

# VETERANS HEALTH ADMINISTRATION

## Toxic Exposure and Health Outcomes in the 1990-1991 Gulf War Population: The HOME Gulf War Era Cohort Study

Presentation for: PACT Act Symposium

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# History of 1990-1991 Gulf War

- On January 16, 1991, President George H. W. Bush announced the start of what would be called Operation Desert Shield and Storm—a military operation to expel occupying Iraqi forces from Kuwait.
- A massive ground invasion followed on February 24, 1991. Coalition forces swiftly drove Iraq forces from Kuwait, advanced into Iraq and reached a cease-fire on February 28.
- U.S. forces suffered only 146 casualties, but the chronic disease that has followed as a result of service during the Gulf War is estimated to be in the hundreds of thousands (around 30% of deployed Gulf War Veterans)



# Gulf War Exposures

- Animal/insect bites
- Blood/bodily fluids
- CARC paint
- **Chemical and biological weapons**
- Depleted uranium
- Heat/cold injuries
- Heavy metals
- **Incoming fire, explosive events**
- Infections
- **Solvents, fuels and chemicals**
- Injuries, musculoskeletal wear and tear
- Loud noises
- **Oil well fires, smoke, and petroleum**
- **Pesticides**
- Physical and mental stressors
- Pyridostigmine bromide
- **Sand, dust, airborne particulate matter**
- Vaccinations



# Initial Reporting of Symptoms

- Soon after the end of the 1990-1991 Gulf War, Veterans began to report a variety of symptoms and illnesses
- In response the VA implemented the Gulf War Health Registry in 1992, which is still in use today
- DOD implemented the Comprehensive Clinical Evaluation Program in 1994
- Most common symptoms in both DoD and VA populations were identical: fatigue, joint pain, headache, memory loss, sleep disturbance, rash, and difficulty concentrating.



# VA HOME Gulf War Era Cohort Study

- National Health Survey of Gulf War Veterans and Their Families (1995-1997)
  - Cross-sectional, population-based study of 15,000 Gulf War and 15,000 Gulf War era Veterans across the United States
  - Sampled from the total known population of deployed (693,826) ½ and non-deployed (n=800,680) Veterans from the DoD Defense Manpower Data Center.
  - Random stratified sample, oversampled for:
    - Women (20%)
    - National Guard (27%)
    - Reserve (33%)



# VA HOME Gulf War Era Cohort Study

- National Health Survey of Gulf War Veterans and Their Families (1995-1997)
  - Mail and computer-assisted telephone interview (CATI) survey
  - Deployment exposures, functioning, general health, symptoms and diagnosed medical conditions
  - Gulf War Veterans reported a significantly higher prevalence of functional impairment, health care utilization, symptoms and medical conditions
  - **Identified a fatiguing deployment-related syndrome that included neurological impairment**

*Kang et al., 1999*



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# VA HOME Gulf War Era Cohort Study

## National Health Survey of Gulf War Veterans and Their Families (1995-1997)

Self-reported medical conditions in the last month among respondents

Condition	% Gulf War Veterans	% Gulf Era Veterans	% Difference
Arthritis	22.5	16.7	5.9
Disease of muscles	7.0	4.0	2.95
Eczema or psoriasis	7.7	4.4	3.34
Other dermatitis	25.1	12.0	13.6
Gastritis	25.2	11.7	13.5
Frequent diarrhea	21.2	5.9	15.3
Recurrent headache	32.6	14.9	17.7
Sinusitis	38.6	28.1	10.5
Bronchitis	11.2	7.7	3.6
Hypertension	11.4	7.6	3.8



# VA HOME Gulf War Era Cohort Study

- Longitudinal Health Study of Persian Gulf War Era Veterans (2005)
  - Follow up of all living members of the original cohort of 30,000 to evaluate the health of Gulf War Veterans and compare their health to Gulf War era Veterans.
  - A total of 9,970 Veterans responded (34%)
  - A higher proportion of Gulf War Veterans made at least one clinic or doctors visit because of illness within the previous 12 months
  - Gulf War Veterans reported taking more medicine for anxiety, depression or stress at the time of the survey than did Gulf War era Veterans
  - Gulf War Veterans had lower mean scores for both the physical and mental component of the SF-12 than Gulf War era Veterans
  - Gulf War Veterans were significantly more likely to have chronic fatigue-like illness and medically unexplained illness than Gulf War era Veterans

*Kang et al., 2009*



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# VA HOME Gulf War Era Cohort Study

## Longitudinal Health Study of Persian Gulf War era Veterans (2005)

Condition	%Gulf War Veterans	%Gulf Era Veterans	OR
Arthritis	36.9	32.4	1.20
Asthma	16.0	12.7	1.24
Chronic Fatigue Syndrome	18.2	9.0	1.98
COPD	14.2	9.6	1.47
Fibromyalgia	10.3	7.9	1.29
Irritable Bowel Syndrome	19.1	12.6	1.50
Neuralgia	13.4	9.7	1.39
Tachycardia	14.2	10.0	1.42

*Kang et al., 2009*



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# VA Gulf War Era Cohort Study

- Follow-up study of a National cohort of Gulf War and Gulf War era Veterans (2012-2014)
  - Resurveyed the cohort of 30,000 that was part of the study that VA conducted in 1995 to examine health status
  - 79% of the study population reported at least one chronic medical condition (82% in Gulf War Veterans, 78% in Gulf War era Veterans)
  - 45% screened positive for a mental health condition (52% in Gulf War Veterans and 39% in Gulf War era Veterans)
  - Average number of self-reported chronic medical conditions was 3.5 (3.7 in Gulf War Veterans and 2.9 in Gulf War era Veterans)

*Dursa et al., 2016*



# VA Gulf War Era Cohort Study

Follow-up study of a National cohort of Gulf War and Gulf War era Veterans (2012-2014)

Self-reported doctor-diagnosed conditions

Condition	%Gulf War Veterans	%Gulf Era Veterans	OR
Chronic fatigue syndrome	11.8	5.3	2.36
Irritable bowel syndrome	24.4	14.3	2.10
COPD	8.4	6.3	1.48
Tachycardia	8.1	5.9	1.47
Hypertension	43.0	40.0	1.22
Rheumatoid arthritis	9.9	7.9	1.40
Dermatitis	27.4	21.1	1.44
Migraine	20.3	16.3	1.30

*Dursa et. al., 2016*



# VA Gulf War Era Cohort Study

- Next follow-up of this cohort is planned to begin in the summer of 2023
- Modules to be included:
  - COVID-19 infection
  - Cancer diagnoses
  - Women's health issues-menopause and reproductive cancers
  - Marijuana and electronic cigarette use
  - Sleep
  - Mental health
  - Physical health
  - Diagnosed medical conditions
  - Gulf War illness



# VA Gulf War Era Cohort Study

- Largest and longest-running population-based longitudinal cohort study of Gulf War and Gulf Era Veterans to date
  - Includes historical data on toxic exposures
  - Over 30 publications
- Has informed healthcare and benefits policy



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