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**TITLE:** Investigating Gene-Environment Interactions in Multiple Cohorts of 1990-1991 Gulf War Veterans

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**CONTRACTING ORGANIZATION:** Boston University Medical Campus  
Boston, MA 02118-0000

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# REPORT DOCUMENTATION PAGE

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<b>13. SUPPLEMENTARY NOTES</b>  None			
<b>14. ABSTRACT</b> While the 1990-91 Gulf War was relatively short, military personnel who served in the war have suffered long-lasting health consequences. The constellation of health symptoms known as Gulf War Illness (GWI) affects up to one third of 1991 Gulf War veterans. Epidemiologic studies have consistently identified neurotoxicant exposures as the most prominent risk factors for GWI, but an important question remains concerning why some veterans became ill after the war, while others with similar exposures did not. The most prominent exposures of concern include: 1) prolonged use of pyridostigmine bromide (PB) pills, a carbamate compound, 2) excessive use of pesticides (including organophosphates (OPs) and carbamates) and 3) chemical nerve agents (OPs). These compounds have a shared mechanism of action in that they inhibit acetylcholinesterase (AChE) and alter levels of the neurotransmitter acetylcholine, with potential acute and long-term effects on the brain and nervous system. Genetic variability in veterans' ability to neutralize these compounds has long been hypothesized to explain why some veterans got sick and others remained healthy. The human body produces enzymes that protect against adverse effects of cholinergic toxicants, including the enzyme butyrylcholinesterase (BChE). Recent findings from Steele et al (2015) provided preliminary evidence that veterans with slow-acting BChE genetic variants may have been at dramatically increased risk for GWI (OR = 40.0, p = 0.0005) if they used PB during deployment. An additional enzyme, paraoxonase-1 (PON1), catalyzes the hydrolysis of OPs and has also been suggested as a factor that contributed to differences in vulnerability to Gulf War neurotoxicants in theater. The proposed study will build on these preliminary findings and utilize newly collected and existing data from 4 independent cohorts to provide a detailed evaluation of the			
<b>15. SUBJECT TERMS: NONE LISTED</b>			
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## 1. INTRODUCTION:

**Subject:** The subject of this study is to determine the BChE genotype and phenotype in numerous Gulf War veterans who were involved in multiple cohort studies.

**Purpose:** The purpose of this study is to examine the interaction between genes (BChE and PON1) and environment (exposures in theater) in multiple cohorts of 1990-91 Gulf War veterans.

**Scope:** Biological samples from 834 Gulf War veterans will be analyzed from multiple current and prior studies using stored samples.

## 2. KEYWORDS:

Gulf War, Veterans, Gulf War Illness, Exposure, Pesticides, BChE activity, BChE genotype, PON1 status, PON1 genotype,

## 3. ACCOMPLISHMENTS:

- What were the major goals of this study:

Major Task 1: Obtain IRB approval

Major Task 2: Obtain blood samples from three sites

Major Task 3: Conduct BChE genotypic and phenotypic analyses

Major Task 4: Perform BChE data analyses

Major Task 5: Collect all PON1 data from the four cohorts and merge with BChE and gene-exposure data set.

Major Task 6: Data Analysis for gene-exposure analysis

Major Task 7: Disseminate study results

Major Task 8: Write annual and final reports for DoD

= What was accomplished under these goals: The major goals accomplished during the past year of the study include continue updated IRB and HRPO approvals, addition of Dr. Lea Steele's site in Texas so we can start preliminary analysis, shipping and receiving additional biological samples to the University of Washington, analyzing PON1 and BChE in those samples, creation of a merged dataset for all cohorts. The modified statement of work with information from the original statement of work and the new column added to address the actual timeline of progress can be found below. In the annual report last year task 2 has been extended as not all of the participants have been recruited into the GWIC and Devens cohorts and we were waiting for the last remaining participants to have samples collected. At this time, GWIC is still in a NCE and trying to recruit more subjects but we are moving forward with the samples we have thus far. As a result task 2 being extended tasks 3, 4 and 5 had also been extended. Task 6 and 7 have not yet been addressed in this study but are part of the plan for this upcoming year.

Major Task 1: Obtain IRB approval

Local IRB approvals are still up-to-date at each of the local sites as well as from HRPO. During this year we added Dr. Lea Steele's Texas site to our local IRB and HRPO approvals so as to be able to work on the data analysis.

(rough percent completed = 100%)

**Major Task 2: Obtain blood samples from three sites**

We have currently obtained, shipped and received biological samples from the GW veterans that will be included in this study and these samples are now located at the University of Washington.

(rough percent completed = 98% as we might still be able to get a few more GWIC subjects shipped if the subjects are seen in the next month or two as part of GWIC)

**Major Task 3: Conduct BChE genotypic and phenotypic analyses**

Samples from all GW veterans that will be part of this study have been analyzed and toxic PON1 activity from these subjects has been determined. We have a subsample of subjects for which we have also run non-toxic PON1 analysis. This will result in a publication showing that PON1 analysis can be performed using the non-toxic assay. BChE genotyping and phenotyping has been conducted on the majority of subjects and during this NCE the remaining samples will be analyzed.

(rough percent complete = 65%. N= ~360 samples have phenotypic and genotype data; A total of N=366 non-toxic PON1 analysis is completed and merged and the full sample does not need non-toxic assay to be performed as it is a comparison study of methods)

**Major Task 4: Perform BChE data analyses**

Data results from PON1 and BChE have been merged into the large dataset that includes the demographic, exposure and case status of each individual. As we are still awaiting results for from task 3 we will be conducting these analyses this year once we have our final dataset that includes all BChE data.

(rough percent complete = 40% as we have collected what University of Washington has completed but they still have ~30 more samples available to analyze)

**Major Task 5: Collect all PON1 data from the four cohorts and merge with BChE and gene-exposure data set**

A large portion of this year has been dedicated to collecting the demographic and exposure data from each of the cohorts and getting them merged as each cohort ask many questions in different ways. We continue to work through some challenges related to missing data that allows us to define case status and we will continue this work throughout this year.

(rough percent complete = 70% as N=523 subjects have toxic PON1 status completed and merged into the dataset).

**Major Task 8: Write annual and final reports for DoD**

The PI has completed the annual report for the third year of the study.

**Statement of Work**

<b>Research Specific Tasks:</b>	<b>Timeline (Initial)</b>	<b>Timeline (updated 10/26/2020)</b>
<b>Major Task 1: Obtain IRB approval</b>	months	Months
Subtask 1: Obtain local IRB approvals or exempt status	1-3	1-3

Subtask 2: Obtain HRPO approval or exempt status	3-6	1-6
<i>Milestone(s) Achieved: Obtained local IRB and HRPO approvals</i>	1-6	
<b>Major Task 2: Obtain blood samples from three sites</b>		
Subtask 1: Send first batch of serum samples from sites 1, 4 and 5 to the University of Washington for analysis.	6-12	6-12
Subtask 2: Send second batch of serum samples from sites 1, 4, 5 to the University of Washington for analysis.	12-24	12-32
<i>Milestone(s) Achieved: All biological samples shipped to the University of Washington for analysis.</i>	6-24	6-32
<b>Major Task 3: Conduct BChE genotypic and phenotypic analyses</b>		
Subtask 1: Run BChE assays at University of Washington to determine genotype and phenotype for each serum sample from first shipment from sites 1,4 and 5	6-12	6-12
Subtask 2: Run BChE assays at University of Washington to determine genotype and phenotype for each serum sample from second shipment of sites 1, 4 and 5	12-24	12-48
<i>Milestone(s) Achieved: All serum samples will have genotypic and phenotypic data for BChE</i>	6-24	6-48
<b>Major Task 4: Perform BChE data analyses</b>		
Subtask 1: Acquire all newly analyzed BChE genotypic and phenotypic results data from University of Washington.	6-28	12-46
Subtask 2: Merge and clean all existing and newly acquired BChE data	24-26	24-46
Subtask 3: Merge clinical dataset data from sites 1,3,4,5 for case/control status, environmental exposures and demographics with results from laboratory analyses.	18-20	18-46
Subtask 4: Perform preliminary analysis	26-30	26-46
<i>Milestone(s) Achieved: Completed dataset with all BChE genotypic and phenotypic data and preliminary data analyzed.</i>	6-30	6-46
<b>Major Task 5: Collect all PON1 data from the four cohorts and merge with BChE and gene-exposure dataset.</b>		
Subtask 1: Collect data from Dr. Chao's PON1 study of the same four cohorts	20-26	20-46
Subtask 2: Merge PON1 dataset with BChE, environmental exposure and GWI case definition dataset	26-32	26-46

Subtask 3: Perform preliminary analyses	30-32	30-46
<i>Milestone(s) Achieved: Completed dataset with PON1 and BChE, data and preliminary data analyzed</i>	32	46
<b>Major Task 6: Data Analysis for gene-exposure analysis</b>		
Subtask 1: Perform gene-exposure (BChExPON1xexposure) data analyses	28-36	28-46
<i>Milestone(s) Achieved: Gene-exposure final data analysis completed</i>	12-36	12-46
<b>Major Task 7: Disseminate study results</b>		
Subtask 1: Present BChE, PON1 and gene-exposure analyses results at scientific conferences	12-32	12-48
Subtask 2: Prepare BChE and PON1 gene-exposure outcome manuscripts and submit for publication	28-36	28-48
<i>Milestone(s) Achieved: Prepare presentations and manuscripts</i>		
<b>Major Task 8: Write annual and final reports for DoD</b>		
Subtask 1: Write annual reports for DoD	12,24	12,24,36
Subtask 2: Write final report for DoD	36	48
<i>Milestone(s) Achieved: Annual and final reports will be submitted to DoD</i>	12,24,36	12,24,36,48

- What opportunities for training and professional development: This year I unfortunately have not had the opportunity for training or professional development. During this coming year I plan to work closely with Dr. Steele on the gene environment analysis as part of my professional development.

- Were the results disseminated to communities: Nothing to Report

- What do you plan to do during the next reporting period: Over the next reporting period I plan to 1) continue to conduct PON1 and BChE assays on the remaining samples, 2) acquire data from UW on BChE and BCHE, 3) continue to merge demographic and exposure data from the remaining participants to create our finalized dataset, 4) conduct preliminary analysis and 5) work on a paper as a group comparing the results from the toxic vs the non-toxic PON1 data for publication, PON1 papers, BChE papers and PON1xBChE interaction papers.

**4. IMPACT:** Nothing to Report yet

**5. CHANGES/PROBLEMS:** As the GWIC cohort and Dr. Kregel's cohort were still recruiting through this year we needed to push the timeline back so as to get the greatest number of participants as possible for this study. The merger of all of the data from each cohort ended up being more difficult and time consuming than anticipated and took the majority of this funding year to work through. However, we persisted and now have a fully merged dataset. The genotyping for BChE continued to be held up slightly as the lab in Washington was having some trouble with the devices they need to do the DNA extraction and that has

slowed the process down a bit. Thought it took longer than anticipated this year we finally received the VA approved DUA.

**6. PRODUCTS:** Nothing to Report

**7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**

- What individuals have worked on the project?

Name:	Patricia Janulewicz Lloyd, DSc, MPH
Project Role:	Principal Investigator
Nearest person month worked:	2.3
Contribution to Project	Dr. Janulewicz Lloyd has been the oversight of the entire project. She has worked with each of the co-Investigators to get biological samples shipped from their locations and has worked on the creation of the database for merged data.

Name:	Kimberly Sullivan, PhD
Project Role:	Co-Investigator
Nearest person month worked:	0.4
Contribution to Project	Dr. Sullivan was involved in getting biological samples shipped from the GWIC biorepository to the University of Washington

Name:	Christine Lloyd Travaglini
Project Role:	Data Analyst
Nearest person month worked:	0.69
Contribution to Project	Ms. Travaglini has worked on creating the structure of the dataset in which all of the demographic variables, exposure information and phenotypic and genotypic data will be merged from all cohorts

- Has there been a change in the active other support of the PD/PI or senior/key personnel since the last reporting: Nothing significant to Report
- What other organizations were involved as partners?

1. Organization Name: University of Washington

Location of Organization: Seattle, Washington

Partner's contribution to the project: Drs. Clement Furlong and Judit Marsillach and Ms Rebecca Richter

Facilities: All phenotypic and genetic analyses for this project are and will be conducted at the University of Washington using their equipment.

Collaboration: Drs. Furlong and Marsillach and Ms. Richter have been collaborating with the PI to obtain all necessary biological samples necessary for the completion of this study.

2. Organization Name: University of California San Francisco

Location of Organization: San Francisco, California

Partner's contribution to the project: Dr. Linda Chao

Collaboration: Dr. Chao has been collaborating with the PI and the collaborators at the University of Washington to locate all necessary biological samples necessary from the two cohorts of veterans that Dr. Chao has worked with and has biological samples from and will be used in this study.

3. Organization Name: Baylor College of Medicine

Location of Organization: Houston, Texas

Partner's contribution to the project: Dr. Lea Steele

Collaboration: Dr. Steele will be helping conduct the analyses for this study.

**8. SPECIAL REPORTING REQUIREMENTS:** Nothing to Report

**9. APPENDICES:** File named "Data Dictionary\_paj" is the data dictionary created for the merged dataset along with descriptive information for where the current dataset stands.

**GWIC\_SF\_MK\_Harmonized\_20201023 Data Dictionary**  
**Date of Creation: 23OCT20**

**Number of Observations: 546**

<b>Number</b>	<b>Variable</b>	<b>Label</b>	<b>Type</b>	<b>Format</b>	<b>Format Values</b>	<b>Descriptives</b>
1	subject_id	Subject ID	Char			N: 546 (100%) Levels: 546 Listing: 25 Characters of Five Non-Missing Levels  1001 1002 1004 1005 1009
2	Study	Study	Char	\$12.		N: 546 (100%) Levels: 4 Listing: 25 Characters of Five Non-Missing Levels  Chao_VAMerit GWIC Krengel SFVA_legacy
3	Site	Site	Num	SITE.	1=Boston 2=Miami 3=Texas 4=San Francisco	4: 210 (38.5%) Boston: 140 (25.6%) Miami: 50 (9.2%) Texas: 72 (13.2%) Missing: 74 (13.6%)
4	age	Age	Num	BEST12.		N: 542 NMiss: 4 Mean(SD): 52.7 (7.9) Median(IQR): 51.6 (48.1 - 57.0) Min - Max: 31.0 - 82.1
5	gender	Gender	Num	GENDERF.	1=Male 2=Female	Male: 456 (83.5%) Female: 85 (15.6%) Missing: 5 (0.9%)
6	hispanic	Hispanic or Latino	Num	HISPANIC_.	1=Yes 2=No	Yes: 51 (9.3%) No: 485 (88.8%) Missing: 10 (1.8%)

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7	race	Race (GWIC)	Num	RACENEW.	0=Black/African American 1=White/Caucasian 3=Asian/Pacific Islander 4=Aleutian Eskimo, or American Indian 5=Other/Multiracial	Black/African American: 33 (6%) White/Caucasian: 202 (37%) Asian/Pacific Islander: 1 (0.2%) Other/Multiracial: 19 (3.5%) Missing: 291 (53.3%)
8	ethnicity	Race/Ethnicity	Num	ETHNICITY.	0=Black/African American 1=White/Caucasian 2=Hispanic 3=Asian/Pacific Islander 4=Aleutian, Eskimo, or American Indian 5=Other/Multiracial 6=I would prefer not to answer 9=Respondent chose more than one, but not multiracial	Black/African American: 20 (3.7%) White/Caucasian: 211 (38.6%) Hispanic: 30 (5.5%) Asian/Pacific Islander: 12 (2.2%) Aleutian, Eskimo, or American Indian: 3 (0.5%) Other/Multiracial: 2 (0.4%) Respondent chose more than one, but not multiracial: 1 (0.2%) Missing: 267 (48.9%)
9	education1	Highest grade in school completed	Num	BEST12.		N: 528 NMiss: 18 Mean(SD): 14.9 (2.3) Median(IQR): 14.0 (13.0 - 16.0) Min - Max: 10.0 - 22.0
10	edu_new	Highest level of education	Num	EDUCNEW.	1=Grade 7-11 2=Grade 12/GED/HS plus other training 3=Associate Degree or 2-year college 4=Some college 5=Bachelor's Degree 6=Advanced or professional degree (M.A., M.S., M.B.A., Ph.D., M.D., etc)	Grade 12/GED/HS plus other training: 70 (12.8%) Associate Degree or 2-year college: 54 (9.9%) Some college: 118 (21.6%) Bachelor's Degree: 116 (21.2%) Advanced or professional degree (M.A., M.S., M.B.A., Ph.D., M.D., etc): 106 (19.4%) Missing: 82 (15%)

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11	edu_level	Highest level of education	Num	EDU_LEVEL.	1=Grade 7-11 2=Grade 12 3=GED 4=High School plus other training (technical or trade school) 5=Associate Degree or 2-year college 6=Some college 7=Bachelor's Degree 8=Advanced or professional degree (M.A., M.S., M.B.A., Ph.D., M.D., etc)	Grade 12: 14 (2.6%) GED: 9 (1.6%) High School plus other training (technical or trade school): 30 (5.5%) Associate Degree or 2-year college: 64 (11.7%) Some college: 51 (9.3%) Bachelor's Degree: 80 (14.7%) Advanced or professional degree (M.A., M.S., M.B.A., Ph.D., M.D., etc): 77 (14.1%) Missing: 221 (40.5%)
12	Education_level	Highest level of education (SF)	Char	\$30.		N: 208 (38.1%) NMiss: 338 (61.9%) Levels: 11 Listing: 25 Characters of Five Non-Missing Levels  4 yr college degree Colleg grad GED Grad/prof degree HS grad
13	marital_status	Marital Status	Num	MARSTATF.	1=Single, Never Married 2=Married or Live with Significant Other 3=Single, Divorced 4=Single, Separated 5=Single Widowed	Single, Never Married: 44 (8.1%) Married or Live with Significant Other: 366 (67%) Single, Divorced: 108 (19.8%) Single, Separated: 9 (1.6%) Single Widowed: 7 (1.3%) Missing: 12 (2.2%)

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14	occupation	Primary civilian occupation	Num	OCCUP.	1=Not Applicable (Active duty, AGR or Military Technician job) 2=Unemployed 3=Never worked 4=Student (full-time or part-time) 5=Agriculture worker (farm laborer, food picker) 6=Manual worker: non apprenticed (laborer, carpenter's helper, pesticide applicator) 7=Manual worker: apprenticed (electrician, mechanic, carpenter, machinist) 8=Clerical worker (typist, accounts clerk, postal clerk, data entry) 9=Service worker (janitor, domestic, cook, waiter) 10=Delivery service worker (truck driver, mail delivery person) 11=Sales worker or agent (salescheck, salesman, real estate, insurance, stockbroker) 12=Public safety officer (policeman, fireman, security guard) 13=Manager or proprietor (store owner or manager, department head or supervisor) 14=Technician (laboratory technician, draftsman, dental assistant) 15=Professional (engineer, teacher, lawyer, nurse, physician, executive)	16: 4 (0.7%) Not Applicable (Active duty, AGR or Military Technician job): 11 (2%) Unemployed: 52 (9.5%) Student (full-time or part-time): 3 (0.5%) Agriculture worker (farm laborer, food picker): 1 (0.2%) Manual worker: non apprenticed (laborer, carpenter's helper, pesticide applicator): 15 (2.7%) Manual worker: apprenticed (electrician, mechanic, carpenter, machinist): 22 (4%) Clerical worker (typist, accounts clerk, postal clerk, data entry): 15 (2.7%) Service worker (janitor, domestic, cook, waiter): 8 (1.5%) Delivery service worker (truck driver, mail delivery person): 7 (1.3%) Sales worker or agent (salescheck, salesman, real estate, insurance, stockbroker): 17 (3.1%) Public safety officer (policeman, fireman, security guard): 36 (6.6%) Manager or proprietor (store owner or manager, department head or supervisor): 34 (6.2%) Technician (laboratory technician, draftsman, dental assistant): 14 (2.6%) Professional (engineer, teacher, lawyer, nurse, physician, executive): 79 (14.5%) Missing: 228 (41.8%)

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15	work_category	Work Category (SF)	Char	\$50.		N: 210 (38.5%) NMiss: 336 (61.5%) Levels: 18 Listing: 25 Characters of Five Non-Missing Levels  employed full time employed part time full time full time/seeking employm full-time
16	current_in_military	Are you currently in the military? (SF)	Num	YESNO.	0=No 1=Yes	No: 198 (36.3%) Yes: 11 (2%) Missing: 337 (61.7%)
17	ps_fatigue	Fatigue	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 143 (26.2%) Yes, Mild: 95 (17.4%) Yes, Moderate: 186 (34.1%) Yes, Severe: 116 (21.2%) Missing: 6 (1.1%)
18	ps_unwell	Feeling unwell after physical exercise or exertion	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 249 (45.6%) Yes, Mild: 83 (15.2%) Yes, Moderate: 126 (23.1%) Yes, Severe: 80 (14.7%) Missing: 8 (1.5%)
19	ps_sleep	Problems getting to sleep or staying asleep	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 116 (21.2%) Yes, Mild: 95 (17.4%) Yes, Moderate: 153 (28%) Yes, Severe: 176 (32.2%) Missing: 6 (1.1%)
20	ps_rested	Not feeling rested after you sleep	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 121 (22.2%) Yes, Mild: 91 (16.7%) Yes, Moderate: 167 (30.6%) Yes, Severe: 162 (29.7%) Missing: 5 (0.9%)

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21	ps_joints <span>pain</span>	Pain in your joints	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 104 (19%) Yes, Mild: 102 (18.7%) Yes, Moderate: 198 (36.3%) Yes, Severe: 137 (25.1%) Missing: 5 (0.9%)
22	ps_joints <span>stiff</span>	Stiffness in your joints	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 126 (23.1%) Yes, Mild: 112 (20.5%) Yes, Moderate: 194 (35.5%) Yes, Severe: 109 (20%) Missing: 5 (0.9%)
23	ps_muscle <span>spain</span>	Pain in your muscles	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 216 (39.6%) Yes, Mild: 96 (17.6%) Yes, Moderate: 152 (27.8%) Yes, Severe: 74 (13.6%) Missing: 8 (1.5%)
24	ps_body_ <span>pain</span>	Body pain, where you hurt all over	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 282 (51.6%) Yes, Mild: 75 (13.7%) Yes, Moderate: 124 (22.7%) Yes, Severe: 60 (11%) Missing: 5 (0.9%)
25	ps_ <span>headaches</span>	Headaches	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 233 (42.7%) Yes, Mild: 115 (21.1%) Yes, Moderate: 115 (21.1%) Yes, Severe: 78 (14.3%) Missing: 5 (0.9%)
26	ps_ <span>feelingdizzy</span>	Feeling dizzy, lightheaded, or faint	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 274 (50.2%) Yes, Mild: 133 (24.4%) Yes, Moderate: 91 (16.7%) Yes, Severe: 43 (7.9%) Missing: 5 (0.9%)

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27	ps_eyessensitive	Eyes very sensitive to light	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 258 (47.3%) Yes, Mild: 101 (18.5%) Yes, Moderate: 122 (22.3%) Yes, Severe: 60 (11%) Missing: 5 (0.9%)
28	ps_blurredvision	Blurred or double vision	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 313 (57.3%) Yes, Mild: 116 (21.2%) Yes, Moderate: 93 (17%) Yes, Severe: 19 (3.5%) Missing: 5 (0.9%)
29	ps_numbness	Numbness or tingling in your extremities	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 214 (39.2%) Yes, Mild: 128 (23.4%) Yes, Moderate: 129 (23.6%) Yes, Severe: 69 (12.6%) Missing: 6 (1.1%)
30	ps_tremors	Tremors or shaking	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 367 (67.2%) Yes, Mild: 102 (18.7%) Yes, Moderate: 44 (8.1%) Yes, Severe: 28 (5.1%) Missing: 5 (0.9%)
31	ps_lowtoler	Low tolerance for heat or cold	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 300 (54.9%) Yes, Mild: 78 (14.3%) Yes, Moderate: 105 (19.2%) Yes, Severe: 55 (10.1%) Missing: 8 (1.5%)
32	ps_nightsweats	Night sweats	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 285 (52.2%) Yes, Mild: 100 (18.3%) Yes, Moderate: 105 (19.2%) Yes, Severe: 48 (8.8%) Missing: 8 (1.5%)

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33	ps_physical	Having physical or mental symptoms after breathing in certain chemicals or smells	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 319 (58.4%) Yes, Mild: 84 (15.4%) Yes, Moderate: 63 (11.5%) Yes, Severe: 73 (13.4%) Missing: 7 (1.3%)
34	ps_skinrashes	Skin rashes	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 329 (60.3%) Yes, Mild: 109 (20%) Yes, Moderate: 65 (11.9%) Yes, Severe: 37 (6.8%) Missing: 6 (1.1%)
35	ps_skinprob	Other skin problems	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 382 (70%) Yes, Mild: 74 (13.6%) Yes, Moderate: 53 (9.7%) Yes, Severe: 30 (5.5%) Missing: 7 (1.3%)
36	ps_diarrhea	Diarrhea	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 311 (57%) Yes, Mild: 92 (16.8%) Yes, Moderate: 76 (13.9%) Yes, Severe: 60 (11%) Missing: 7 (1.3%)
37	ps_nausea	Nausea or upset stomach	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 301 (55.1%) Yes, Mild: 106 (19.4%) Yes, Moderate: 90 (16.5%) Yes, Severe: 44 (8.1%) Missing: 5 (0.9%)
38	ps_paincramp	Abdominal pain or cramping	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 324 (59.3%) Yes, Mild: 91 (16.7%) Yes, Moderate: 80 (14.7%) Yes, Severe: 46 (8.4%) Missing: 5 (0.9%)

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39	ps_breathing	Difficulty breathing or catching your breath	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 306 (56%) Yes, Mild: 97 (17.8%) Yes, Moderate: 103 (18.9%) Yes, Severe: 33 (6%) Missing: 7 (1.3%)
40	ps_coughing	Frequent coughing when you don't have a cold	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 318 (58.2%) Yes, Mild: 90 (16.5%) Yes, Moderate: 92 (16.8%) Yes, Severe: 37 (6.8%) Missing: 9 (1.6%)
41	ps_wheezing	Wheezing in your chest	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 387 (70.9%) Yes, Mild: 75 (13.7%) Yes, Moderate: 54 (9.9%) Yes, Severe: 21 (3.8%) Missing: 9 (1.6%)
42	ps_concentrating	Difficulty concentrating	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 153 (28%) Yes, Mild: 128 (23.4%) Yes, Moderate: 146 (26.7%) Yes, Severe: 112 (20.5%) Missing: 7 (1.3%)
43	ps_remembering	Difficulty remembering recent information	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 138 (25.3%) Yes, Mild: 131 (24%) Yes, Moderate: 144 (26.4%) Yes, Severe: 128 (23.4%) Missing: 5 (0.9%)
44	ps_speaking	Trouble finding words when speaking	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 193 (35.3%) Yes, Mild: 136 (24.9%) Yes, Moderate: 138 (25.3%) Yes, Severe: 74 (13.6%) Missing: 5 (0.9%)

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45	ps_depressed	Feeling down or depressed	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 217 (39.7%) Yes, Mild: 137 (25.1%) Yes, Moderate: 106 (19.4%) Yes, Severe: 79 (14.5%) Missing: 7 (1.3%)
46	ps_irritable	Feeling irritable or having angry outbursts	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 208 (38.1%) Yes, Mild: 132 (24.2%) Yes, Moderate: 124 (22.7%) Yes, Severe: 74 (13.6%) Missing: 8 (1.5%)
47	ps_moody	Feeling moody	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 205 (37.5%) Yes, Mild: 145 (26.6%) Yes, Moderate: 119 (21.8%) Yes, Severe: 69 (12.6%) Missing: 8 (1.5%)
48	ps_anxious	Feeling anxious	Num	PS_CRIT.	0=No 1=Yes, Mild 2=Yes, Moderate 3=Yes, Severe	No: 188 (34.4%) Yes, Mild: 130 (23.8%) Yes, Moderate: 122 (22.3%) Yes, Severe: 96 (17.6%) Missing: 10 (1.8%)
49	ps_diabetes	35. Diabetes	Num	PS_DIABETES -	0=No 1=Yes 98=Refused	No: 417 (76.4%) Yes: 52 (9.5%) Missing: 77 (14.1%)
50	ps_diabetes_5y	35a. Has your blood sugar been well-controlled for the past 5 years?	Num	PS_HEARTDIS EASE_.	0=No 1=Yes 98=Refused	Yes: 25 (4.6%) Missing: 521 (95.4%)
51	ps_heartdisease	36. Heart disease (other than high blood pressure)	Num	PS_HEARTDIS EASE_.	0=No 1=Yes 98=Refused	No: 444 (81.3%) Yes: 27 (4.9%) Missing: 75 (13.7%)

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52	ps_heartdisease_sp	36a. Specific Type: Heart Disease	Char	\$5000.		N: 262 (48%) NMiss: 284 (52%) Levels: 10 Listing: 25 Characters of Five Non-Missing Levels  .N Angiogram with minor bloc Cardiomyopathy. Last yea MI in 2012. Mild MI 1994
53	ps_heartdisease_5y	36b. Have you had this condition in the past 5 years?	Num	PS_HEARTDIS EASE_5Y_.	0=No 1=Yes 98=Refused	N: 253 (46.3%) No: 9 (1.6%) Missing: 284 (52%)
54	ps_stroke	37. Stroke	Num	PS_STROKE_.	0=No 1=Yes 98=Refused	No: 466 (85.3%) Yes: 5 (0.9%) Missing: 75 (13.7%)
55	ps_lupus	38. Lupus	Num	PS_LUPUS_.	0=No 1=Yes 98=Refused	No: 469 (85.9%) Yes: 1 (0.2%) Missing: 76 (13.9%)
56	ps_multisclerosi s	39. Multiple sclerosis	Num	PS_MULTISCL EROSIS_.	0=No 1=Yes 98=Refused	No: 469 (85.9%) Missing: 77 (14.1%)
57	ps_arthritis	40. Arthritis	Num	PS_ ARTHRITIS _.	0=No 1=Yes 98=Refused	No: 345 (63.2%) Yes: 112 (20.5%) Missing: 89 (16.3%)
58	ps_arthritis_type	40a. Type of Arthritis	Num	PS_ ARTHRITIS _TYPE_.	0=Osteoarthritis 1=Rheumatoid 98=Refused	N: 170 (31.1%) Osteoarthritis: 90 (16.5%) Missing: 286 (52.4%)
59	ps_parkinson	41. Parkinson's Disease	Num	PS_PARKINSO N_.	0=No 1=Yes 98=Refused	No: 470 (86.1%) Missing: 76 (13.9%)

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60	ps_als	42. ALS, or Lou Gehrig's Disease	Num	PS_ALS_.	0=No 1=Yes 98=Refused	No: 470 (86.1%) Missing: 76 (13.9%)
61	ps_seizure	43. A seizure disorder	Num	PS_SEIZURE_.	0=No 1=Yes 98=Refused	No: 465 (85.2%) Yes: 4 (0.7%) Missing: 77 (14.1%)
62	ps_seizure_5y	43a. Have you been treated for this disorder or had any seizures in the past 5 years?	Num	PS_SEIZURE_5Y_.	0=No 1=Yes 98=Refused	N: 261 (47.8%) No: 1 (0.2%) Missing: 284 (52%)
63	ps_alzheimer	44. Alzheimer's Disease	Num	PS_ALZHEIME R_.	0=No 1=Yes 98=Refused	No: 468 (85.7%) Yes: 2 (0.4%) Missing: 76 (13.9%)
64	ps_cancer	45. Cancer (other than skin cancer)	Num	PS_CANCER_.	0=No 1=Yes 98=Refused	No: 451 (82.6%) Yes: 19 (3.5%) Missing: 76 (13.9%)
65	ps_cancer_5y	45a. Have you had this condition in the past 5 years?	Num	PS_CANCER_5Y_.	0=No 1=Yes 98=Refused	No: 7 (1.3%) Missing: 539 (98.7%)
66	ps_melanoma	46. Melanoma	Num	PS_MELANOM A_.	0=No 1=Yes 98=Refused	No: 459 (84.1%) Yes: 11 (2%) Missing: 76 (13.9%)
67	ps_melanoma_5y	46a. Have you had this condition in the past 5 years?	Num	PS_MELANOM A_5Y_.	0=No 1=Yes 98=Refused	N: 261 (47.8%) No: 1 (0.2%) Missing: 284 (52%)
68	ps_liverdisease	47. Liver disease	Num	PS_LIVERDISE ASE_.	0=No 1=Yes 98=Refused	No: 458 (83.9%) Yes: 13 (2.4%) Missing: 75 (13.7%)
69	ps_liverdisease_5y	47a. Have you had this condition in the past 5 years?	Num	PS_LIVERDISE ASE_5Y_.	0=No 1=Yes 98=Refused	N: 259 (47.4%) No: 1 (0.2%) Yes: 2 (0.4%) Missing: 284 (52%)

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70	ps_kidneydisease	48. Kidney disease	Num	PS_KIDNEYDISEASE_.	0=No 1=Yes 98=Refused	No: 460 (84.2%) Yes: 11 (2%) Missing: 75 (13.7%)
71	ps_kidneydisease_5y	48a. Have you had this condition in the past 5 years?	Num	PS_KIDNEYDISEASE_5Y_.	0=No 1=Yes 98=Refused	N: 262 (48%) Missing: 284 (52%)
72	ps_schizophrenia	49. Schizophrenia	Num	PS_SCHIZOPHRENIA_.	0=No 1=Yes 98=Refused	No: 470 (86.1%) Yes: 1 (0.2%) Missing: 75 (13.7%)
73	ps_bipolar	50. Bipolar disorder	Num	PS_BIPOLAR_.	0=No 1=Yes 98=Refused	No: 468 (85.7%) Yes: 3 (0.5%) Missing: 75 (13.7%)
74	ps_stressdis	51. Have you been hospitalized for PTSD or Post Traumatic Stress Disorder in the past 5 years?	Num	PS_STRESSDIS_.	0=No 1=Yes 98=Refused	No: 466 (85.3%) Yes: 5 (0.9%) Missing: 75 (13.7%)
75	ps_depression	52. Have you been hospitalized for depression in the last 5 years?	Num	PS_DEPRESSION_.	0=No 1=Yes 98=Refused	No: 465 (85.2%) Yes: 6 (1.1%) Missing: 75 (13.7%)
76	ps_alcoholdrug	53. Have you been hospitalized for alcohol or drug dependence in the last 5 years?	Num	PS_ALCOHOLDRUG_.	0=No 1=Yes 98=Refused	No: 467 (85.5%) Yes: 4 (0.7%) Missing: 75 (13.7%)
77	ps_chronicinfec	54. Do you currently have a chronic infectious disease lasting 6 months or longer?	Num	PS_CHRONICINFEC_.	0=No 1=Yes 98=Refused	No: 461 (84.4%) Yes: 8 (1.5%) Missing: 77 (14.1%)
78	ps_otherconditions	55. Do you currently have any other diagnosed conditions that have lasted 6 months or longer?	Num	PS_OTHERCONDITIONS_.	0=No 1=Yes 98=Refused	No: 115 (21.1%) Yes: 147 (26.9%) Missing: 284 (52%)

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79	ps_otherconditions_sp	55a. Specific Type(s): Other Diagnosed Conditions	Char	\$5000.		N: 468 (85.7%) NMiss: 78 (14.3%) Levels: 227 Listing: 25 Characters of Five Non-Missing Levels  "missing proteins in my b .N 0 1 ADHD, mood disorder, OCD
80	ps_fatigue_domain	Kansas Case Definition: Fatigue Domain (Range 0 - 12)	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 6.0 (3.8) Median(IQR): 6.0 (3.0 - 9.0) Min - Max: 0.0 - 12.0
81	ps_pain_domain	Kansas Case Definition: Pain Domain (Range 0 - 9)	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 3.8 (2.8) Median(IQR): 3.0 (1.0 - 6.0) Min - Max: 0.0 - 9.0
82	ps_neuro_domain	Kansas Case Definition: Neuro Domain (Range 0 - 42)	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 13.8 (10.2) Median(IQR): 12.0 (6.0 - 21.0) Min - Max: 0.0 - 42.0
83	ps_skin_domain	Kansas Case Definition: Skin Domain (Range 0 - 6)	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 1.1 (1.6) Median(IQR): 0.0 (0.0 - 2.0) Min - Max: 0.0 - 6.0

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84	ps_gastro_domain	Kansas Case Definition: Gastro Domain (Range 0 - 9)	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 2.3 (2.7) Median(IQR): 1.0 (0.0 - 4.0) Min - Max: 0.0 - 9.0
85	ps_respir_domain	Kansas Case Definition: Respir Domain (Range 0 - 9)	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 1.9 (2.3) Median(IQR): 1.0 (0.0 - 3.0) Min - Max: 0.0 - 9.0
86	ps_domains_ge2	Kansas Case Definition: Number of Domains with Score 2 or Greater	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 3.7 (1.8) Median(IQR): 4.0 (2.0 - 5.0) Min - Max: 0.0 - 6.0
87	kansas_score	Total Health Symptoms Reported (Kansas Symptom List Range: 0-32)	Num	BEST12.		N: 325 NMiss: 221 Mean(SD): 19.2 (9.2) Median(IQR): 21.0 (12.0 - 27.0) Min - Max: 0.0 - 32.0
88	kansas_denom	Kansas Criteria Number of Responses	Num			N: 262 NMiss: 284 Mean(SD): 31.3 (4.8) Median(IQR): 32.0 (32.0 - 32.0) Min - Max: 0.0 - 32.0
89	Ks_Exc	Has Kansas GWI exclusionary condition	Num	YESNO.	0=No 1=Yes	No: 142 (26%) Yes: 68 (12.5%) Missing: 336 (61.5%)
90	case_control	Kansas Case or Control Status	Num	CC.	0=Control 1=Case	Control: 100 (18.3%) Case: 304 (55.7%) Missing: 142 (26%)
91	KansasModified	Kansas Case or Control Status (no exclusionary criteria applied)	Num	CC.	0=Control 1=Case	Control: 27 (4.9%) Case: 42 (7.7%) Missing: 477 (87.4%)

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92	cdc_fatigue	CDC Case Definition: Fatigue Domain (Yes/No)	Num	YESNO.	0=No 1=Yes	No: 143 (26.2%) Yes: 397 (72.7%) Missing: 6 (1.1%)
93	cdc_pain	CDC Case Definition: Pain Domain (Yes/No)	Num	YESNO.	0=No 1=Yes	No: 86 (15.8%) Yes: 455 (83.3%) Missing: 5 (0.9%)
94	cdc_neuro	CDC Case Definition: Neuro Domain (Yes/No)	Num	YESNO.	0=No 1=Yes	No: 53 (9.7%) Yes: 488 (89.4%) Missing: 5 (0.9%)
95	cdc_domains	CDC Case Definition: Number of Domains with Score 1 or Greater	Num	BEST12.		N: 541 NMiss: 5 Mean(SD): 2.5 (0.9) Median(IQR): 3.0 (2.0 - 3.0) Min - Max: 0.0 - 3.0
96	cdc_case_control	CDC Case or Control Status	Num	CC.	0=Control 1=Case	Control: 84 (15.4%) Case: 457 (83.7%) Missing: 5 (0.9%)
97	hbp	High blood pressure or hypertension	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 248 (45.4%) Yes: 199 (36.4%) Missing: 99 (18.1%)
98	mi	Myocardial infarction or heart attack	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 430 (78.8%) Yes: 13 (2.4%) Missing: 103 (18.9%)
99	asthm	Asthma	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 278 (50.9%) Yes: 40 (7.3%) Missing: 228 (41.8%)
100	arryth	Any other heart trouble or arrhythmias	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 223 (40.8%) Yes: 33 (6%) Missing: 290 (53.1%)
101	diab	High sugar or diabetes	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 389 (71.2%) Yes: 56 (10.3%) Missing: 101 (18.5%)

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102	tia	Stroke/cerebrovascular disease/TIA	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 439 (80.4%) Yes: 8 (1.5%) Missing: 99 (18.1%)
103	epil	Epilepsy	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 312 (57.1%) Yes: 3 (0.5%) Missing: 231 (42.3%)
104	als	Amyotrophic Lateral Sclerosis (ALS)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 504 (92.3%) Yes: 1 (0.2%) Missing: 41 (7.5%)
105	ms	Multiple Sclerosis (MS)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 503 (92.1%) Yes: 1 (0.2%) Missing: 42 (7.7%)
106	pd	Parkinsons Disease (PD)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 423 (77.5%) Missing: 123 (22.5%)
107	ad	Alzheimers Disease	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 423 (77.5%) Yes: 1 (0.2%) Missing: 122 (22.3%)
108	cere	Cerebellar Disorder	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 294 (53.8%) Yes: 3 (0.5%) Missing: 249 (45.6%)
109	othneur	Other neurological disorders	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 252 (46.2%) Yes: 48 (8.8%) Missing: 246 (45.1%)
110	ca	Cancer of any kind	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 288 (52.7%) Yes: 28 (5.1%) Missing: 230 (42.1%)
111	respir	Respiratory allergies or sinus problems	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 186 (34.1%) Yes: 136 (24.9%) Missing: 224 (41%)

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112	arthr	Arthritis, rheumatism, or gout	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 281 (51.5%) Yes: 166 (30.4%) Missing: 99 (18.1%)
113	neck	Repeated trouble with neck, back or spine	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 143 (26.2%) Yes: 178 (32.6%) Missing: 225 (41.2%)
114	blind	Blindness or significant trouble seeing with one or both eyes	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 273 (50%) Yes: 45 (8.2%) Missing: 228 (41.8%)
115	lung	Chronic lung disease such as chronic bronchitis	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 403 (73.8%) Yes: 42 (7.7%) Missing: 101 (18.5%)
116	chrrash	Chronic rash or skin condition such as eczema, psoriasis, cholracne, or dermatitis	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 219 (40.1%) Yes: 103 (18.9%) Missing: 224 (41%)
117	memory	Memory loss or concentration problems	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 110 (20.1%) Yes: 194 (35.5%) Missing: 242 (44.3%)
118	deaf	Deafness in one or both ears, or any other serious trouble with hearing	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 223 (40.8%) Yes: 95 (17.4%) Missing: 228 (41.8%)
119	stiff	Permanent stiffness or any deformity of any of your limbs (permanent stiffness means joints will not move at all)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 299 (54.8%) Yes: 18 (3.3%) Missing: 229 (41.9%)
120	depres	Depression	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 236 (43.2%) Yes: 191 (35%) Missing: 119 (21.8%)
121	ptsd	Post-Traumatic Stress Disorder (PTSD)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 141 (25.8%) Yes: 162 (29.7%) Missing: 243 (44.5%)

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122	othpsy	Other psychological disorders	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 217 (39.7%) Yes: 39 (7.1%) Missing: 290 (53.1%)
123	chemsen	Chemical Sensitivity/Multiple Chemical Sensitivity	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 252 (46.2%) Yes: 64 (11.7%) Missing: 230 (42.1%)
124	fatig	Chronic Fatigue Syndrome (CFS)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 177 (32.4%) Yes: 141 (25.8%) Missing: 228 (41.8%)
125	bowel	Irritable Bowel Syndrome (IBS)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 192 (35.2%) Yes: 127 (23.3%) Missing: 227 (41.6%)
126	othgi	Other gastrointestinal disorder	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 172 (31.5%) Yes: 83 (15.2%) Missing: 291 (53.3%)
127	HICHOL	High cholesterol	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 97 (17.8%) Yes: 78 (14.3%) Missing: 371 (67.9%)
128	arthritis	Arthritis	Char	\$44.		N: 81 (14.8%) NMiss: 465 (85.2%) Levels: 10 Listing: 25 Characters of Five Non-Missing Levels  0 1 1 (Osteo/rheu not specifi 1 (RA) 1 (degenerative disk dise
129	Emph_asthma_COPD	Emphysema, asthma or COPD	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 116 (21.2%) Yes: 12 (2.2%) Missing: 418 (76.6%)

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130	Angina	Angina (chest pain due to heart problems)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 122 (22.3%) Yes: 5 (0.9%) Missing: 419 (76.7%)
131	congest_heart_failure	Congestive heart failure	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 126 (23.1%) Yes: 1 (0.2%) Missing: 419 (76.7%)
132	other_heart_disease	Other heart disease	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 118 (21.6%) Yes: 9 (1.6%) Missing: 419 (76.7%)
133	blood_clot_in_lungs	Blood clot in lungs	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 126 (23.1%) Yes: 1 (0.2%) Missing: 419 (76.7%)
134	blood_clot_in_legs	Blood clot in legs	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 122 (22.3%) Yes: 5 (0.9%) Missing: 419 (76.7%)
135	thyroid_disease	Thyroid disease	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 109 (20%) Yes: 10 (1.8%) Missing: 427 (78.2%)
136	seizure	Seizures or convulsions	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 127 (23.3%) Missing: 419 (76.7%)
137	glaucoma	Glaucoma	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 124 (22.7%) Yes: 3 (0.5%) Missing: 419 (76.7%)
138	cataracts	Cataracts	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 114 (20.9%) Yes: 13 (2.4%) Missing: 419 (76.7%)
139	other_neuro	Other neurological disease	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 124 (22.7%) Yes: 3 (0.5%) Missing: 419 (76.7%)

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140	kidney	Kidney or renal disease	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 121 (22.2%) Yes: 6 (1.1%) Missing: 419 (76.7%)
141	liver_hep_cirrhosis	Liver disease, hepatitis, or cirrhosis	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 121 (22.2%) Yes: 6 (1.1%) Missing: 419 (76.7%)
142	ulcer	Ulcer (stomach, peptic)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 122 (22.3%) Yes: 5 (0.9%) Missing: 419 (76.7%)
143	GI_bleed	Intestinal (GI) bleeding	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 122 (22.3%) Yes: 5 (0.9%) Missing: 419 (76.7%)
144	GERD	Gastroesophageal Reflux Disease (GERD)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 102 (18.7%) Yes: 25 (4.6%) Missing: 419 (76.7%)
145	pancreatitis	Pancreatitis	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 123 (22.5%) Yes: 4 (0.7%) Missing: 419 (76.7%)
146	osteoporosis	Osteoporosis (thinning of bones)	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 110 (20.1%) Yes: 17 (3.1%) Missing: 419 (76.7%)
147	back_problems	Back problems	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 75 (13.7%) Yes: 52 (9.5%) Missing: 419 (76.7%)
148	perpheral_vascular	Peripheral vascular disease	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 126 (23.1%) Yes: 1 (0.2%) Missing: 419 (76.7%)
149	AIDS_HIV	AIDS or HIV infection	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 123 (22.5%) Missing: 423 (77.5%)

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150	ANX	Anxiety	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 119 (21.8%) Yes: 51 (9.3%) Missing: 376 (68.9%)
151	BIPOLAR	Bipolar Disorder/Manic Depression	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 508 (93%) Yes: 5 (0.9%) Missing: 33 (6%)
152	SCHIZ	Schizophrenia	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 511 (93.6%) Yes: 1 (0.2%) Missing: 34 (6.2%)
153	LUPUS	Lupus	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 510 (93.4%) Yes: 1 (0.2%) Missing: 35 (6.4%)
154	CAPS_PTSD	PTSD Dx according to Clinician Administered PTSD Scale (CAPS)	Num	YESNO.	0=No 1=Yes	No: 175 (32.1%) Yes: 35 (6.4%) Missing: 336 (61.5%)
155	SCID_MDD	Current Major Depressive Disorder (MDD) according to SCID	Num	YESNO.	0=No 1=Yes	No: 185 (33.9%) Yes: 25 (4.6%) Missing: 336 (61.5%)
156	SCID_anxiety	Current anxiety according to SCID	Num	YESNO.	0=No 1=Yes	No: 81 (14.8%) Yes: 2 (0.4%) Missing: 463 (84.8%)
157	tbi_prewar	How many mild traumatic brain injuries (i.e. concussions) did you have before the Gulf War (including from sports)?	Num	BEST12.		N: 320 NMiss: 226 Mean(SD): 0.8 (1.4) Median(IQR): 0.0 (0.0 - 1.0) Min - Max: 0.0 - 15.0
158	tbi_duringwar	How many mild traumatic brain injuries (i.e. concussions) did you have during the Gulf War (including from sports)?	Num	BEST12.		N: 323 NMiss: 223 Mean(SD): 0.7 (1.4) Median(IQR): 0.0 (0.0 - 1.0) Min - Max: 0.0 - 12.0

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159	tbi_postwar	How many mild traumatic brain injuries (i.e. concussions) did you have after the Gulf War (including from sports)?	Num	BEST12.		N: 324 NMiss: 222 Mean(SD): 1.4 (11.2) Median(IQR): 0.0 (0.0 - 1.0) Min - Max: 0.0 - 200.0
160	anytbi_prewar	Any TBI Prior to Gulf War (including from sports)	Num	YESNO.	0=No 1=Yes	No: 200 (36.6%) Yes: 120 (22%) Missing: 226 (41.4%)
161	anytbi_duringwar	Any TBI During Gulf War (including from sports)	Num	YESNO.	0=No 1=Yes	No: 228 (41.8%) Yes: 95 (17.4%) Missing: 223 (40.8%)
162	anytbi_postwar	Any TBI After Gulf War (including from sports)	Num	YESNO.	0=No 1=Yes	No: 222 (40.7%) Yes: 102 (18.7%) Missing: 222 (40.7%)
163	TBI_lifetime	Traumatic brain injury (Before/During/After War)	Num	YESNO.	0=No 1=Yes	No: 146 (26.7%) Yes: 178 (32.6%) Missing: 222 (40.7%)
164	OSUTBI	TBI according to the Ohio State University TBI Identification method/interview	Num	OSUTBI.	1=improbable 2=possible 3=mild 4=moderate	improbable: 66 (12.1%) possible: 32 (5.9%) mild: 27 (4.9%) moderate: 2 (0.4%) Missing: 419 (76.7%)
165	exp_deploy	Did you deploy to the Persian Gulf region any time between August 1990 and July 1991?	Num	EXP_DEPLOY_.	0=No 1=Yes	No: 10 (1.8%) Yes: 455 (83.3%) Missing: 81 (14.8%)

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166	exp_arrive	In what month and year did you first arrive in the region?	Char	\$500.		N: 461 (84.4%) NMiss: 85 (15.6%) Levels: 37 Listing: 25 Characters of Five Non-Missing Levels  01/1990 01/1991 01/1992 02/1991 03/1990
167	exp_leave	In what month and year did you last leave the region?	Char	\$500.		N: 461 (84.4%) NMiss: 85 (15.6%) Levels: 48 Listing: 25 Characters of Five Non-Missing Levels  01/1991 01/1992 02/1991 02/1992 03/1991
168	occupation_in_gulf	Occupation in Gulf	Char	\$84.		N: 202 (37%) NMiss: 344 (63%) Levels: 171 Listing: 25 Characters of Five Non-Missing Levels  11BIP 13 Bravo Field Artillery 16S 2110-2111-2102 Ordance Tr 3061 subs. clerk

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169	exp_smoke	Saw smoke from oil well fires	Num	EXP_SMOKE_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 72 (13.2%) Yes, 1 - 6 days: 98 (17.9%) Yes, 7 - 30 days: 128 (23.4%) Yes, 31 days or more: 162 (29.7%) Missing: 86 (15.8%)
170	exp_chemical	Heard chemical alarms sounded	Num	EXP_CHEMIC AL_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 99 (18.1%) Yes, 1 - 6 days: 173 (31.7%) Yes, 7 - 30 days: 121 (22.2%) Yes, 31 days or more: 69 (12.6%) Missing: 84 (15.4%)
171	exp_missile	Had SCUD missile explode within one mile of you	Num	EXP_MISSILE_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 245 (44.9%) Yes, 1 - 6 days: 146 (26.7%) Yes, 7 - 30 days: 38 (7%) Yes, 31 days or more: 31 (5.7%) Missing: 86 (15.8%)
172	exp_ground	Was directly involved in ground combat	Num	EXP_GROUND_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 278 (50.9%) Yes, 1 - 6 days: 105 (19.2%) Yes, 7 - 30 days: 41 (7.5%) Yes, 31 days or more: 39 (7.1%) Missing: 83 (15.2%)
173	exp_air	Was directly involved in air combat	Num	EXP_AIR_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 420 (76.9%) Yes, 1 - 6 days: 19 (3.5%) Yes, 7 - 30 days: 8 (1.5%) Yes, 31 days or more: 17 (3.1%) Missing: 82 (15%)
174	exp_wounded	Saw American or Allied troops who had been badly wounded or killed	Num	EXP_WOUNDE D_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 232 (42.5%) Yes, 1 - 6 days: 135 (24.7%) Yes, 7 - 30 days: 61 (11.2%) Yes, 31 days or more: 36 (6.6%) Missing: 82 (15%)

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175	exp_killed	Saw Iraqis or civilians who had been badly wounded or killed	Num	EXP_KILLED_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 169 (31%) Yes, 1 - 6 days: 156 (28.6%) Yes, 7 - 30 days: 98 (17.9%) Yes, 31 days or more: 41 (7.5%) Missing: 82 (15%)
176	exp_prisoners	Came into contact with prisoners of war	Num	EXP_PRISONERS_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 225 (41.2%) Yes, 1 - 6 days: 110 (20.1%) Yes, 7 - 30 days: 78 (14.3%) Yes, 31 days or more: 51 (9.3%) Missing: 82 (15%)
177	exp_deadanimals	Saw dead animals	Num	EXP_DEADANIMALS_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 78 (14.3%) Yes, 1 - 6 days: 98 (17.9%) Yes, 7 - 30 days: 42 (7.7%) Yes, 31 days or more: 37 (6.8%) Missing: 291 (53.3%)
178	exp_contdeadanimals	Came into direct contact with dead animals	Num	EXP_CONTDEADANIMALS_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 282 (51.6%) Yes, 1 - 6 days: 103 (18.9%) Yes, 7 - 30 days: 54 (9.9%) Yes, 31 days or more: 26 (4.8%) Missing: 81 (14.8%)
179	exp_enemyvehicles	Saw destroyed enemy vehicles	Num	EXP_ENEMYVEHICLES_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 45 (8.2%) Yes, 1 - 6 days: 75 (13.7%) Yes, 7 - 30 days: 72 (13.2%) Yes, 31 days or more: 63 (11.5%) Missing: 291 (53.3%)
180	exp_destroenemyveh	Came into direct contact with destroyed enemy vehicles	Num	EXP_DESTROYENEMYVEH_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 165 (30.2%) Yes, 1 - 6 days: 135 (24.7%) Yes, 7 - 30 days: 96 (17.6%) Yes, 31 days or more: 67 (12.3%) Missing: 83 (15.2%)

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181	exp_americanveh	Came into direct contact with American vehicles hit by friendly fire	Num	EXP_AMERICANVEH_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 324 (59.3%) Yes, 1 - 6 days: 78 (14.3%) Yes, 7 - 30 days: 31 (5.7%) Yes, 31 days or more: 29 (5.3%) Missing: 84 (15.4%)
182	exp_cream	Used pesticide cream or spray on your skin	Num	EXP_CREAM_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 170 (31.1%) Yes, 1 - 6 days: 41 (7.5%) Yes, 7 - 30 days: 67 (12.3%) Yes, 31 days or more: 178 (32.6%) Missing: 90 (16.5%)
183	powdered_pesticides	Used pesticide powder on your skin	Num	EXP_PESTICIDES_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 172 (31.5%) Yes, 1 - 6 days: 5 (0.9%) Yes, 7 - 30 days: 8 (1.5%) Yes, 31 days or more: 18 (3.3%) Missing: 343 (62.8%)
184	exp_pesticides	Wore a uniform treated with pesticides	Num	EXP_PESTICIDES_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 277 (50.7%) Yes, 1 - 6 days: 27 (4.9%) Yes, 7 - 30 days: 42 (7.7%) Yes, 31 days or more: 113 (20.7%) Missing: 87 (15.9%)
185	exp_fleacollar	Wore a flea collar	Num	EXP_FLEACOLLAR_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 419 (76.7%) Yes, 1 - 6 days: 15 (2.7%) Yes, 7 - 30 days: 15 (2.7%) Yes, 31 days or more: 14 (2.6%) Missing: 83 (15.2%)
186	exp_fogged	Saw the area in which you lived fogged or sprayed with pesticides	Num	EXP_FOGGED_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 298 (54.6%) Yes, 1 - 6 days: 64 (11.7%) Yes, 7 - 30 days: 42 (7.7%) Yes, 31 days or more: 50 (9.2%) Missing: 92 (16.8%)

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187	exp_armshots	Received one or more shots in the arm while in theater	Num	EXP_ARMSHOTS_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 128 (23.4%) Yes, 1 - 6 days: 281 (51.5%) Yes, 7 - 30 days: 27 (4.9%) Yes, 31 days or more: 20 (3.7%) Missing: 90 (16.5%)
188	exp_buttockshots	Received one or more shots in the buttocks while in theater	Num	EXP_BUTTOCKSSHOTS_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 234 (42.9%) Yes, 1 - 6 days: 196 (35.9%) Yes, 7 - 30 days: 9 (1.6%) Yes, 31 days or more: 16 (2.9%) Missing: 91 (16.7%)
189	exp_napp	Took pyridostigmine pills (NAPP pills)	Num	EXP_NAPP_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 114 (20.9%) Yes, 1 - 6 days: 137 (25.1%) Yes, 7 - 30 days: 99 (18.1%) Yes, 31 days or more: 109 (20%) Missing: 87 (15.9%)
190	exp_carc	Used or came into contact with freshly applied CARC paint	Num	EXP_CARC_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 302 (55.3%) Yes, 1 - 6 days: 62 (11.4%) Yes, 7 - 30 days: 35 (6.4%) Yes, 31 days or more: 56 (10.3%) Missing: 91 (16.7%)
191	fuel_burning_tent_heater	fuel-burning tent heater	Num	EXP_24HOURSLEEP_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 95 (17.4%) Yes, 1 - 6 days: 15 (2.7%) Yes, 7 - 30 days: 18 (3.3%) Yes, 31 days or more: 78 (14.3%) Missing: 340 (62.3%)
192	exp_24hoursleep	Had less than four hours of sleep in a 24-hour period	Num	EXP_24HOURSLEEP_.	0=No 1=Yes, 1 - 6 days 2=Yes, 7 - 30 days 3=Yes, 31 days or more	No: 37 (6.8%) Yes, 1 - 6 days: 122 (22.3%) Yes, 7 - 30 days: 161 (29.5%) Yes, 31 days or more: 143 (26.2%) Missing: 83 (15.2%)

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193	exp_branch	In August 1990, what was your branch of service?	Num	EXP_BRANCH _.	1=Army 2=Navy 3=Air Force 4=Marines	Army: 277 (50.7%) Navy: 74 (13.6%) Air Force: 44 (8.1%) Marines: 69 (12.6%) Missing: 82 (15%)
194	exp_enlisted	In August 1990, were you in the enlisted ranks, or an officer?	Num	EXP_ENLISTE D_.	1=Enlisted 2=Officer	Enlisted: 387 (70.9%) Officer: 77 (14.1%) Missing: 82 (15%)
195	exp_regular	In August 1990, were you in the Regular military, the Reserves, or the National Guard?	Num	EXP_REGULA R_.	1=Regular 2=Reserves 3=National Guard	Regular: 346 (63.4%) Reserves: 89 (16.3%) National Guard: 29 (5.3%) Missing: 82 (15%)
196	health_before	In general, how would you describe your health before you went to the Persian Gulf?	Num	EXP_PERSIAN _.	1=Excellent 2=Good 3=Fair 4=Poor	Excellent: 405 (74.2%) Good: 58 (10.6%) Fair: 1 (0.2%) Missing: 82 (15%)
197	health_now	In general, how would you describe your health now?	Num	EXP_HEALTH BEFORE_.	1=Excellent 2=Good 3=Fair 4=Poor	Excellent: 42 (7.7%) Good: 149 (27.3%) Fair: 192 (35.2%) Poor: 138 (25.3%) Missing: 25 (4.6%)
198	smoker_before	Were you a regular smoker before you deployed to the Persian Gulf region?	Num	EXP_HEALTH NOW_.	0=No 1=Yes	No: 369 (67.6%) Yes: 93 (17%) Missing: 84 (15.4%)
199	smoker_during	Were you a regular smoker while you were in the Persian Gulf region?	Num	EXP_PERSIAN GULF_.	0=No 1=Yes	No: 355 (65%) Yes: 107 (19.6%) Missing: 84 (15.4%)
200	smoker_now	Are you currently a regular smoker?	Num	EXP_SMOKER _.	0=No 1=Yes	No: 418 (76.6%) Yes: 44 (8.1%) Missing: 84 (15.4%)
201	curr_smoker	Current Smoker	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 480 (87.9%) Yes: 49 (9%) Missing: 17 (3.1%)

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202	exp_pbpillsyn	Taken pyridostigmine bromide (anti-nerve agent) pills	Num	YESNO.	0=No 1=Yes	No: 38 (7%) Yes: 224 (41%) Missing: 284 (52%)
203	amdyn	Have you ever served on Active Military Duty?	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 19 (3.5%) Yes: 304 (55.7%) Missing: 223 (40.8%)
204	AMD_Army	Active Military Duty: Army (check all that apply)	Num	AMDBR__0_.	0=Unchecked 1=Checked	Unchecked: 117 (21.4%) Checked: 211 (38.6%) Missing: 218 (39.9%)
205	AMD_Airforce	Active Military Duty: Air Force (check all that apply)	Num	AMDBR__1_.	0=Unchecked 1=Checked	Unchecked: 307 (56.2%) Checked: 21 (3.8%) Missing: 218 (39.9%)
206	AMD_Navy	Active Military Duty: Navy (check all that apply)	Num	AMDBR__2_.	0=Unchecked 1=Checked	Unchecked: 289 (52.9%) Checked: 39 (7.1%) Missing: 218 (39.9%)
207	AMD_Marines	Active Military Duty: Marines (check all that apply)	Num	AMDBR__3_.	0=Unchecked 1=Checked	Unchecked: 291 (53.3%) Checked: 37 (6.8%) Missing: 218 (39.9%)
208	AMD_OthBranch	Active Military Duty: Other Branch (check all that apply)	Num	AMDBR__4_.	0=Unchecked 1=Checked	Unchecked: 325 (59.5%) Checked: 3 (0.5%) Missing: 218 (39.9%)
209	amdyrs	How many years total were you on Active Duty?	Num	BEST12.		N: 302 NMiss: 244 Mean(SD): 8.7 (7.8) Median(IQR): 5.0 (4.0 - 12.0) Min - Max: 0.4 - 33.0
210	resyn	Have you ever served in the Reserves?	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 187 (34.2%) Yes: 130 (23.8%) Missing: 229 (41.9%)
211	Res_Army	Reserves: Army (check all that apply)	Num	RESBR__0_.	0=Unchecked 1=Checked	Unchecked: 208 (38.1%) Checked: 85 (15.6%) Missing: 253 (46.3%)

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212	Res_Airforce	Reserves: Air Force (check all that apply)	Num	RESBR__1_.	0=Unchecked 1=Checked	Unchecked: 286 (52.4%) Checked: 7 (1.3%) Missing: 253 (46.3%)
213	Res_Navy	Reserves: Navy (check all that apply)	Num	RESBR__2_.	0=Unchecked 1=Checked	Unchecked: 278 (50.9%) Checked: 15 (2.7%) Missing: 253 (46.3%)
214	Res_Marines	Reserves: Marines (check all that apply)	Num	RESBR__3_.	0=Unchecked 1=Checked	Unchecked: 272 (49.8%) Checked: 21 (3.8%) Missing: 253 (46.3%)
215	Res_OthBranch	Reserves: Other Branch (check all that apply)	Num	RESBR__4_.	0=Unchecked 1=Checked	Unchecked: 290 (53.1%) Checked: 3 (0.5%) Missing: 253 (46.3%)
216	resyrs	How many years total were you on Reserve Duty?	Num	BEST12.		N: 128 NMiss: 418 Mean(SD): 10.1 (9.0) Median(IQR): 6.5 (3.0 - 16.5) Min - Max: 0.5 - 42.0
217	ngyn	Have you ever served in the National Guard?	Num	YESNOP.	0=No 1=Yes 2=I prefer not to answer	No: 221 (40.5%) Yes: 96 (17.6%) Missing: 229 (41.9%)
218	NG_Army	National Guard: Army (check all that apply)	Num	NGBR__0_.	0=Unchecked 1=Checked	Unchecked: 212 (38.8%) Checked: 80 (14.7%) Missing: 254 (46.5%)
219	NG_Airforce	National Guard: Air Force (check all that apply)	Num	NGBR__1_.	0=Unchecked 1=Checked	Unchecked: 281 (51.5%) Checked: 11 (2%) Missing: 254 (46.5%)
220	NG_Navy	National Guard: Navy (check all that apply)	Num	NGBR__2_.	0=Unchecked 1=Checked	Unchecked: 292 (53.5%) Missing: 254 (46.5%)
221	NG_Marines	National Guard: Marines (check all that apply)	Num	NGBR__3_.	0=Unchecked 1=Checked	Unchecked: 290 (53.1%) Checked: 2 (0.4%) Missing: 254 (46.5%)

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222	NG_OthBranch	National Guard: Other Branch (check all that apply)	Num	NGBR__4_.	0=Unchecked 1=Checked	Unchecked: 292 (53.5%) Missing: 254 (46.5%)
223	ngyrs	How many years total were you on National Guard Duty?	Num	BEST12.		N: 92 NMiss: 454 Mean(SD): 10.2 (9.6) Median(IQR): 6.0 (4.0 - 18.0) Min - Max: 0.3 - 42.0
224	depos	Were you ever deployed overseas during your military service?	Num	YESNO.	0=No 1=Yes	No: 23 (4.2%) Yes: 292 (53.5%) Missing: 231 (42.3%)
225	deposw	If yes, where?	Char	\$500.		N: 305 (55.9%) NMiss: 241 (44.1%) Levels: 216 Listing: 25 Characters of Five Non-Missing Levels  .N 1990-1991 2000-2001 1991 Alaska and Korea Albania
226	deptom	Were you ever deployed or activated to serve domestically?	Num	YESNO.	0=No 1=Yes	No: 210 (38.5%) Yes: 100 (18.3%) Missing: 236 (43.2%)
227	deptomw	If yes, where?	Char	\$500.		N: 275 (50.4%) NMiss: 271 (49.6%) Levels: 92 Listing: 25 Characters of Five Non-Missing Levels  .N 1990-1991 2000-2001 A.P. HILL , VA Albuquerque NM Arizona

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228	comb	Were you ever in combat?	Num	YESNO.	0=No 1=Yes	No: 113 (20.7%) Yes: 199 (36.4%) Missing: 234 (42.9%)
229	combyr	If yes, when? List years:	Char	\$500.		N: 286 (52.4%) NMiss: 260 (47.6%) Levels: 70 Listing: 25 Characters of Five Non-Missing Levels  .N 1 12/1990-04/1991 1962, 1963 1965-1966, 1967-1968, 199
230	expao	Were you ever exposed to Agent Orange?	Num	YNNS.	0=No 1=Yes 2=Not Sure	No: 248 (45.4%) Yes: 8 (1.5%) Not Sure: 54 (9.9%) Missing: 236 (43.2%)
231	expchbio	Were you ever exposed to chemical or biological warfare agents during your military service?	Num	YNNS.	0=No 1=Yes 2=Not Sure	No: 46 (8.4%) Yes: 129 (23.6%) Not Sure: 128 (23.4%) Missing: 243 (44.5%)
232	anthvac	Were you ever given the anthrax vaccine during your military service?	Num	YNNS.	0=No 1=Yes 2=Not Sure	No: 29 (5.3%) Yes: 216 (39.6%) Not Sure: 63 (11.5%) Missing: 238 (43.6%)
233	pyridos	Have you ever taken pyridostigmine bromide (anti-nerve agent) pills?	Num	YNNS.	0=No 1=Yes 2=Not Sure	No: 51 (9.3%) Yes: 221 (40.5%) Not Sure: 38 (7%) Missing: 236 (43.2%)
234	solv	Did you ever have a job where you were exposed to Solvents and Fuels?	Num	SNACOA.	0=No 1=Yes 2=Don't Know	No: 67 (12.3%) Yes: 233 (42.7%) Don't Know: 23 (4.2%) Missing: 223 (40.8%)

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235	solvjob	If yes, was this exposure during your military job, civilian job, or both?	Num	SNACOB.	0=Military 1=Civilian 2=Both 3=I would prefer not to answer	N: 53 (9.7%) Military: 195 (35.7%) Civilian: 4 (0.7%) Both: 55 (10.1%) Missing: 239 (43.8%)
236	solvfreq	Over that time, how often would you say you were exposed?	Num	SNACOC.	1=Rarely 2=Sometimes 3=Often 4=Very often	N: 53 (9.7%) Rarely: 9 (1.6%) Sometimes: 48 (8.8%) Often: 86 (15.8%) Very often: 107 (19.6%) Missing: 243 (44.5%)
237	solvpp	Did you wear personal protection when you were exposed?	Num	SNACOD.	0=No 1=Yes 2=Sometimes	N: 53 (9.7%) No: 129 (23.6%) Yes: 40 (7.3%) Sometimes: 85 (15.6%) Missing: 239 (43.8%)
238	petr	Did you ever have a job where you were exposed to Petroleum Combustion Products?	Num	SNACOA.	0=No 1=Yes 2=Don't Know	No: 50 (9.2%) Yes: 246 (45.1%) Don't Know: 26 (4.8%) Missing: 224 (41%)
239	petrjob	If yes, was this exposure during your military job, civilian job, or both?	Num	SNACOB.	0=Military 1=Civilian 2=Both 3=I would prefer not to answer	N: 44 (8.1%) Military: 218 (39.9%) Civilian: 3 (0.5%) Both: 47 (8.6%) Missing: 234 (42.9%)
240	petrfreq	Over that time, how often would you say you were exposed?	Num	SNACOC.	1=Rarely 2=Sometimes 3=Often 4=Very often	N: 44 (8.1%) Rarely: 12 (2.2%) Sometimes: 43 (7.9%) Often: 91 (16.7%) Very often: 122 (22.3%) Missing: 234 (42.9%)

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241	petrpp	Did you wear personal protection when you were exposed?	Num	SNACOD.	0=No 1=Yes 2=Sometimes	N: 44 (8.1%) No: 148 (27.1%) Yes: 38 (7%) Sometimes: 81 (14.8%) Missing: 235 (43%)
242	lead	Did you ever have a job where you were exposed Lead?	Num	SNACOA.	0=No 1=Yes 2=Don't Know	No: 117 (21.4%) Yes: 154 (28.2%) Don't Know: 51 (9.3%) Missing: 224 (41%)
243	leadjob	If yes, was this exposure during your military job, civilian job, or both?	Num	SNACOB.	0=Military 1=Civilian 2=Both 3=I would prefer not to answer	N: 94 (17.2%) Military: 141 (25.8%) Civilian: 13 (2.4%) Both: 38 (7%) Missing: 260 (47.6%)
244	leadfreq	Over that time, how often would you say you were exposed?	Num	SNACOC.	1=Rarely 2=Sometimes 3=Often 4=Very often	N: 94 (17.2%) Rarely: 20 (3.7%) Sometimes: 77 (14.1%) Often: 58 (10.6%) Very often: 35 (6.4%) Missing: 262 (48%)
245	leadpp	Did you wear personal protection when you were exposed?	Num	SNACOD.	0=No 1=Yes 2=Sometimes	N: 94 (17.2%) No: 88 (16.1%) Yes: 41 (7.5%) Sometimes: 60 (11%) Missing: 263 (48.2%)
246	metal	Did you ever have a job where you were exposed to Other Metals?	Num	SNACOA.	0=No 1=Yes 2=Don't Know	No: 238 (43.6%) Yes: 27 (4.9%) Don't Know: 57 (10.4%) Missing: 224 (41%)
247	metaljob	If yes, was this exposure during your military job, civilian job, or both?	Num	SNACOB.	0=Military 1=Civilian 2=Both 3=I would prefer not to answer	N: 193 (35.3%) Military: 52 (9.5%) Civilian: 4 (0.7%) Both: 13 (2.4%) Missing: 284 (52%)

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248	metalfreq	Over that time, how often would you say you were exposed?	Num	SNACOC.	1=Rarely 2=Sometimes 3=Often 4=Very often	N: 193 (35.3%) Rarely: 13 (2.4%) Sometimes: 26 (4.8%) Often: 22 (4%) Very often: 6 (1.1%) Missing: 286 (52.4%)
249	metalpp	Did you wear personal protection when you were exposed?	Num	SNACOD.	0=No 1=Yes 2=Sometimes	N: 193 (35.3%) No: 33 (6%) Yes: 12 (2.2%) Sometimes: 23 (4.2%) Missing: 285 (52.2%)
250	pestic	Did you ever have a job where you were exposed to Pesticides?	Num	SNACOA.	0=No 1=Yes 2=Don't Know	No: 176 (32.2%) Yes: 94 (17.2%) Don't Know: 50 (9.2%) Missing: 226 (41.4%)
251	pesticjob	If yes, was this exposure during your military job, civilian job, or both?	Num	SNACOB.	0=Military 1=Civilian 2=Both 3=I would prefer not to answer	N: 143 (26.2%) Military: 102 (18.7%) Civilian: 7 (1.3%) Both: 20 (3.7%) Missing: 274 (50.2%)
252	pesticfreq	Over that time, how often would you say you were exposed?	Num	SNACOC.	1=Rarely 2=Sometimes 3=Often 4=Very often	N: 143 (26.2%) Rarely: 15 (2.7%) Sometimes: 46 (8.4%) Often: 45 (8.2%) Very often: 25 (4.6%) Missing: 272 (49.8%)
253	pesticpp	Did you wear personal protection when you were exposed?	Num	SNACOD.	0=No 1=Yes 2=Sometimes	N: 143 (26.2%) No: 79 (14.5%) Yes: 21 (3.8%) Sometimes: 30 (5.5%) Missing: 273 (50%)

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254	paint	Painting or Renovating your home frequently over any 6-month period?	Num	SNACHA.	0=No 1=Yes, but more than 10 years ago 2=Yes, within the past 10 years	No: 209 (38.3%) Yes, but more than 10 years ago: 41 (7.5%) Yes, within the past 10 years: 72 (13.2%) Missing: 224 (41%)
255	paintpp	Did you wear any personal protection during these activities, such as masks, boots, gloves, or other protective equipment?	Num	SNACHB.	0=No 1=Yes 2=Sometimes	N: 159 (29.1%) No: 33 (6%) Yes: 51 (9.3%) Sometimes: 29 (5.3%) Missing: 274 (50.2%)
256	refinish	Furniture Refinishing frequently over any 6-month period?	Num	SNACHA.	0=No 1=Yes, but more than 10 years ago 2=Yes, within the past 10 years	No: 290 (53.1%) Yes, but more than 10 years ago: 19 (3.5%) Yes, within the past 10 years: 11 (2%) Missing: 226 (41.4%)
257	refinishpp	Did you wear any personal protection during these activities, such as masks, boots, gloves, or other protective equipment?	Num	SNACHB.	0=No 1=Yes 2=Sometimes	N: 224 (41%) No: 8 (1.5%) Yes: 20 (3.7%) Sometimes: 7 (1.3%) Missing: 287 (52.6%)
258	auto	Auto Body Work frequently over any 6-month period?	Num	SNACHA.	0=No 1=Yes, but more than 10 years ago 2=Yes, within the past 10 years	No: 297 (54.4%) Yes, but more than 10 years ago: 15 (2.7%) Yes, within the past 10 years: 8 (1.5%) Missing: 226 (41.4%)
259	autopp	Did you wear any personal protection during these activities, such as masks, boots, gloves, or other protective equipment?	Num	SNACHB.	0=No 1=Yes 2=Sometimes	N: 234 (42.9%) No: 9 (1.6%) Yes: 11 (2%) Sometimes: 7 (1.3%) Missing: 285 (52.2%)

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260	glue	Work with Glues, Solvents, or Chemicals (such as those used in model building, fiberglass repair, etc.) frequently over any 6-month period?	Num	SNACHA.	0=No 1=Yes, but more than 10 years ago 2=Yes, within the past 10 years	No: 261 (47.8%) Yes, but more than 10 years ago: 30 (5.5%) Yes, within the past 10 years: 31 (5.7%) Missing: 224 (41%)
261	gluepp	Did you wear any personal protection during these activities, such as masks, boots, gloves, or other protective equipment?	Num	SNACHB.	0=No 1=Yes 2=Sometimes	N: 205 (37.5%) No: 17 (3.1%) Yes: 21 (3.8%) Sometimes: 23 (4.2%) Missing: 280 (51.3%)
262	pest	Pesticides while Gardening or Farming frequently over any 6-month period?	Num	SNACHA.	0=No 1=Yes, but more than 10 years ago 2=Yes, within the past 10 years	No: 271 (49.6%) Yes, but more than 10 years ago: 15 (2.7%) Yes, within the past 10 years: 34 (6.2%) Missing: 226 (41.4%)
263	pestpp	Did you wear any personal protection during these activities, such as masks, boots, gloves, or other protective equipment?	Num	SNACHB.	0=No 1=Yes 2=Sometimes	N: 213 (39%) No: 16 (2.9%) Yes: 21 (3.8%) Sometimes: 13 (2.4%) Missing: 283 (51.8%)
264	jewelry	Jewelry Making, Pottery Work, Studio Painting frequently over any 6-month period?	Num	SNACHA.	0=No 1=Yes, but more than 10 years ago 2=Yes, within the past 10 years	No: 308 (56.4%) Yes, but more than 10 years ago: 3 (0.5%) Yes, within the past 10 years: 7 (1.3%) Missing: 228 (41.8%)
265	jewelrypp	Did you wear any personal protection during these activities, such as masks, boots, gloves, or other protective equipment?	Num	SNACHB.	0=No 1=Yes 2=Sometimes	N: 243 (44.5%) No: 12 (2.2%) Yes: 3 (0.5%) Sometimes: 1 (0.2%) Missing: 287 (52.6%)

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266	Paraoxonase	Paraoxonase (Units/liter)	Num	BEST12.		N: 523 NMiss: 23 Mean(SD): 715.6 (478.1) Median(IQR): 631.0 (317.2 - 983.3) Min - Max: 42.0 - 2440.0
267	Diazoxonase	Diazoxonase (Units/liter)	Num	BEST12.		N: 523 NMiss: 23 Mean(SD): 9904.9 (4037.8) Median(IQR): 9432.8 (7177.6 - 12252) Min - Max: 766.0 - 24817
268	Arylesterase	Arylesterase (Units/ml)	Num	BEST12.		N: 440 NMiss: 106 Mean(SD): 132.9 (45.2) Median(IQR): 131.3 (106.1 - 159.1) Min - Max: -0.2 - 354.2
269	PON1_Status	PON1 Status	Char	\$2.		N: 523 (95.8%) NMiss: 23 (4.2%) Levels: 4 Listing: 25 Characters of Five Non-Missing Levels  QQ QR RR XX
270	draw_date	Draw Date (PON1)	Char	\$14.		N: 1 (0.2%) NMiss: 545 (99.8%) Levels: 1 Listing: 25 Characters of Five Non-Missing Levels  drawn 4/4/2016

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271	ship_date	Ship Date (PON1)	Num	DATE9.		N: 83 NMiss: 463 Min - Max: 10/16/2002 - 11/08/2006
272	BChE_ml	BChE - Units/ml (Plasma Factor .0115)	Num			N: 360 NMiss: 186 Mean(SD): 3.5 (1.1) Median(IQR): 3.3 (2.7 - 4.2) Min - Max: 1.5 - 7.4
273	BChE_l	BChE - Units/liter (Plasma Factor 15.5)	Num			N: 360 NMiss: 186 Mean(SD): 3484.8 (1073.7) Median(IQR): 3294.9 (2672.9 - 4200.5) Min - Max: 1470.9 - 7400.7
274	CMPA_UNITS_ML	CMPAase (ccor mean) converted to Units/ml (CMPA Factor 0.336)	Num			N: 366 NMiss: 180 Mean(SD): 24.8 (9.7) Median(IQR): 23.6 (17.9 - 30.5) Min - Max: 0.8 - 67.6
275	AREASE_HS_UNITS_ML	High Salt Arylesterase (acor mean) converted to Units/ml (Aryl HS Factor 0.335)	Num			N: 366 NMiss: 180 Mean(SD): 61.2 (26.2) Median(IQR): 63.2 (40.0 - 77.4) Min - Max: 1.8 - 160.3
276	PON1_Status_NonToxic	PON1 Status (Non-Toxic Assay)	Char	\$2.		N: 366 (67%) NMiss: 180 (33%) Levels: 4 Listing: 25 Characters of Five Non-Missing Levels  QQ QR RR XX

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277	Batch_Date_No nToxic	Batch Date	Num	MMDDYY8.		N: 366 NMiss: 180 Min - Max: 09/27/2019 - 09/08/2020