

**INSTALLATION ASSIGNMENT DURATIONS AND
PATTERNS OF ARMY PERSONNEL:
Environmental Health Use Cases**

PHIP No. 39-13-0421

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Installation Assignment Durations and Patterns of Army Personnel: Environmental Health Use Cases

1. PURPOSE

This information paper provides example environmental health use cases that illustrate how installation duration statistics can be leveraged to inform environmental health assessments at U.S. Army installations. The hypothetical use cases describe how an environmental health assessment can utilize the personnel assignment duration analytics as foundational data in estimates of environmental exposure durations at the installation level.

2. BACKGROUND

Public Health Information Paper (PHIP) No. 39-12-1220 provides personnel assignment duration analytics that represent evidence-based measures of personnel exposure times at the installation level. These analytics provide temporal metrics and statistical descriptions of Army personnel at a given installation to facilitate comprehensive environmental health assessments. They are aggregated by rank, career management field (CMF), and other descriptors for 32 continental U.S. (CONUS) Army installations (Table 1).

A key resource to develop statistical descriptions of assignment durations for groups of military active component personnel at installations is maintained by the U.S. Army Analytics Group, Research Facilitation Laboratory in the secure cloud-based platform called the Person-Event Data Environment (PDE). These data assets provide a timeline for capturing each Soldier's military experience from entry to separation from the Armed Forces.

Table 1. List of 32 CONUS Army Installations

Aberdeen Proving Ground	Fort Irwin	Fort Stewart
Fort Belvoir	Fort Jackson	Fort Wainwright
Fort Benning	Fort Knox	Presidio of Monterey
Fort Bliss	Fort Leavenworth	USAG Hawaii
Fort Bragg	Fort Lee	USAG West Point
Fort Campbell	Fort Leonard Wood	JB Elmendorf-Richardson
Fort Carson	Fort Meade	JB Langley-Eustis
Fort Drum	Fort Polk	JB Lewis-McChord
Fort Gordon	Fort Riley	JB Myer-Henderson Hall
Fort Hood	Fort Rucker	JB San Antonio
Fort Huachuca	Fort Sill	

Statistical analyses on groups or aggregates of personnel data records were completed in PDE for several key strata including Army rank and career or occupation designations. Statistical descriptions of assignment durations for 7 Army rank groupings and 18 CMFs are available for the installations in this study. Army rank groups are Enlisted (E1-E4, E5- E6, E7 and above), Officer (O1-O4, O5-O6, O7 and above), and Warrant Officer; the 18 CMFs and their associated military occupational specialty represent the Operations, Operations Support, and

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Force Sustainment Army Divisions. The 18 CMFs in this study include Air Defense Artillery, Armor, Army Special Operations Forces, Aviation, Field Artillery, Infantry, Chemical, Cyber, Engineer, Military Intelligence, Military Police, Public Affairs, Signal, Health Services, Ordnance, Quartermaster Corps, Solider Support, and Transportation.

Within PHIP No. 39-12-1220, statistical descriptions of personnel assignment durations at the installation level were provided in several formats. Figures 1, 2a, and 2b provide examples of the output reported within the main PHIP.

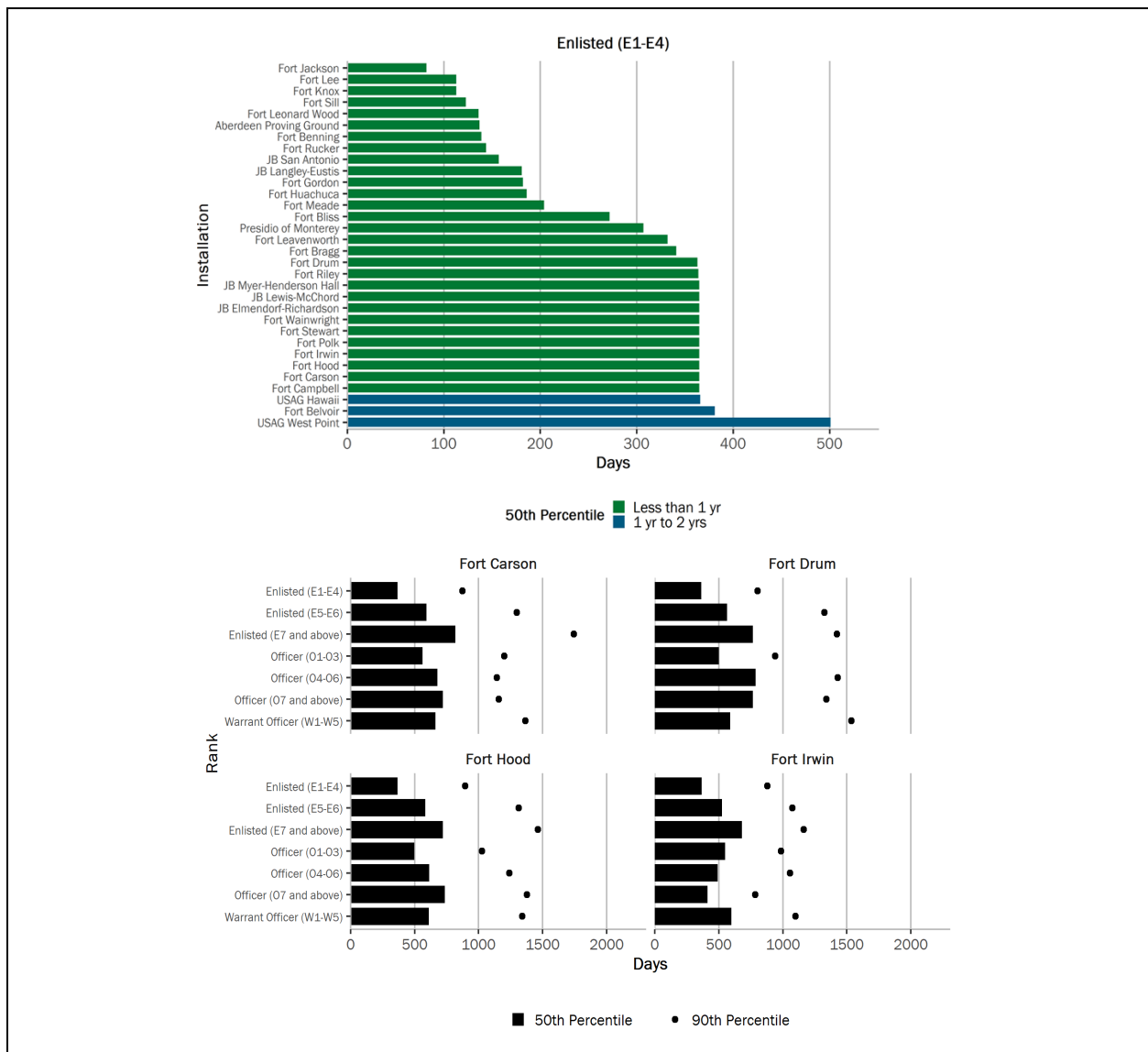


Figure 1. Example Army Rank Groups at the Installation Level

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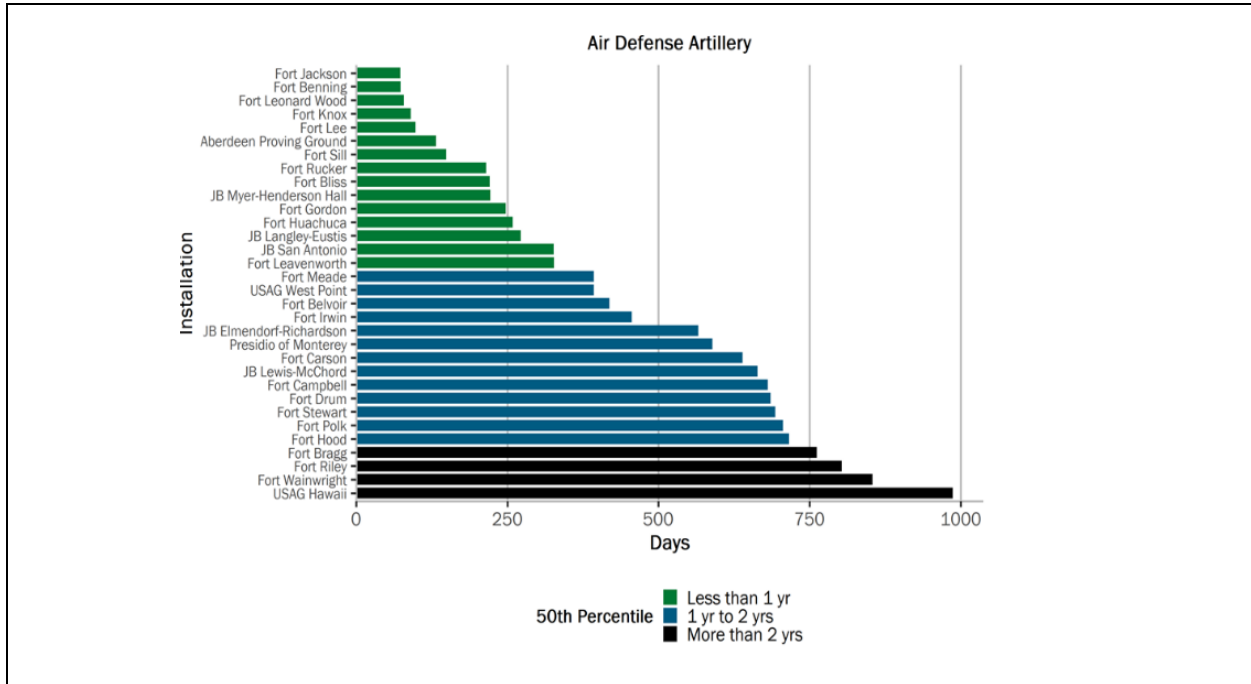


Figure 2a. Example Army Career Management Fields at the Installation Level

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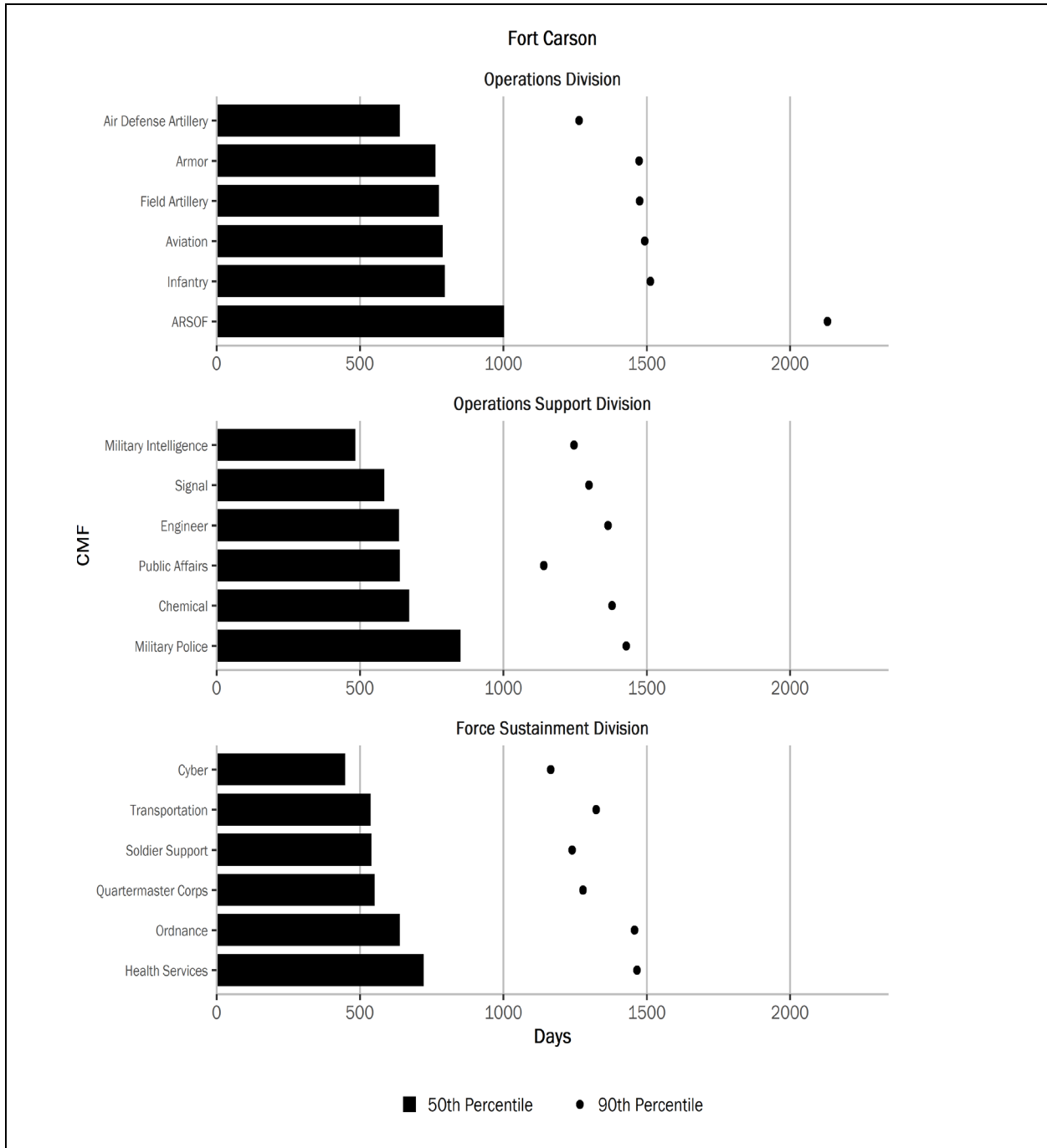


Figure 2b. Example Army Career Management Fields at the Installation Level

3. USE CASE 1—ARMY RANK ASSIGNMENT DURATION AT FORT HUACHUCA

A primary role of an environmental health specialist is to assess potential environmental exposures and risks to chemical hazards for personnel (as an individual or in groups) at a given installation. For instance, during outdoor training exercises at Fort Huachuca, there is a concern that enlisted Soldiers may contact hazardous degreasing solvent contamination in the environment. To assess this potential risk, an environmental health assessment is conducted with foundational data needed on the toxicity of the degreasing solvent and the duration of potential exposure of enlisted Soldiers. In the absence of military-specific exposure duration information, conservative and unrealistic exposure durations are often assumed. For example, the U.S. Environmental Protection Agency (EPA) default exposure durations for environmental risk assessments of outdoor workers range from 200 to 250 days/year for a period of 20 – 25 years (90th percentiles). While default exposure parameters are widely applied in environmental assessments, site-specific exposure parameters are recommended to accurately reflect potential environmental risk. Incorporating assignment duration analytics shows that enlisted E1-E4 spend 186 days (median) at Fort Huachuca, while the 90th percentile is 351 days (see Figure 3). Use of the EPA median default exposure duration of 4,000 days is 21 times greater than Fort Huachuca median exposure duration of 186, which would overestimate potential environmental risk. Use of the assignment duration analytics provides installation-specific metrics to enhance environment risk assessments when compared to use of default exposure parameters. Often, State and Federal regulatory guidance requires conservative default exposure assumptions and parameters to be utilized in environment risk assessments if military-specific foundational data are not available.

If results of the environmental health assessment at Fort Huachuca indicate a concern for environmental exposure to the degreasing solvent, this knowledge can be applied in conducting these assessments at other installations where longer assignment durations are experienced. The Personnel Time on Installation Project (PTIP) analytics show that enlisted (E1-E4) Soldiers have longer assignment durations at 20 other installations when compared to Fort Huachuca, and longer durations may increase potential environmental risk. Longer assignment durations at installations where the degreasing solvent is of environmental concern require further evaluation to determine if risk mitigation measures are needed. The data analytics provide foundational assignment duration metrics for 3 enlisted groups, 3 officer groups, and warrant officers at 32 CONUS installations to support various environmental health considerations and environmental risk assessments.

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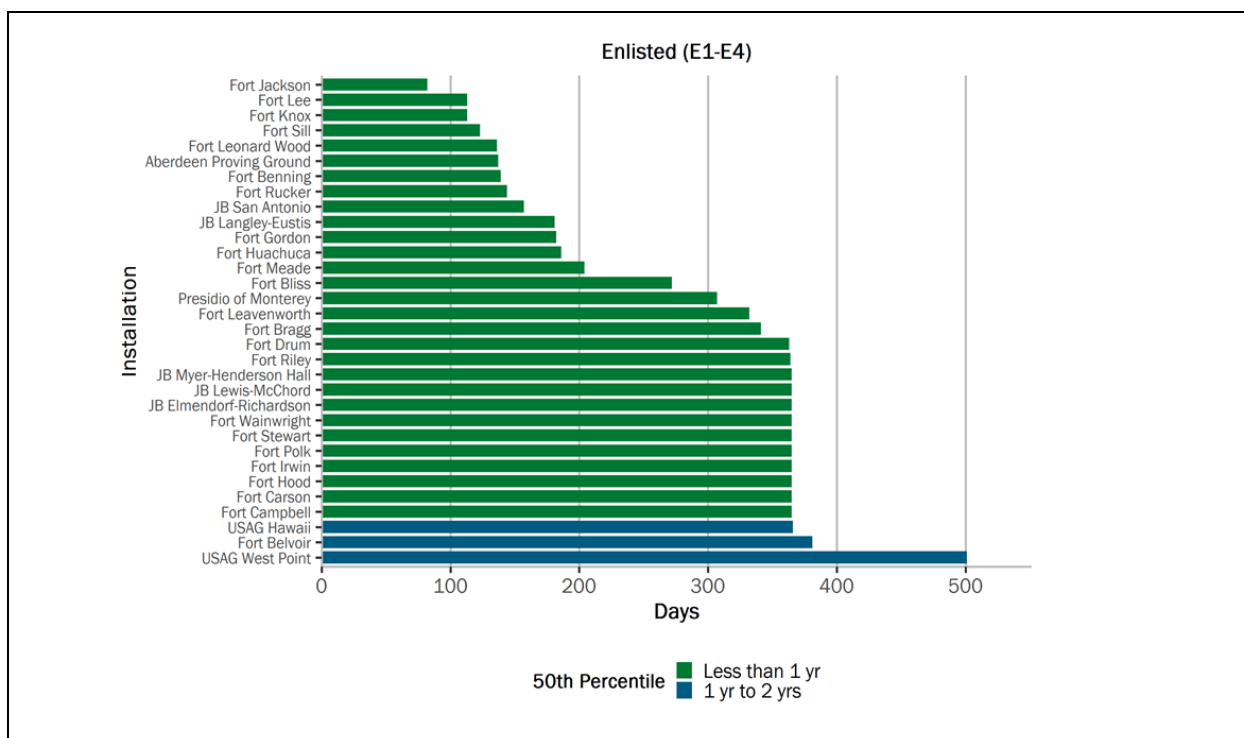


Figure 3. Median Installation Assignment Durations for Enlisted Soldiers (E1 – E4)

4. USE CASE 2—ARMY OCCUPATION/CAREER MANAGEMENT FIELD ASSIGNMENT DURATION AT FORT CARSON

During environmental remediation characterization and cleanup activities of several firing ranges at Fort Carson, the presence of heavy metals and other munitions-related contaminants were discovered in the soil. As there are active ranges adjacent to closed ranges, there is concern for environmental exposures to personnel in the ordnance CMF who frequent the firing ranges. This case study evaluates potential environmental exposure to personnel in the ordnance CMF; however, limited data currently exists on the duration of ordnance personnel spend at Fort Carson. The assignment duration analytics for career management fields developed by PTIP provide insights of career and occupational durations at installations by incorporating military occupation specialty (MOS) data. Assignment durations for ordnance specialties including ammunition specialist, materiel maintenance and munitions, small arms, and Explosives Ordnance Disposal specialist comprise the ordnance CMF in the PTIP analytics shown in Figure 4.

An environmental health assessment is conducted with foundational data needed on the toxicity of the metals and the duration of potential exposure of ordnance personnel. The environmental contaminants of concern associated with soils at the firing ranges are metals such as lead, nickel, and beryllium. For Fort Carson, the PTIP analytics assignment durations for personnel at Fort Carson in the ordnance CMF is 639 days (median) as an exposure duration for environmental risk assessments. Further, the 90th percentile assignment duration of ordnance

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specialties at Fort Carson is 1457 days. The Fort Carson assignment durations provide installation-specific measurements for environmental health assessments when compared to the EPA default exposure durations. For example, the 90th percentile EPA default exposure parameters for outdoor workers of 250 days/year for 25 years are 4.3 times longer than the Fort Carson measured duration of 1457 days (90th percentiles). Use of the EPA 90th percentile default exposure duration would overestimate potential environmental risk. Further, use of the Fort Carson median assignment duration (639 days) for ordnance specialist is 10 times less than the EPA 90th percentile default duration. Use of the EPA default exposure parameters would overestimate the potential risk, which may result in unnecessary allocation of resources for risk mitigation measures. While default exposure parameters, such as exposure durations, are widely applied in environmental assessments, installation-specific exposure parameters are recommended to provide better estimates of environmental risk.

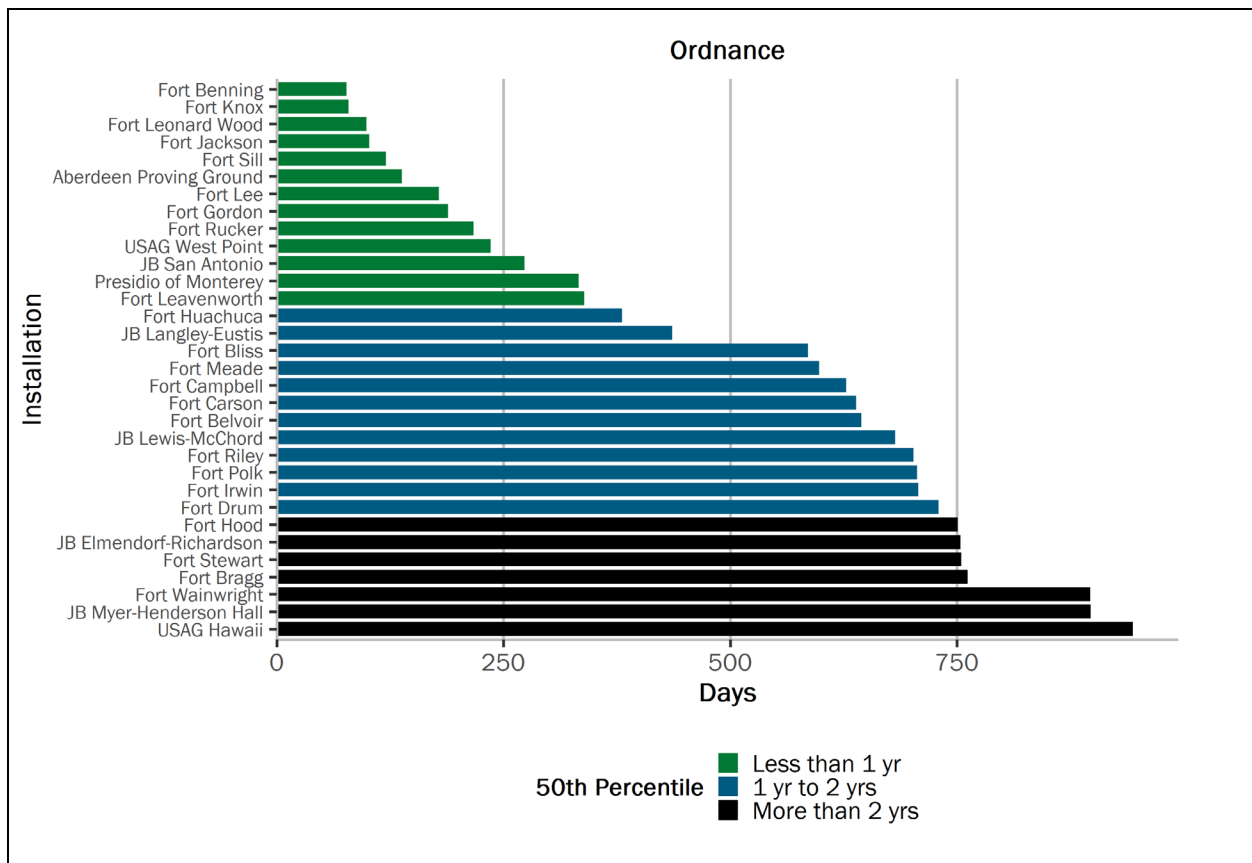


Figure 4. Median Installation Assignment Durations for Ordnance Personnel

5. USE CASE 3—ARMY OCCUPATION/CAREER MANAGEMENT FIELD ASSIGNMENT DURATION AT FORT GORDON

In a review of environmental health data at Fort Gordon, an increase in the rate of heat-related illnesses for personnel in the artillery CMF was observed. The artillery CMF is comprised of artillery tacticians, operators, and crew MOSs, which spend considerable time outdoors performing artillery-related tasks. Upon further investigation of the reported heat-related illness, the environmental health assessors observe similar heat-related impacts in the artillery CMF at other installations, primarily at Fort Stewart, Fort Carson, Fort Campbell, and Fort Bragg. As health assessors evaluate the types of outdoor tasks associated with the artillery occupational specialties, a primary question is the duration of artillery CMF assignments at these five installations. The PTIP analytics provides the assignment durations of personnel in the artillery CMF at 32 CONUS installations (see Figure 5). The artillery CMF assignment duration at Fort Gordon is 219 days (median time), while median durations at Fort Stewart, Fort Carson, Fort Campbell and Fort Bragg are greater than 2 years, indicating a longer duration when compared to most of the other installations in the PTIP study. Health assessors compare outdoor tasks in the artillery CMF at the five installations to determine commonalities that may lead to the increased heat-related impacts. The identification of common outdoor tasks for the artillery CMF along with the assignment durations provide insight to the observed increase in the rate of heat-related impacts. To manage operational heat risk, a plan is designed to more closely monitor outdoor tasks of personnel in the artillery CMF and to adjust assignment durations at these five installations to reduce heat-related impacts to personnel.

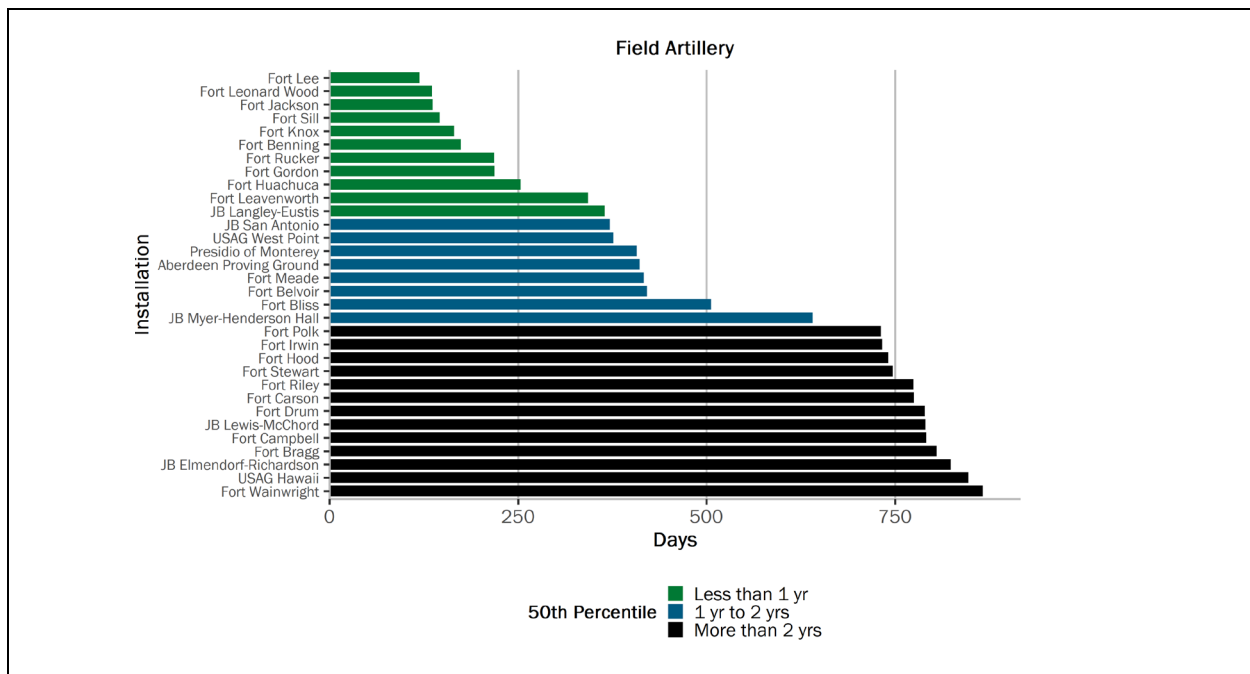


Figure 5. Median Installation Assignment Durations for Field Artillery Personnel