CSP 2006: Genomics of Gulf War Illness in Veterans

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CSP#2006- the Basics

- Genome-Wide Association Study (GWAS) of Gulf War Illness among Gulf War Veterans

- Million Veteran Program

  - "re-contact" alpha-test project

- Drew Helmer (E. Orange) and Dawn Provenzale (Durham)

- Sample from MVP

  - options to expand recruitment

- Phenotyping w/ questionnaire

  - electronic record validation

- Genotyping using MVP chip

  - sequencing in future
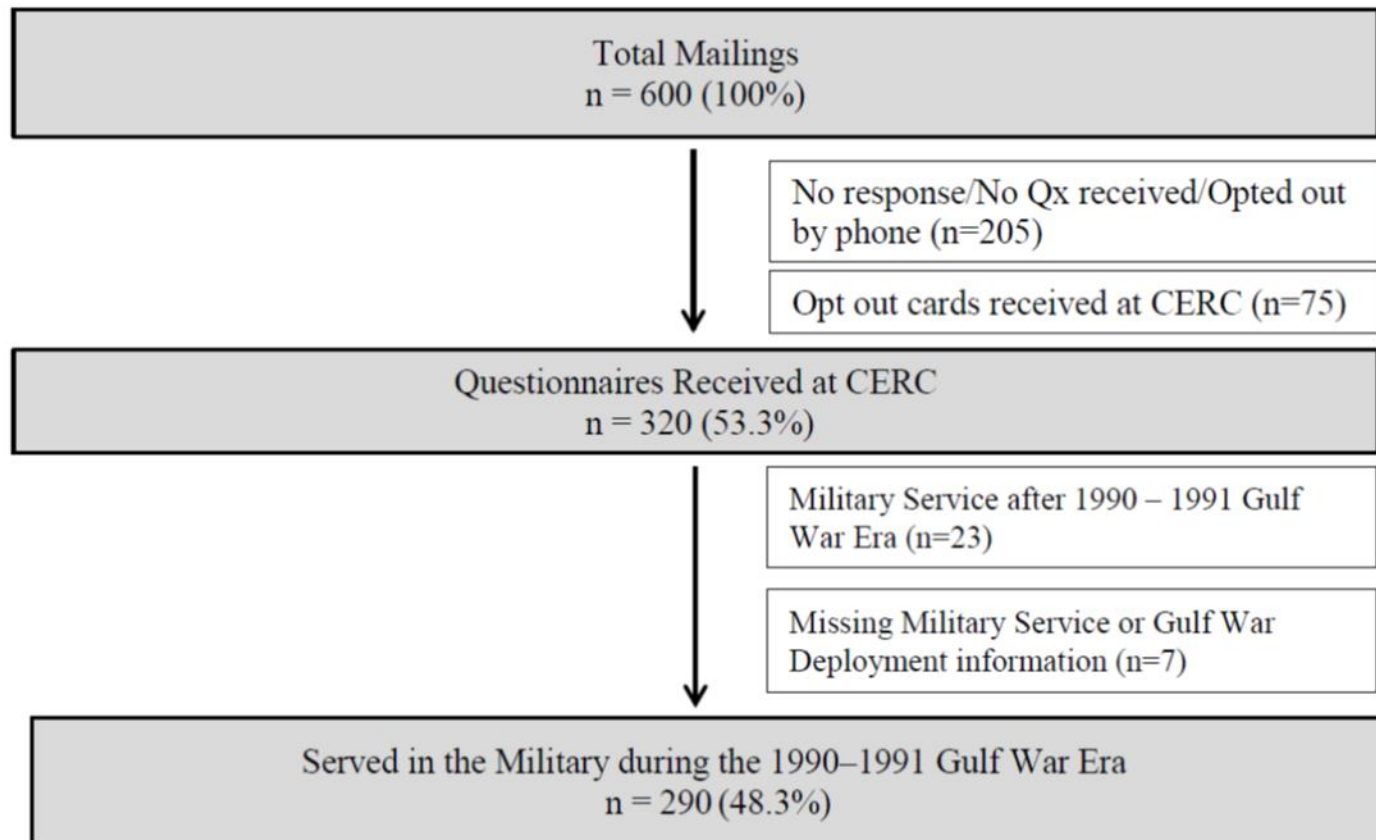
CSP 2006- Key Attributes

- Population - US military service members on active duty during the Gulf War Era
- Sample- drawn from Million Veteran Program participants
    - Gulf War Era- estimated n=50,000
    - Estimate 7500 GWI Veterans and 7500 not-GWI Veterans
- Phenotype-
    - Gulf War Illness status (Kansas and other criteria)
    - Derived from symptoms and exclusion criteria reported on a survey
    - Survey developed from CSP 585 and original Kansas questionnaire
- Genotype-
    - MVP chip (genome wide association study)
    - Genetic analysis based on MVP standards

CSP 2006- Pilot

<u>Field-testing of protocol</u>:

• mail N=600 survey packets to national sample of MVP enrollees

• estimate mail return and completion rates

• ascertain adequacy of questionnaire for phenotyping

• develop algorithm to identify cases and controls from survey responses

CSP 2006- Pilot experience

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┌─────────────────────────────────────────┐
│              Total Mailings              │
│            n = 600 (100%)                │
└─────────────────────────────────────────┘
                  │
                  │    ┌──────────────────────────────────────┐
                  │    │ No response/No Qx received/Opted out │
                  │    │ by phone (n=205)                     │
                  │    ├──────────────────────────────────────┤
                  │    │ Opt out cards received at CERC (n=75)│
                  ▼    └──────────────────────────────────────┘
┌─────────────────────────────────────────┐
│       Questionnaires Received at CERC    │
│            n = 320 (53.3%)               │
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                  │
                  │    ┌──────────────────────────────────────┐
                  │    │ Military Service after 1990 – 1991 Gulf│
                  │    │ War Era (n=23)                       │
                  │    ├──────────────────────────────────────┤
                  │    │ Missing Military Service or Gulf War │
                  │    │ Deployment information (n=7)         │
                  ▼    └──────────────────────────────────────┘
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│ Served in the Military during the 1990–1991 Gulf War Era │
│            n = 290 (48.3%)               │
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CSP 2006- Current Status

- Central IRB review is pending
- Office of Management & Budget review of the survey will be required
  - 6-12 months
- Writing a study design paper
- Planning analysis of the pilot data

CSP 2006- Just the Beginning

- GWAS is an initial approach to genomic analysis
  - Candidate gene analysis, sequencing, gene x environment interactions
- Other approaches to phenotyping
  - Other conditions, specific symptoms, biomarkers, different classification systems
- Building on MVP platform- great commitment , enthusiasm for figuring things out

Questions?