OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND
READINESS

The Honorable Roger F. Wicker
Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510

JUN - 5 2025

Dear Mr. Chairman:

The Department's response to section 751 of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116–283), "Study on Exposure to Toxic Substances at Karshi-Khanabad Air Base, Uzbekistan," is enclosed.

This report covers the findings of an independent 2-year study led by experts at Johns Hopkins University's Applied Physics Laboratory and Bloomberg School of Public Health. The study analyzed morbidity risk based on hazards reported in Karshi-Khanabad Air Base (K2) environmental site assessments and long-term health outcomes that the external study team determined could plausibly be associated with those potential exposures. The study examined eight cancer outcomes in Service members deployed to K2 between October 2001 and December 2005, compared to a larger cohort of Service members who deployed elsewhere outside of the United States during that period. As captured in the report, the study found no K2 deployment-related associations for seven health outcomes and one possible association with non-Hodgkin's lymphoma among Service members deployed to K2 for 180 days or more.

Thank you for your continued strong support for the health and well-being of our Service members. I am sending a similar letter to the Committee on Armed Services of the House of Representatives.

Sincerely,

[redacted]

Timothy D. Dill
Performing the Duties of the Deputy Under
Secretary of Defense for Personnel and
Readiness

Enclosure:
As stated

cc:
The Honorable Jack Reed
Ranking Member

[redacted]

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND
READINESS

The Honorable Mike D. Rogers
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

JUN - 5 2025

Dear Mr. Chairman:

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Sincerely,

[redacted]

Timothy D. Dill
Performing the Duties of the Deputy Under
Secretary of Defense for Personnel and
Readiness

Enclosure:
As stated

cc:
The Honorable Adam Smith
Ranking Member

[redacted]

Report to the Committees on Armed Services of the Senate and the House of Representatives

Study on Exposure to Toxic Substances at Karshi-Khanabad Air Base, Uzbekistan

June 2025

The estimated cost of this report or study for the Department of Defense is approximately $2,050,000 in Fiscal Years 2021-2025. This includes $2,048,000 in expenses for the independent study and $2,500 in DoD labor for report preparation.
Generated on: 2025May30 RefID: 1-A74F854

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Executive Summary

This report is in response to section 751(b) of the William M. (Mac) Thornberry National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2021 (Public Law 116–283), "Study on Exposure to Toxic Substances at Karshi-Khanabad Air Base, Uzbekistan." The section 751 mandated study of potential exposures to toxic substances for Service members deployed to Karshi-Khanabad Air Base (henceforth referred to as "K2") between October 2001 and December 2005.

The Department of Defense (DoD) has previously submitted reporting on types and levels of environmental hazards found at K2 and exposure-associated mortality risk for Service members deployed to K2 (in which no association was found). This report further examines health consequences for Service members and is based on an independent 2-year study led by the Johns Hopkins University's Applied Physics Laboratory (APL) and Bloomberg School of Public Health, utilizing data from both DoD and the Department of Veterans Affairs (VA).

It was designed as a deep study of eight specific conditions scoped to meet scientific standards for plausible associations between K2-related environmental exposures with sufficient rigor to assess such associations. While the study can identify potential associations, it is unable to determine whether exposures caused a given condition, largely because of the lack of individualized environmental exposures data. The APL research team found no K2 exposure-related associations for seven conditions. For one condition, non-Hodgkin's lymphoma, the study identified a possible association: among those deployed to K2 for 180 days or more, the odds of developing non-Hodgkin's lymphoma were roughly 78 percent higher compared to those deployed elsewhere.

While additional, longer-term surveillance and assessment of health outcomes among the population deployed to K2 during this time period is possible, and will be conducted by the VA, it is the Department's assessment that the desired certainty around potential causal relationships from environmental exposures at K2 will continue to be constrained by lack of individual-level exposure information. While partnering with the VA to optimize care for Service members and veterans who served at K2 regardless of the cause of any morbidity they experience, the DoD also remains focused on generating more granular exposure and health data in future operations.

NDAA Tasking

Section 751 of the NDAA for FY 2021, contained the following tasking:

> **SEC. 751. STUDY ON EXPOSURE TO TOXIC SUBSTANCES AT KARSHI-KHANABAD AIR BASE, UZBEKISTAN.**
>
> (a) Study.—
>
> (1) In general.—The Secretary of Defense shall conduct a study on exposure to toxic substances by members of the Armed Forces deployed to Karshi-Khanabad Air Base, Uzbekistan, at any time during the period beginning on October 1, 2001, and ending on December 31, 2005.

(2) Matters included.—The study under paragraph (1) shall include the following:

(A) An assessment regarding the conditions of Karshi-Khanabad Air Base, Uzbekistan, during the period beginning on October 1, 2001, and ending on December 31, 2005, including an identification of any toxic substances contaminating the Air Base during such period.

(B) An epidemiological study of the health consequences of members of the Armed Forces deployed to the Air Base at any time during such period.

(C) An assessment of any association between exposure to toxic substances identified under subparagraph (A) and the health consequences studied under subparagraph (B).

(b) Report.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the Committees on Armed Services of the House of Representatives and the Senate a report on the results of the study under subsection (a).

Notably, an "Executive Order on Care of Veterans with Service In Uzbekistan" was signed by the President of the United States on January 19, 2021,[1] reinforcing the study request with additional specifications on the nature of potential exposures and the rigor of epidemiological study of associations.

Background

The K2 site in Uzbekistan was utilized by the U.S. military from October 2001 through December 2005 as a staging and support air base in support of Operation ENDURING FREEDOM in Afghanistan. It was originally constructed by the former Soviet Union to facilitate refueling for their military operations in Afghanistan and was abandoned when those operations ceased. Environmental surveys conducted before and during K2's utilization as a U.S. base identified a series of potential environmental hazards resulting from jet fuel, depleted uranium, and asbestos — all below established risk thresholds — as well as airborne particulate matter. Pursuant to section 751of the NDAA for FY 2021, environmental assessments from 2001, 2002, and 2004 have been declassified[2] and a summary of environmental hazards identified is given in Table S1. During K2 utilization and in the years since, DoD informed occupants of the hazards and took immediate steps to remediate hazards, consistent with best practices at the time.

Of the approximately 15,000 Service members who were deployed to K2 between 2001 and 2005, some Service members have raised health concerns that they have attributed to the environmental conditions at K2. To address these concerns, and acknowledging the value of a stronger empirical understanding of long-term health effects of exposures, the U.S. Special Operations Command commissioned the Army Public Health Command to conduct a study of exposure-related health outcomes in 2014-2015.[3] This initial DoD study, while limited by the

[1] https://trumpwhitehouse.archives.gov/presidential-actions/executive-order-care-veterans-service-uzbekistan/.
[2] https://ph.health.mil/topics/envirohealth/hrasm/Pages/K2-Airbase-Exposures.aspx.
[3] https://pubmed.ncbi.nlm.nih.gov/26276948/.

lack of individual exposure data and a relatively short time since exposure for development of chronic conditions, found preliminary evidence of potentially elevated risk of malignant melanoma and neoplasms of lymphatic and hemopoietic tissues.

Following this initial study, policymakers issued the NDAA for FY 2021. As a first step in DoD's response to paragraphs (a)(2)(A) and (a)(2)(b) of section 751, the Armed Forces Health Surveillance Division of the Defense Health Agency conducted a study, completed in 2022, to assess whether K2 deployment increased mortality risk. The study compared the relative all-cause mortality rates of those who deployed to K2 to those Service members who could have deployed but did not (a population of over 3 million). It found no significant association between K2 deployment and increased all-cause mortality risk.

In addition to building on those prior DoD studies, the latest study described herein complements ongoing VA-led efforts including the K2 Surveillance Program (K2SP) and various community engagement activities. To date, the VA K2SP has found no evidence of increased mortality or morbidity (across a broad set of 57 diseases) associated with K2 deployment. VA surveillance is expected to continue for the next 10+ years to continually assess the possibility of longer-term associations.

Beyond studying exposure and health risks, policymakers have also given renewed attention to ensuring that veterans who served at K2 have access to adequate health care and benefits. The passage of the Sergeant First Class Heath Robinson Honoring our Promise to Address Comprehensive Toxics Act of 2022 and related actions taken by the VA facilitate such access.

Study Strategy and Approach

To enable independence from the possibility of influence on, or perceived conflict of interest on, the scientific process while complementing prior and ongoing studies by the DoD and VA, DoD considered it critical to commission an independent study of potentially exposure-associated health consequences. For this purpose, DoD contracted the Applied Physics Laboratory at Johns Hopkins University, who partnered with Johns Hopkins University's Bloomberg School of Public Health and also drew extensively upon the subject-matter expertise of the VA Maryland Health Care System, and the Baltimore VA Medical Center's Geriatric Research, Education and Clinical Center.

After examining the existing body of evidence and considering the concerns and requests of Service members and policymakers, the APL team elected to conduct a study that was relatively narrow and deep compared to other studies. They designed the study to examine a set of eight cancer outcomes for potential K2 exposure associations. The interdisciplinary research team made a series of study design choices to navigate tradeoffs to the scope and power of the study; these choices and their limitations are outlined below.

Overall Design and Study Population Selection

To meaningfully compare K2 versus other deployed populations, the APL team conducted what is known as a nested case-control study, a type of observational design specifically suited to

assess exposure-disease associations for health outcomes when there is only a statistically small number of cases within the study population. As a comparison to the K2 population, the researchers needed to look at a relatively large number of controls — individuals of the same sex, similar age, and in this case similar patterns of health system usage — per case of each health condition across the whole population; the researchers chose to examine 100 controls per case.

The APL team drew controls from a population of over 600,000 Service members who were deployed anywhere outside the continental United States (OCONUS), other than K2, during the same October 2001-December 2005 time period. Information on the K2 population and this overall cohort are shown in Table S2. There are some important differences between the overall characteristics of these two groups (e.g., there were primarily Air Force and Army members at K2), so the researchers controlled for these differences in all comparisons they examined.

Data Sources and Scope

With support from DoD and VA, the study team integrated DoD Service member information (including deployment/service records and demographics) maintained by the Defense Manpower Data Center (DMDC) with electronic medical records (EMRs) from DoD TRICARE and VA for the entire cohort as defined above. They also integrated a validated list of 15,031 Service members who had been deployed to K2 as identified by the United States Central Command, DMDC, and the Veterans Health Administration. The cohort was adjusted slightly to exclude those for whom key data was missing; the final cohort selection after filtering for data availability is shown in Figure S1.

When interpreting this study, it is important to note key limitations of these data:

- Large-scale analysis of EMRs relies primarily on administrative and billing data, which have inherent limitations. Other pieces of information like family history, body mass index, alcohol/tobacco use, and full occupational and deployment exposure history are not consistently available within EMRs and could have made for important inputs and adjustments to the analysis.

- Some Service members, in particular members of the National Guard and Reserve, sought care outside of the DoD and VA systems (i.e., through civilian health care), so this dataset is not fully exhaustive of capturing all health outcomes.

- In addition, as previously noted, only site-level environmental data was available, not individual exposure data, creating further limitations on the study of associations and precluding the assessment of any causal relationships.

- The records covered a period of over two decades, from initial deployment in 2001 through the end of 2022. As the latency period—the time between exposure and the appearance of disease symptoms—for some health outcomes can stretch for several decades, long-term studies like those planned by the VA K2SP are important.

Outcome Selection

In Table S1, the APL team independently compiled a list of potential health consequences documented in the literature as potentially associated with any of the types of environmental exposures found at K2 (per prior DoD reports). They then compared the (relatively low) levels/duration of the exposures with the levels/duration required to increase risk of different types of health effects. This led to prioritizing study of cancers, which can be associated with *any* level/duration of exposure, over many other important health conditions (e.g., cardiovascular, neurologic, neurodegenerative, renal, and respiratory health effects), which typically require high-concentration and/or long-term exposures that were very unlikely to have occurred at K2.

The APL team ultimately selected eight outcomes to study: malignant cancers of the: 1) colon and rectum; 2) liver; 3) pancreas; 4) prostate; 5) urinary tract (including bladder, kidney, and ureter); 6) brain; as well as 7) leukemia and 8) non-Hodgkin's lymphoma.

Analytic Approach

The analysis used conditional logistic regression, a statistical method for comparing risk levels, to determine whether the odds of developing a disease were higher for those deployed to K2 versus elsewhere OCONUS, and how confident the researchers were in that assessment. Odds ratios higher than 1, with a confidence interval fully above 1, generally signify the possibility of a K2 exposure-associated risk.

The analysis also accounted for the timelines of exposure and disease in three important ways:

- *Duration of deployment:* Longer deployments to K2 would be expected to cause higher health risk for any condition that is associated with environmental exposure, so length of deployment was considered as a variable.

- *Timing of deployment timeline:* Deployments that occurred prior to completion of site remediation efforts could potentially represent higher levels of exposure, so the analysis considered when the Service members were deployed to K2 relative to when remediation activities were completed.

- *Latency periods:* Because it often takes years for an exposure-related risk to manifest in disease symptoms (and indeed, health conditions emerging shortly after exposure are unlikely to be associated), the researchers added a dimension to the analysis where they examined different lag periods between exposures and diagnoses, from 0 to 15 years.

Findings

Population and Epidemiological Overview

The key study population included 14,469 Service members who deployed to K2 between October 2001 and December 2005. Comparisons were drawn to a broader cohort of 618,992 Service members who deployed anywhere OCONUS during the same period.

Notably, the K2 population consisted of primarily Air Force (61.2 percent) and Army (33.3 percent) personnel. Most (63 percent) deployed once to K2, with substantial variation in lengths of deployment: 3 percent spent <28 days, 25 percent spent 28-89 days, 36 percent spent 90-179 days, and 37 percent spent 180 days or more at K2. As shown in Table S2, the K2 population had some important differences from the broader cohort, such as overall Service distribution and age; these factors were controlled for when doing comparative analyses.

Tables S3a-c include a detailed breakdown of cases and incidence rates among Service members deployed to K2 and elsewhere OCONUS by age, Service, and other categories.

Assessment of Exposure-Related Associations

Table 1 below summarizes the total number of cases identified for each of the eight health outcomes among the K2-deployed population, along with the odds ratios (and associated confidence intervals) compared to those who were deployed elsewhere OCONUS.

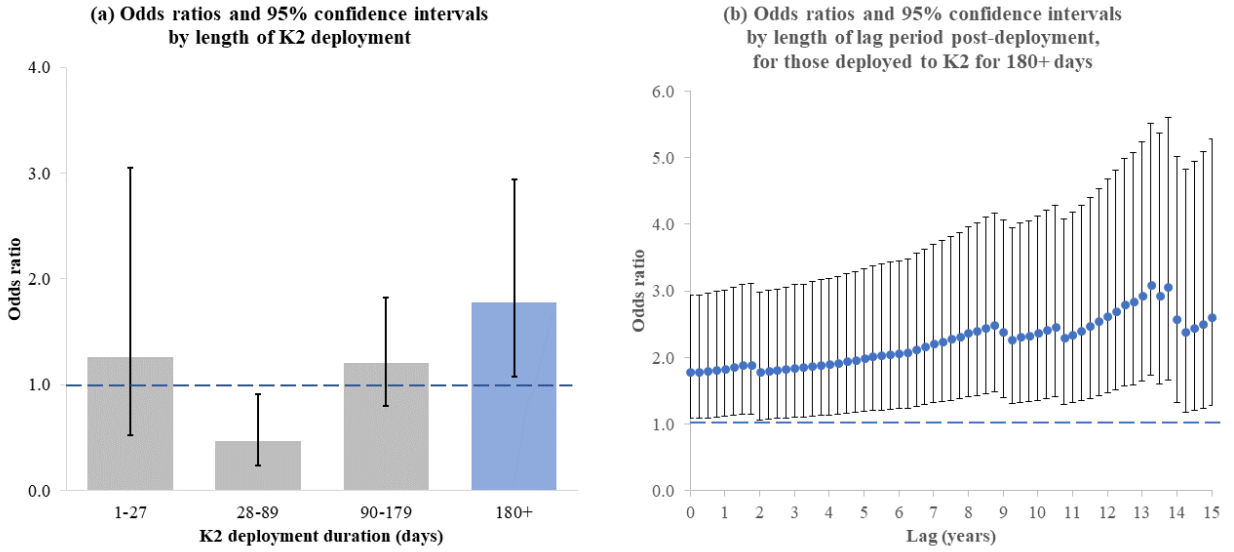
Table 1: Health outcomes and associated odds ratios among Service members deployed to K2, October 2001-December 2005 (n=14,469)

Health outcome (cancers)	Total cases	Odds ratio (confidence interval)
Colorectal	49	0.82 (0.60, 1.12)
Liver	2	0.61 (0.15, 2.50)
Pancreatic	13	1.04 (0.60, 1.83)
Prostate	178	1.03 (0.88, 1.20)
Urinary tract	49	0.73 (0.54, 0.99)
Brain	14	1.09 (0.62, 1.91)
Leukemia	19	0.96 (0.59, 1.54)
Non-Hodgkin's lymphoma	60	1.04 (0.79, 1.38)

Table S4 provides a full overview of the cases and incidence rates among the broader OCONUS-deployed population, as well as the above odds ratios broken down by additional analytic variables. For seven of the eight outcomes — colorectal cancer, liver cancer, pancreatic cancer, prostate cancer, urinary tract cancers, brain cancers, and leukemia — the researchers found no evidence of association between K2 deployment and health risk. This was the case regardless of the duration or the lag period between exposure and diagnosis. For all outcomes, the timing of the exposure (roughly pre-, during, or post-remediation) also had no impact on risk.

In one condition, non-Hodgkin's lymphoma, the results indicated a possible association with K2 deployment. While there was not a statistically significant association among those deployed for less than 180 days, for those deployed to K2 for 180 days or more, the odds of developing non-Hodgkin's lymphoma were roughly 78 percent higher compared to those deployed elsewhere (see blue bar in Figure 1(a) below). There is uncertainty associated with this finding: as shown below, the confidence intervals spanned between an 8 percent and 194 percent increase in odds, suggesting a need for cautious interpretation. However, the researchers also found that the odds ratio among those deployed to K2 for 180 days or more increased when they accounted for longer potential latency periods up through 13 years (see Figure 1(b) below) and following additional case validation steps to remove potential false-positive cases, reinforcing the possibility of an association. The researchers deemed such an association plausible given the known presence of jet fuel and occupational solvents at K2, and potential exposure to burn pits near K2.

Figure 1: Non-Hodgkin's lymphoma findings: Odds ratios for those deployed to K2 versus elsewhere OCONUS, by deployment and lag periods



Conclusions and Additional Considerations

This study found no evidence of association between K2 deployment and health risk for seven of the eight outcomes evaluated. The results indicated a possible association with K2 deployment for one condition, non-Hodgkin's lymphoma. Most specifically, for those deployed to K2 for 180 days or more, the odds of developing non-Hodgkin's lymphoma were roughly 78 percent higher for those deployed to K2 versus elsewhere OCONUS.

DoD, in collaboration with VA and other stakeholders, will take appropriate steps to better understand the 60 cases of non-Hodgkin's lymphoma among Service members deployed to K2 and integrate insights from this study, and other efforts, into future policy and activities. As

discussed below, DoD will also continue its efforts to facilitate access to care and availability of high-quality data.

The Department also continues to prioritize comprehensive exposure monitoring and other efforts to improve access to data for healthcare providers and researchers seeking to enhance the scientific body of knowledge. Core efforts in this area include:

- *Generating individual-level exposure data:* DoD is assessing and piloting new technologies, like wearable sensors, that can generate individual exposure data and provide a more comprehensive understanding of Service member exposures.

- *Self-reporting of burn pit exposures:* DoD and VA have established a registry that enables self-reporting of exposures and health consequences from burn pits. Service members who were deployed at K2 are eligible.

- *Better integration of environmental exposure data in healthcare:* The Defense Occupational and Environmental Health Readiness System – Industrial Hygiene (DOEHRS-IH) now captures and structures information about potential exposures among Service members, including registry data, incident reports, periodic monitoring summaries, and assessments of exposure pathways and industrial hygiene. DoD has also established the Individual Longitudinal Exposure Record, an online resource that draws upon DOEHRS and other sources to give providers information about a Service member's known exposures and inform individualized health care.

- *Integrating some civilian healthcare data:* DoD has begun to integrate data from State civilian cancer registries, which will further enable study of long-term exposure-related cancer outcomes, including among Service members who seek care outside DoD and VA health care systems.

- *Modernizing DoD's health information platform:* DoD is modernizing its biological and health data platform to better integrate and glean greater insights from the broader array of data sources that it anticipates being available moving forward.

Taken together, these activities will enable the Department to better monitor exposures as well as study and mitigate long-term health effects in future operations.

Supplemental Tables and Figures

All data and analysis shown in this section was produced by the independent study team led by Johns Hopkins University's Applied Physics Lab and Bloomberg School of Public Health.

Table S1: Selected measured environmental hazards at K2 of possible relevant health outcomes, with sample source, concentration observed, available guideline, date(s) of sampling, and potential health effects

Environmental hazard	Sample	Documented concentrations[4]	Guideline (standard)	Sample date	Potential health effects as listed in source documents[5]
1,2,4-Trimethylbenzene	Air	4.3 mg/m^3 (maximum concentration) (1)	3.06 mg/m^3 (1-yr MEG[6]) (1)	27 Oct – 27 Nov 2001	Anemia (1); decreased clotting time (21); pulmonary toxicity (21)
	Soil gas	97 mg/m^3 (maximum concentration) (1)	123 mg/m^3 (8-hr TWA[7]) (1)	27 Oct – 27 Nov 2001	Anemia (1); central nervous system effects (22)
1,3,5-Trimethylbenzene	Soil	1.7 mg/kg (maximum detection) (14)	1.13E+01 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	Central nervous system impairment (23); hematologic effects (23)
2-Methylnaphthalene	Soil	16.2 mg/kg (maximum detection) (14)	5.20E+01 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	Bladder cancer (23)
8-hour overnight dosimetry sound level		peak 141.7 (13)	85dBA (action level 2002) (13)	12 Jun 2002	Threshold shift/hearing loss
48-hour dosimetry sound level		TWA 89.1dBA, peak 147.6 (13)	85dBA (action level 2002) (13)	10-12 Jun 2002	Threshold shift/hearing loss
Asbestos	Bulk	5% (1 sample) (13)	1% (OSHA standard 2002) (13)	5 Jun 2002	Mesothelioma (24); lung cancer (24); asbestosis (24); gastrointestinal tract, kidney and throat (larynx or oropharynx) cancer (24); pleural effusions (24)
Benzene	Soil gas	270 mg/m^3 (maximum concentration) (1)	160 mg/m^3 (1-hr MEG) (1)	27 Oct – 27 Nov 2001	Bone marrow depression (1); leukemia (1); cancer (1)
Bis(2-ethylhexyl) phthalate	Soil	129 mg/kg (maximum detection) (14)	3.54+04 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	
Boron	Water	0.47 mg/L (1)	0.4 mg/m^3 (Long-term MEG 15 L/day) (1)	27 Oct – 27 Nov 2001	Central nervous system and liver effects (1); decreased fetal weight (21)

[4] Concentrations are listed as documented in environmental assessments conducted at K2. Documents do not include measures of concentration distributions. Time-weighted averages (TWAs) were frequently not documented.

[5] Potential health outcomes are listed as found in K2 environmental assessments with reference to military exposure guidelines, occupational exposure guides, and medical and academic literature. This list is not exhaustive and does not differentiate effects that may result from short- vs. long-term exposure. Additionally, many of the health conditions listed do not align with specific medical diagnoses (for example, central nervous system impairment, decreased weight) or are insufficiently specific (for example, "cancer", "gastric effects", "liver effects", etc.).

[6] Military exposure guidelines (TG230).

[7] Time-weighted average.

Environmental hazard	Sample	Documented concentrations[4]	Guideline (standard)	Sample date	Potential health effects as listed in source documents[5]
Copper	Water	0.2 mg/L (12)	0.2 mg/L (TG230 15 L/day) (12)	Nov 2001	Gastric effects (25)
Di-n-butylphthalate[8]	Soil	19.5 mg/kg (maximum detection) (14)	2.12E+05 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	Testicular damage (25); eye and upper respiratory tract damage (25)
Ethylbenzene	Soil gas	177 mg/m^3 (maximum concentration) (1)	10.5 mg/m^3 (14-day MEG) (1)	27 Oct – 27 Nov 2001	Cancer (1); ototoxicity (25); kidney effects (25); central nervous system impairment (25)
	Soil	0.51 mg/kg (maximum detection) (14)	2.25E+03 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	
Kerosene	Air	66 mg/m^3 (maximum detection) (14)	3 mg/m^3 (1-yr MEG) (1)	6 Jun – 20 Jul 2002	Decreased blood glucose (21); upper respiratory tract irritation (21); skin irritation (21); central nervous system impairment (21)
Kerosene fraction	Air	63.55 mg/m^3 (maximum concentration) (1)		27 Oct – 27 Nov 2001	
Lead based paint	Bulk	11% (1 sample) (13)	0.5% (HUD Title x Section 1017) (13)	5 Jun 2002	High blood pressure (26); joint and muscle pain (26); headache (26); abdominal pain (26); mood disorders (26); reduced sperm count and abnormal sperm (26); miscarriage, stillbirth or premature birth in pregnant women (26)
Lead	Water	0.0233 mg/L (12)	0.015 mg/L (USEPA MCL 5L/day) (12)	Nov 2001	Cardiovascular effects (increased blood pressure and incidence of hypertension) (27); decreased kidney function (27); reproductive problems (in both men and women) (27)
		0.051 mg/L (28)	0.015 mg/L (MEGs 2004) (28)	31 Aug – 11 Sep 2004	
Methylene chloride[9]	Soil	240 mg/kg (maximum concentration) (1)	21 mg/kg (PRG guideline 2001) (1)	27 Oct – 27 Nov 2001	Cancer (1); central nervous system depression (29); liver disfunction (29); behavioral alterations and retarded development in offspring (29)
Naphthalene	Soil	12.7 mg/kg (maximum detection) (14)	2.60E+03 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	Upper respiratory tract irritation (23); cataracts (23); hemolytic anemia (23)

[8] Also known as dibutyl phthalate.

[9] Synonyms include dichloromethane, methylene bichloride, methane dichloride, and methylenedichloride (29).

Environmental hazard	Sample	Documented concentrations[4]	Guideline (standard)	Sample date	Potential health effects as listed in source documents[5]
Phenanthrene	Soil	11.5 mg/kg (maximum detection) (14)	2.80E+03 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	Decreased body weight (21)
PM10	Air	0.394 mg/m^3 (maximum concentration) (1)	0.074 mg/m^3 (1-yr MEG) (1)	27 Oct – 27 Nov 2001	Worsening of respiratory diseases (asthma and chronic obstructive pulmonary disease) (30); lung cancer (30); heart attacks (31); decreased lung function (31)
		0.702 mg/m^3 (maximum detection) (13)	0.07 mg/m^3 (MEGs 2002) (13)	31 May – 14 Jun 2002	
		130 µg/m^3 (average concentration across samples) (28)	70 µg/m^3 (MEGs 2004) (28)	31 Aug – 11 Sep 2004	
Propylbenzene	Soil gas	69 mg/m^3 (maximum concentration) (1)	0.025 mg/m^3 (1-yr MEG) (1)	27 Oct – 27 Nov 2001	Upper respiratory tract irritation (32)
Tetrachloroethylene[10]	Air	0.0061 mg/m^3 (maximum detection) (13)	0.0033 mg/m^3 (MEGs 2002) (13)	31 May – 14 Jun 2002	Increase cancer rates (13)
Toluene	Air	5.52 µg/m^3 (14)	0.754 µg/m^3 (1-hr MEG 2003) (33)	6 Jun – 20 Jul 2002	Neurological effects (21); central nervous systems (23); visual and hearing impairment (23); female reproductive systems effects (23); pregnancy loss (23); ototoxicity (23)
	Soil	0.31 mg/kg (maximum detection) (14)	2.75E+03 mg/kg (1-year negligible MEG 2013) (21)	6 Jun – 20 Jul 2002	Central nervous systems, visual, and hearing impairment (23); female reproductive systems effects (23); pregnancy loss (23); ototoxicity (23)
Uranium	Soil	148 mg/kg (1 sample) (13)	50 mg/kg (action level 2002) (13)	5 Jun 2002	Kidney damage (34)
Xylene, m/p-	Air	5.77 µg/m^3 (14)	0.65 µg/m^3 (1-hr MEG 2003) (33)	6 Jun – 20 Jul 2002	Impaired motor coordination (21); upper respiratory tract irritation (21); central nervous system impairment (21); eye irritation (21)
Xylenes	Soil gas	569 mg/m^3 (maximum concentration) (1)	435 mg/m^3 (8-hr MEG) (1)	27 Oct – 27 Nov 2001	Dermatitis (1); liver and kidney damage (1); cardiac arrhythmias (1); reproductive and developmental effects (1)
	Soil	270 mg/kg (maximum concentration) (1)	210 mg/kg (MEGs 2001) (1)	27 Oct – 27 Nov 2001	

[10] Also known as perchloroethylene (21).

References Cited in Table S1

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Table S2: Characteristics of cohort overall and by those who were ever and never deployed to K2

	Total Cohort (N or mean)	% or IQR	Ever at K2 (N or mean)	% or IQR	Never at K2 (N or mean)	% or IQR
Total N	618,992		14,469		604,523	
Age on 2005-12-31 (yrs)	30.0	(24.0, 35.0)	34.6	(26.0, 39.0)	30.0	(24.0, 35.0)
Date of first deployment	2003-10-31	(2003-01-29, 2004-09-25)	2002-12-27	(2002-01-01, 2003-07-24)	2003-11-07	(2003-01-29, 2004-09-25)
Days deployed during POI	212	(100, 309)	170	(89, 217)	213	(101, 309)
Sex						
- Female	63,265	10.2%	1,348	9.3%	61,917	10.2%
- Male	555,727	89.8%	13,121	90.7%	542,606	89.8%
Encounter Phenotype						
- Low Freq, Short Duration	75,924	12.3%	2,278	15.7%	73,646	12.2%
- Low Freq, Medium Duration	56,281	9.1%	1,533	10.6%	54,748	9.1%
- Low Freq, Long Duration	34,302	5.5%	841	5.8%	33,461	5.5%
- Medium Freq, Short Duration	39,326	6.4%	1,023	7.1%	38,303	6.3%
- Medium Freq, Medium Duration	88,989	14.4%	1,936	13.4%	87,053	14.4%
- Medium Freq, Long Duration	89,165	14.4%	1,655	11.4%	87,510	14.5%
- High Freq, Short Duration	12,197	2.0%	279	1.9%	11,918	2.0%
- High Freq, Medium Duration	39,862	6.4%	782	5.4%	39,080	6.5%
- High Freq, Long Duration	45,895	7.4%	717	5.0%	45,178	7.5%
- DOD Records Only	137,051	22.1%	3,425	23.7%	133,626	22.1%
Race/Ethnicity						
- Asian	17,633	2.9%	223	1.6%	17,410	3.0%
- Black	99,039	16.4%	1,894	13.9%	97,145	16.5%
- Hispanic	66,721	11.1%	791	5.8%	65,930	11.2%
- Native American	7,678	1.3%	129	0.9%	7,549	1.3%
- Native Hawaii/Islander	9,919	1.6%	231	1.7%	9,688	1.6%
- White, non-Hispanic	401,805	66.7%	10,390	76.1%	391,415	66.4%
Service Branch						
- Air Force	153,446	24.8%	8,855	61.2%	144,591	23.9%
- Army	266,726	43.1%	5,251	36.3%	261,475	43.3%
- Coast Guard	1,694	0.3%	0	0.0%	1,694	0.3%
- Marines	135,783	21.9%	294	2.0%	135,489	22.4%
- Navy	61,334	9.9%	60	0.4%	61,274	10.1%
Grade/Rank						
- E00 – E01	337,404	54.5%	6,447	44.6%	330,957	54.7%
- E02 – E04	202,487	32.7%	4,814	33.3%	197,673	32.7%
- E05 – E10	40,697	6.6%	1,542	10.7%	39,155	6.5%
- O00 – O04	37,376	6.0%	1,636	11.3%	35,740	5.9%
- O05 – O10	315	0.1%	7	0.0%	308	0.1%
- W01 – W04	699	0.1%	14	0.1%	685	0.1%
Component						
- Active Duty	491,824	79.5%	10,419	72.2%	481,405	79.6%
- National Guard	65,630	10.6%	2,890	20.0%	62,740	10.4%
- Reserves	61,446	9.9%	1,120	7.8%	60,326	10.0%

	Total Cohort (N or mean)	% or IQR	Ever at K2 (N or mean)	% or IQR	Never at K2 (N or mean)	% or IQR
Education						
- No high school diploma	5,248	0.9%	36	0.3%	5,212	0.9%
- High school diploma	472,501	78.1%	5,906	50.9%	466,595	78.7%
- Some college	55,442	9.2%	2,877	24.8%	52,565	8.9%
- Bachelor's degree	50,943	8.4%	1,594	13.7%	49,349	8.3%
- Master's degree	19,097	3.2%	1,163	10.0%	17,934	3.0%
- Post-graduate degree	1,455	0.2%	25	0.2%	1,430	0.2%

Missing Data (Covariate: Overall (n, %), K2 Cohort (n, %), Never K2 Cohort (n, %)

- Race/Ethnicity: 16,197 (2.6%), 811 (5.6%), 15,386 (2.5%)
- Service Branch: 9 (0.0%), 9 (0.1%), 0 (0.0%)
- Grade/Rank: 14 (0.0%), 9 (0.1%), 5 (0.0%)
- Component: 92 (0.0%), 40 (0.3%), 52(0.0%)
- Education: 14,306 (2.3%), 2,868 (19.8%), 11,438 (1.9%)

Cohort: all individuals who were deployed to any location outside the United States and its territories between 1 October 2001 and 31 December 2005

Figure S1: Data sources, cohort identification, and availability/source of health encounter information

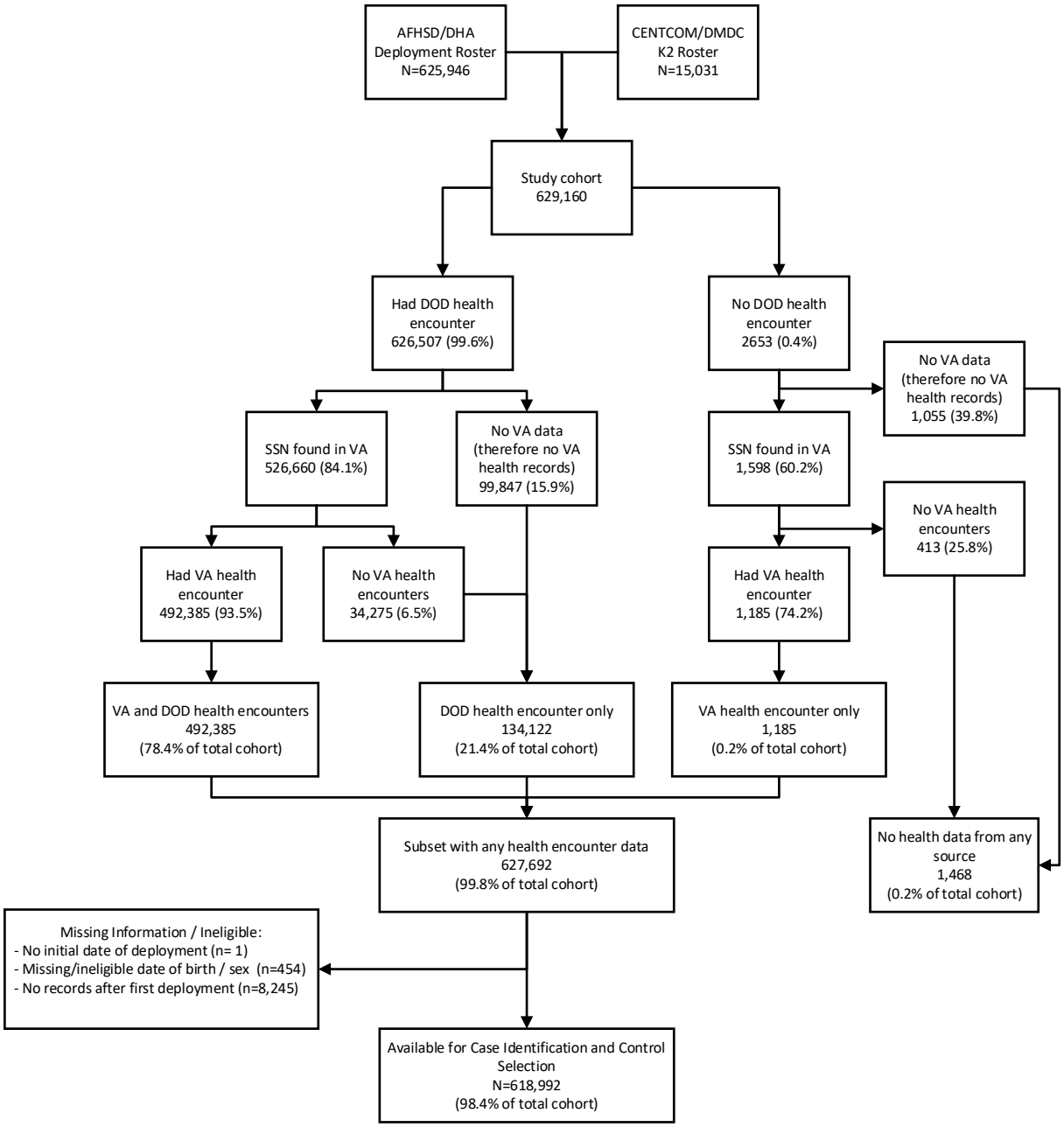

Table S3a: Raw case counts and incidence rates per 10,000 Service members, by K2 status*

	Cohort *(n=618,992)*		K2 *(n=14,469)*		Non K2 *(n=604,523)*	
Outcome	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**
Brain	470	7.59	14	9.68	456	7.54
Colorectal	1,582	25.56	47	32.48	1,533	25.36
Leukemia	725	11.71	19	13.13	706	11.68
Liver	113	1.83	2	1.38	111	1.84
Non-Hodgkin's Lymphoma	1,779	28.74	60	41.47	1,719	28.44
Pancreatic	422	6.82	13	8.98	409	6.77
Prostate	5,223	84.38	177	122.33	5,045	83.45
Urinary Tract	1,942	31.37	44	30.41	1,893	31.31

**All numbers are raw, and do not reflect possible exclusion in analytic datasets where individualized study start dates are considered (i.e. analytic models for parameter estimates remove individuals if their incidence date occurs before date of first deployment).*

Table S3b: Raw case counts and incidence rates per 10,000 Service members by demographics, non K2 population

		Brain		Colorectal		Leukemia		Liver		non-Hodgkin's Lymphoma (NHL)		Pancreatic		Prostate		Urinary Tract	
	Total N	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**
Age Group																	
- <25	243,894	109	4.47	145	5.95	134	5.49	12	0.49	292	11.97	28	1.15	25	1.03	142	5.82
- [25-35)	213,843	152	7.11	409	19.13	192	8.98	20	0.94	468	21.89	73	3.41	321	15.01	437	20.44
- [35, 45)	110,695	132	11.92	645	58.27	225	20.33	32	2.89	573	51.76	161	14.54	2096	189.35	693	62.60
- [45, 55)	31,148	48	15.41	250	80.26	113	36.28	40	12.84	298	95.67	116	37.24	1995	640.49	405	130.02
- >=55	4,938	15	30.38	82	166.06	40	81.00	7	14.18	88	178.21	31	62.78	600	1215.07	144	291.62
Sex																	
- Female	61,917	34	5.49	136	21.96	66	10.66	9	1.45	136	21.96	48	7.75	3	0.48	87	14.05
- Male	542,606	422	7.78	1395	25.71	638	11.76	102	1.88	1583	29.17	361	6.65	5034	92.77	1734	31.96
Encounter Phenotype																	
- Low Freq, Short Duration	73,646	40	5.43	174	23.63	88	11.95	6	0.81	208	28.24	39	5.30	559	75.90	202	27.43
- Low Freq, Medium Duration	54,748	35	6.39	137	25.02	60	10.96	7	1.28	150	27.40	41	7.49	451	82.38	141	25.75
- Low Freq, Long Duration	33,461	17	5.08	67	20.02	27	8.07	2	0.60	74	22.12	10	2.99	285	85.17	98	29.29
- Medium Freq, Short Duration	38,303	36	9.40	76	19.84	35	9.14	6	1.57	100	26.11	29	7.57	207	54.04	92	24.02

		Brain		Colorectal		Leukemia		Liver		non-Hodgkin's Lymphoma (NHL)		Pancreatic		Prostate		Urinary Tract	
	Total N	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**
- Medium Freq, Medium Duration	87,053	71	8.16	220	25.27	85	9.76	17	1.95	230	26.42	58	6.66	683	78.46	243	27.91
- Medium Freq, Long Duration	87,510	54	6.17	179	20.45	74	8.46	15	1.71	255	29.14	43	4.91	963	110.04	282	32.22
- High Freq, Short Duration	11,918	30	25.17	52	43.63	27	22.65	6	5.03	40	33.56	13	10.91	64	53.70	40	33.56
- High Freq, Medium Duration	39,080	53	13.56	174	44.52	92	23.54	15	3.84	174	44.52	49	12.54	391	100.05	189	48.36
- High Freq, Long Duration	45,178	60	13.28	186	41.17	98	21.69	28	6.20	228	50.47	52	11.51	779	172.43	306	67.73
- DOD Records Only	133,626	60	4.49	266	19.91	118	8.83	9	0.67	260	19.46	75	5.61	655	49.02	228	17.06
Race/Ethnicity																	
- Asian	17,410	9	5.17	45	25.85	11	6.32	1	0.57	31	17.81	16	9.19	75	43.08	30	17.23
- Black	97,145	59	6.07	283	29.13	124	12.76	21	2.16	323	33.25	85	8.75	1611	165.83	286	29.44
- Hispanic	65,930	38	5.76	124	18.81	70	10.62	13	1.97	139	21.08	22	3.34	325	49.29	165	25.03
- Native American	7,549	1	1.32	13	17.22	10	13.25	2	2.65	16	21.19	3	3.97	50	66.23	21	27.82
- Native Hawaii/Islander	9,688	0	0.00	15	15.48	9	9.29	2	2.06	15	15.48	8	8.26	31	32.00	23	23.74
- White, non-Hispanic	391,415	334	8.53	1015	25.93	457	11.68	69	1.76	1149	29.36	268	6.85	2807	71.71	1247	31.86
Service Branch																	
- Air Force	144,591	124	8.58	519	35.89	211	14.59	30	2.07	555	38.38	136	9.41	1824	126.15	616	42.60
- Army	261,475	193	7.38	639	24.44	306	11.70	56	2.14	726	27.77	169	6.46	2193	83.87	798	30.52
- Coast Guard	1,694	2	11.81	2	11.81	0	0.00	0	0.00	3	17.71	0	0.00	6	35.42	0	0.00
- Marines	135,489	85	6.27	197	14.54	107	7.90	10	0.74	234	17.27	51	3.76	443	32.70	204	15.06
- Navy	61,274	52	8.49	174	28.40	80	13.06	15	2.45	201	32.80	53	8.65	571	93.19	203	33.13
Grade/Rank																	
- E00 – E01	330,957	183	5.53	474	14.32	265	8.01	30	0.91	609	18.40	102	3.08	483	14.59	504	15.23
- E02 – E04	197,673	169	8.55	591	29.90	236	11.94	37	1.87	571	28.89	142	7.18	1681	85.04	644	32.58
- E05 – E10	39,155	50	12.77	323	82.49	123	31.41	35	8.94	289	73.81	94	24.01	1767	451.28	451	115.18
- O00 – O04	35,740	48	13.43	134	37.49	72	20.15	8	2.24	236	66.03	64	17.91	990	277.00	206	57.64
- O05 – O10	308	3	97.40	4	129.87	5	162.34	0	0.00	8	259.74	1	32.47	46	1493.51	5	162.34
- W01 – W04	685	3	43.80	5	72.99	3	43.80	1	14.60	6	87.59	6	87.59	70	1021.90	11	160.58
Component																	
- Active Duty	481,405	354	7.35	1061	22.04	508	10.55	62	1.29	1235	25.65	256	5.32	2712	56.34	1169	24.28
- National Guard	62,740	55	8.77	262	41.76	120	19.13	28	4.46	274	43.67	73	11.64	1303	207.68	391	62.32
- Reserves	60,326	47	7.79	208	34.48	76	12.60	21	3.48	210	34.81	80	13.26	1022	169.41	261	43.26
Education																	
- No high school diploma	5,212	1	1.92	7	13.43	7	13.43	0	0.00	9	17.27	2	3.84	9	17.27	11	21.11

		Brain		Colorectal		Leukemia		Liver		non-Hodgkin's Lymphoma (NHL)		Pancreatic		Prostate		Urinary Tract	
	Total N	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence
- High school diploma	466,595	305	6.54	962	20.62	433	9.28	68	1.46	1051	22.52	220	4.72	2193	47.00	1078	23.10
- Some college	52,565	50	9.51	253	48.13	114	21.69	22	4.19	248	47.18	65	12.37	1067	202.99	343	65.25
- Bachelor's degree	49,349	60	12.16	185	37.49	88	17.83	14	2.84	212	42.96	64	12.97	868	175.89	216	43.77
- Master's degree	17,934	31	17.29	89	49.63	47	26.21	6	3.35	162	90.33	48	26.76	734	409.28	141	78.62
- Post-graduate degree	1,430	2	13.99	7	48.95	6	41.96	0	0.00	10	69.93	3	20.98	65	454.55	11	76.92

Table S3c: Raw case counts and incidence rates per 10,000 Service members by demographics, K2 population

		Brain		Colorectal		Leukemia		Liver		non-Hodgkin's Lymphoma (NHL)		Pancreatic		Prostate		Urinary Tract	
	Total N	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence	Cases	Incidence
Age Group																	
- <25	2,887	1	3.46	3	10.39	0	0.00	0	0.00	4	13.86	0	0.00	1	3.46	2	6.93
- [25-35)	6,043	7	11.58	12	19.86	5	8.27	1	1.65	20	33.10	1	1.65	7	11.58	15	24.82
- [35, 45)	4,217	5	11.86	25	59.28	9	21.34	1	2.37	21	49.80	4	9.49	72	170.74	15	35.57
- [45, 55)	1,127	1	8.87	8	70.98	4	35.49	0	0.00	14	124.22	6	53.24	72	638.86	14	124.22
- >=55	195	0	0.00	0	0.00	1	51.28	0	0.00	1	51.28	2	102.56	26	1333.33	2	102.56
Sex																	
- Female	1,348	0	0.00	3	22.26	0	0.00	0	0.00	4	29.67	0	0.00	0	0.00	4	29.67
- Male	13,121	14	10.67	45	34.30	19	14.48	2	1.52	56	42.68	13	9.91	178	135.66	44	33.53
Encounter Phenotype																	
- Low Freq, Short Duration	2,278	2	8.78	8	35.12	3	13.17	0	0.00	8	35.12	0	0.00	16	70.24	6	26.34
- Low Freq, Medium Duration	1,533	3	19.57	7	45.66	3	19.57	0	0.00	4	26.09	3	19.57	23	150.03	7	45.66
- Low Freq, Long Duration	841	1	11.89	2	23.78	2	23.78	0	0.00	0	0.00	0	0.00	16	190.25	4	47.56
- Medium Freq, Short Duration	1,023	3	29.33	3	29.33	0	0.00	2	19.55	5	48.88	0	0.00	8	78.20	3	29.33
- Medium Freq, Medium Duration	1,936	1	5.17	5	25.83	4	20.66	0	0.00	12	61.98	1	5.17	29	149.79	10	51.65
- Medium Freq, Long Duration	1,655	1	6.04	2	12.08	0	0.00	0	0.00	9	54.38	2	12.08	29	175.23	5	30.21
- High Freq, Short Duration	279	0	0.00	1	35.84	0	0.00	0	0.00	3	107.53	2	71.68	1	35.84	1	35.84
- High Freq, Medium Duration	782	2	25.58	4	51.15	2	25.58	0	0.00	5	63.94	0	0.00	12	153.45	3	38.36

		Brain		Colorectal		Leukemia		Liver		non-Hodgkin's Lymphoma (NHL)		Pancreatic		Prostate		Urinary Tract	
	Total N	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**	**Cases**	**Incidence**
- High Freq, Long Duration	717	0	0.00	5	69.74	4	55.79	0	0.00	7	97.63	0	0.00	24	334.73	2	27.89
- DOD Records Only	3,425	1	2.92	11	32.12	1	2.92	0	0.00	7	20.44	5	14.60	20	58.39	7	20.44
Race/Ethnicity																	
- Asian	223	0	0.00	1	44.84	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
- Black	1,894	1	5.28	9	47.52	2	10.56	0	0.00	14	73.92	1	5.28	39	205.91	8	42.24
- Hispanic	791	0	0.00	0	0.00	0	0.00	0	0.00	2	25.28	1	12.64	3	37.93	1	12.64
- Native American	129	1	77.52	1	77.52	0	0.00	0	0.00	0	0.00	0	0.00	3	232.56	0	0.00
- Native Hawaii/Islander	231	0	0.00	3	129.87	0	0.00	0	0.00	0	0.00	0	0.00	2	86.58	0	0.00
- White, non-Hispanic	10,390	11	10.59	30	28.87	16	15.40	2	1.92	39	37.54	11	10.59	124	119.35	38	36.57
Service Branch																	
- Air Force	8,855	8	9.03	32	36.14	10	11.29	1	1.13	38	42.91	9	10.16	94	106.15	34	38.40
- Army	5,251	6	11.43	15	28.57	9	17.14	1	1.90	21	39.99	3	5.71	81	154.26	11	20.95
- Coast Guard	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
- Marines	294	0	0.00	0	0.00	0	0.00	0	0.00	1	34.01	1	34.01	2	68.03	2	68.03
- Navy	60	0	0.00	1	166.67	0	0.00	0	0.00	0	0.00	0	0.00	1	166.67	1	166.67
Grade/Rank																	
- E00 – E01	6,447	5	7.76	11	17.06	4	6.20	1	1.55	20	31.02	1	1.55	13	20.16	13	20.16
- E02 – E04	4,814	6	12.46	19	39.47	8	16.62	0	0.00	20	41.55	7	14.54	55	114.25	12	24.93
- E05 – E10	1,542	1	6.49	7	45.40	4	25.94	0	0.00	12	77.82	2	12.97	67	434.50	15	97.28
- O00 – O04	1,636	2	12.22	11	67.24	3	18.34	1	6.11	8	48.90	3	18.34	41	250.61	8	48.90
- O05 – O10	7	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	1428.57	0	0.00
- W01 – W04	14	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	714.29	0	0.00
Component																	
- Active Duty	10,419	11	10.56	33	31.67	12	11.52	1	0.96	38	36.47	7	6.72	94	90.22	30	28.79
- National Guard	2,890	2	6.92	12	41.52	6	20.76	1	3.46	15	51.90	3	10.38	61	211.07	12	41.52
- Reserves	1,120	1	8.93	2	17.86	1	8.93	0	0.00	7	62.50	3	26.79	23	205.36	6	53.57
Education																	
- No high school diploma	36	0	0.00	0	0.00	0	0.00	0	0.00	1	277.78	0	0.00	0	0.00	0	0.00
- High school diploma	5,906	9	15.24	16	27.09	6	10.16	0	0.00	24	40.64	7	11.85	41	69.42	21	35.56
- Some college	2,877	1	3.48	6	20.86	4	13.90	0	0.00	11	38.23	2	6.95	40	139.03	11	38.23
- Bachelor's degree	1,594	0	0.00	4	25.09	0	0.00	1	6.27	5	31.37	1	6.27	25	156.84	6	37.64
- Master's degree	1,163	1	8.60	4	34.39	1	8.60	0	0.00	3	25.80	1	8.60	18	154.77	3	25.80
- Post-graduate degree	25	0	0.00	1	400.00	0	0.00	0	0.00	0	0.00	0	0.00	2	800.00	0	0.00

Table S4: Conditional logistic regression odds ratios and 95% confidence intervals, adjusted*, without lagging exposure

	Brain	Colorectal	Leukemia	Liver	Non-Hodgkin's lymphoma	Pancreatic	Prostate	Urinary Tract
Number of Cases (non K2 /K2)	434 (421/13)	1,503 (1460/43)	683 (665/18)	110 (108/2)	1649 (1595/54)	410 (397/13)	5,020 (4850/170)	1,783 (1740/43)
Number of Controls	44,184	151,251	69,413	11,096	167,039	40,085	506,566	179,768
Ever K2†	1.09	0.82	0.96	0.61	1.04	1.04	1.03	0.73
	(0.62, 1.91)	(0.60, 1.12)	(0.59, 1.54)	(0.15, 2.50)	(0.79, 1.38)	(0.60, 1.83)	(0.88, 1.20)	(0.54, 0.99)
Days at K2†	1.001	0.999	0.999	1.000	1.002	1.000	1.000	0.998
	(0.998, 1.005)	(0.997, 1.001)	(0.996, 1.003)	(0.992, 1.009)	(1.000, 1.003)	(0.996, 1.004)	(0.999, 1.001)	(0.995, 1.000)
Categorical Days at K2†								
(0 - 27)	0.85	1.38	1.17	0.00 (--, --)	1.26	0.84	0.79	0.95
	(0.12, 6.11)	(0.61, 3.10)	(0.29, 4.76)		(0.52, 3.05)	(0.12, 6.05)	(0.43, 1.43)	(0.39, 2.29)
(28 - 89)	0.48	0.72	0.72	0.00 (--, --)	0.47	1.33	1.05	0.70
	(0.12, 1.93)	(0.42, 1.22)	(0.30, 1.74)		(0.24, 0.91)	(0.59, 3.01)	(0.82, 1.35)	(0.43, 1.15)
(90 - 179)	1.53	0.74	1.49	0.94	1.21	0.91	1.11	0.67
	(0.72, 3.27)	(0.44, 1.26)	(0.79, 2.82)	(0.13, 6.91)	(0.80, 1.82)	(0.34, 2.45)	(0.86, 1.42)	(0.39, 1.13)
(180+)	1.48	0.94	0.29	2.27	1.78	0.85	0.95	0.81
	(0.47, 4.66)	(0.47, 1.90)	(0.04, 2.07)	(0.31, 16.73)	(1.08, 2.94)	(0.21, 3.45)	(0.66, 1.36)	(0.40, 1.62)
K2 Phase†								
Pre-2002	2.12	0.64	0.00	0.00	1.47	1.48	0.93	0.41
	(0.67, 6.74)	(0.24, 1.72)	(--, --)	(--, --)	(0.78, 2.76)	(0.36, 6.01)	(0.59, 1.47)	(0.13, 1.29)
Jan to June 2002	0.98	0.71	0.98	0.81	1.10	0.53	1.34	0.73
	(0.36, 2.64)	(0.40, 1.25)	(0.43, 2.19)	(0.11, 5.91)	(0.69, 1.75)	(0.13, 2.15)	(1.04, 1.71)	(0.43, 1.24)
After June 2002	0.93	0.93	1.14	0.54	0.91	1.23	0.89	0.80
	(0.43, 2.11)	(0.63, 1.38)	(0.64, 2.03)	(0.07, 3.93)	(0.62, 1.35)	(0.63, 2.40)	(0.72, 1.11)	(0.54, 1.18)

*Adjusted for age, service, race/ethnicity

† Reference category for all four exposure definitions is the never at K2 group (or 0 days)