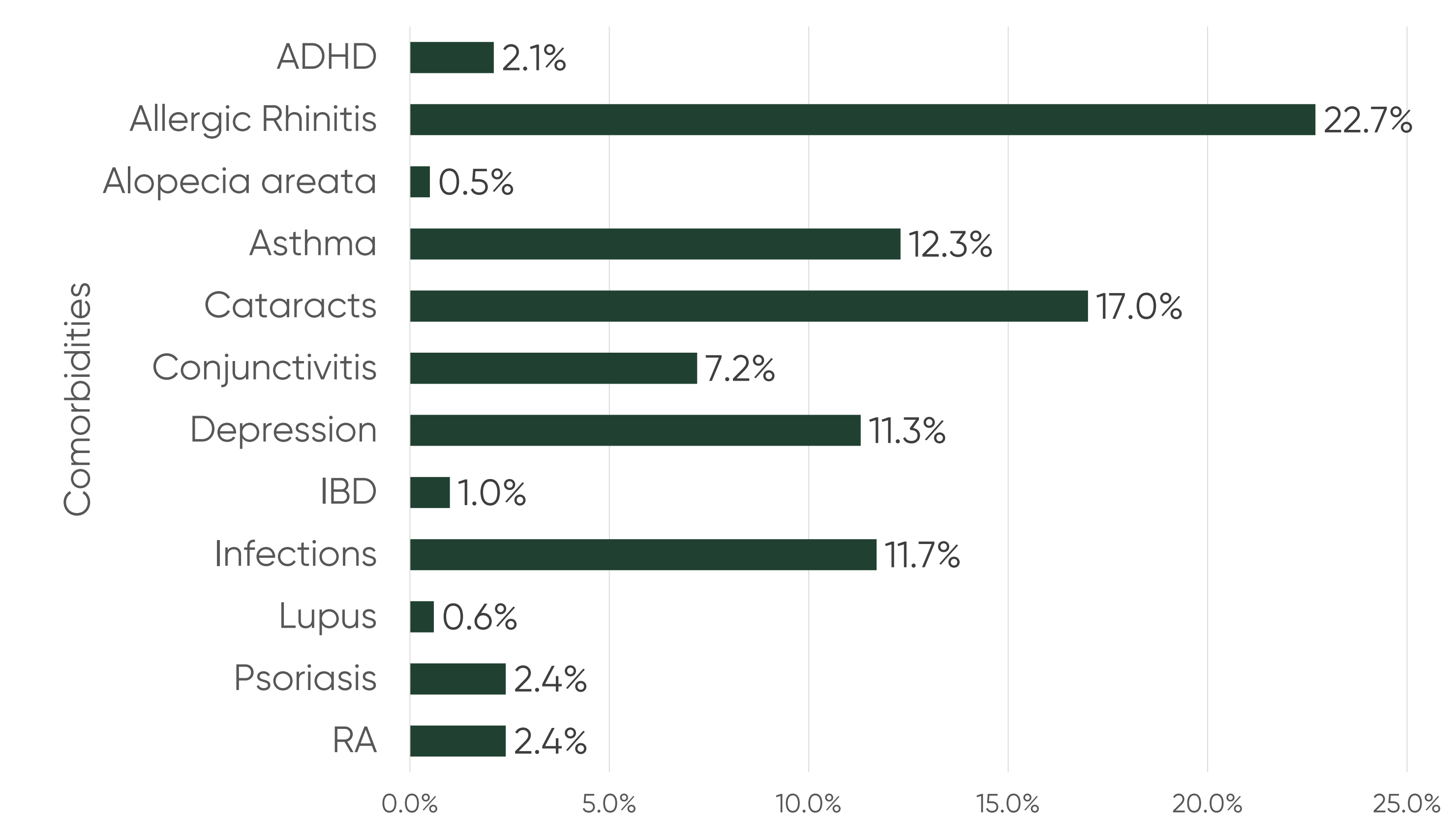


Figure 3. Comorbidities of Interest During the 1-year Baseline Period Prior to Index in AD patients in the DoD database



## Conclusions

- Based on the high retention rate, minimal data lag, comprehensive capture of healthcare events, as well as evidence of research quality data as reflected in publications, the DoD is well suited to successfully accomplish the objective of this study<sup>3</sup>**
- The findings, which represent clinically confirmed comorbidities, highlight the presence of type 2 immunity mediated diseases in the initial AD cohort**
- These preliminary results further define the complexity of AD and its associated comorbidities, which may inform decisions regarding treatment pathways**
- This retrospective cohort study demonstrates a novel use of the DoD for atopic dermatitis research**
- Additional analyses are planned to further define AD patient characteristics and disease burden, understand the prevalence of comorbidities in non-AD matched patients, and document treatment patterns in the US DoD**

### Disclosures

This study was sponsored by LEO Pharma. The views expressed in this article are those of the author(s) and do not necessarily reflect the official policy or position of the Department of the Navy, Department of Defense, or the United States Government. Research data approved by Naval Medical Center, Portsmouth, VA IRB. I am a military service member. This work was prepared as part of my official duties. Title 17 U.S.C. 105 provides that "Copyright protection under this title is not available for any work of the United States Government." Title 17 U.S.C. 101 defines a United States Government work as a work prepared by a military service member or employee of the United States Government as part of that person's official duties.