

# VET Registry *Twin Times*

## WELCOME

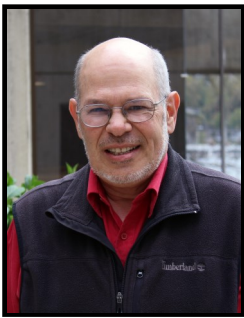
Welcome to the 13th edition of the Vietnam-Era Twin (VET) Registry newsletter, the *Twin Times*. In this issue you will find information about current and upcoming VET Registry studies as well as the latest news in twin research. Your continued participation in the VET Registry helps researchers make scientific advances to better inform the health and healthcare of Veterans like you.

We hope you enjoy this edition of the annual newsletter.

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## VET Registry Researcher Spotlight: Dr. Jack Goldberg



Seattle ERIC Senior Epidemiologist Dr. Jack Goldberg retired from the VA in June 2018. His 35-year VA career included the launch and growth of the Vietnam-Era Twin (VET) Registry, and conducting research that improved how we understand the impact of health

conditions, such as posttraumatic stress disorder (PTSD). Prior to his VA career, Dr. Goldberg earned his doctoral degree in epidemiology from the University of Illinois, Chicago. He taught at the University of Illinois School of Public Health for the Epidemiology and Biostatistics Program, and at the University of Washington School of Public Health for the Department of Epidemiology.

Dr. Goldberg joined the VET Registry research team as an Epidemiologist when it was getting started in the early 1980s. He played an important role in the development of the VET Registry, including launching studies that measured the course and prevalence of PTSD in aging Vietnam-era Veterans. One example is the Veterans Health Study (VHS). Many of you may remember participating in the mailed questionnaire and/or telephone interview portions of that study. VHS was a

longitudinal follow-up examination of PTSD in VET Registry members and Dr. Goldberg was Co-Chair of the study. Research findings from VHS suggested that 1) PTSD persists among many Vietnam-era Veterans-especially those who were exposed to high levels of combat during the war; 2) these Veterans have a diminished quality of life due to PTSD; and 3) there is a substantial genetic vulnerability to PTSD. These findings highlight how important it is to provide PTSD services to Veterans *throughout* their lifetimes.

The Seattle ERIC is immensely grateful for Dr. Goldberg's scientific contributions. His legacy will continue in many ways, although most notable is the VET Registry, a valuable scientific resource that will be available for years to come.

Dr. Goldberg's farewell lecture, *The VET Registry: A 30 year compendium of scientific research*, is available on the Seattle ERIC website at: <https://www.seattle.eric.research.va.gov/VETR/30-Year-Compendium-Presentation.asp> Slides, transcript, and video are available. All publications from VET Registry research, including a select paper from the Veterans Health Survey, can be found online at <https://www.seattle.eric.research.va.gov/VETR/Publications.asp>.

Soon Vietnam-Era Twin (VET) Registry members will have the opportunity to join the VA National Posttraumatic Stress Disorder Brain Bank (PTSDDBB). The PTSDDBB is used by researchers to study brain disorders and identify risk factors for conditions such as PTSD. Once enrolled, participants are asked to complete questionnaires about their health every 6-12 months and to donate their brain upon death. Brain donations are encouraged even if the donor has never been diagnosed with PTSD. We surveyed 104 VET Registry twin members in 2018 about their willingness to enroll in a brain bank and approximately 25% of the twins expressed an interest. Over the next several months, the Seattle

ERIC may send you more information about enrolling in the PTSD Brain Bank.

The PTSDDBB is directed by Dr. Matthew Friedman at the VA National Center for PTSD's Executive Division in White River Junction, Vermont. The PTSDDBB is part of the VA Biorepository Brain Bank.

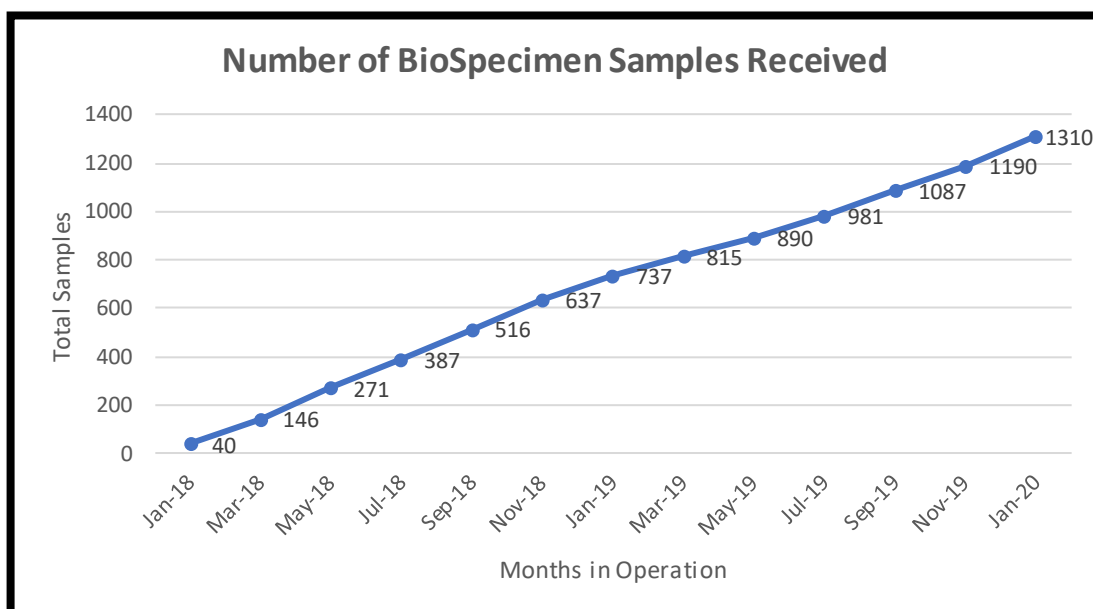
If you have any questions please call 1-800-329-8387, ext. 61964 to talk to a VET Registry staff member.

## Biospecimen Collection

In May 2017, the Vietnam-Era Twin (VET) Registry began a new biospecimen collection project to enhance the Registry's biospecimen repository, also known as a biorepository. Since then, VET Registry members have donated over 1,000 saliva samples. Saliva components such as DNA from buccal cells can be extracted from the saliva for use in future VET Registry research studies.

Our goal is to collect saliva samples from all VET Registry members who are willing and able to participate. The graph below plots our collection efforts and how we hope to continue data collection efforts over the next several years.

If you would like more information, or have not received a kit and would like to participate, call 1-800-329-8387, ext. 61964 to speak to a VET Registry staff member.



## Helpful Resources for Veterans

The National Resource Directory (NRD) is a website that connects Veterans and their families to support services and programs. A link to the NRD webpage can be found at the bottom left-hand corner of the VA homepage ([www.va.gov](http://www.va.gov)), under **Veteran programs and services**. The NRD centralizes access to information on recovery, rehabilitation and reintegration services and programs for wounded, ill, and injured Veterans and their families. Its focus is to improve care coordination by providing comprehensive information on programs available through federal, state, and local government agencies and other associations. The NRD offers information on benefits and compensation, education and training,

employment, family and caregiver support, health, post-traumatic stress disorder (PTSD), and more. It also includes resources specific to Vietnam Veterans.

One of these resources is the Vietnam Veterans Memorial Fund Program (VVMF). The VVMF is a non-profit organization authorized by the U.S. Congress in 1980. The VVMF manages a program called *In Memory*, which honors and recognizes Vietnam-era Veterans for their courage, heroism, and sacrifice. To learn more about the VVMF and its *In Memory* program please visit [www.vvmf.org](http://www.vvmf.org).

## Featured Research Article: Vietnam Era Twin Study of Aging

The Vietnam Era Twin Study of Aging (VETSA) is a set of observational, epidemiologic examinations that investigates genetic and environmental influences on cognition and aging within the VET Registry cohort. The VETSA study design is longitudinal, meaning researchers collect data from the same participants at different time points. Enrollment and data collection activities for time point 3 were completed January 2019. In March 2019, VETSA researchers published an article titled: *Body Mass Trajectories and cortical thickness in middle aged men: a 42-year longitudinal study starting in young adulthood*. The article was published in *Neurobiology of Aging* (see reference below).

The article describes their investigation into the relationship between being overweight or obese throughout adulthood and brain atrophy in later life. Brain or cerebral atrophy is the loss of brain cells (neurons) in the brain and the connection between those neurons. Evidence shows that being overweight or obese at midlife is a strong risk factor for greater brain atrophy and Alzheimer's disease later in life but we do not know if the risk factor actually causes the disease. Prior to this study, little research had been conducted that examines changes in body mass index (BMI) throughout adulthood and its relationship to brain atrophy.

VETSA researchers collected measures of BMI in a sample of 373 men from the study cohort at ages 20, 40, 56, and 62 years. Measures of cortical thickness and white matter volume in their brains were collected via structural magnetic resonance imaging (MRI) at a mean age of 62 years. The researchers found that those who followed an obese trajectory (N= 171) had a thinner cortex compared with those on a normal or lean trajectory (N= 202). Results were similar for obese versus non-obese adults at age 62. There were no significant differences in white matter volume between the individuals who followed the obese versus normal/lean trajectory. Taken in the context of other research studies, these associations between BMI at midlife and brain structures suggest that this risk factor may increase the risk for cognitive decline in later life.

Reference: Franz CE, Xian H, Lew D, et al. Body mass trajectories and cortical thickness in middle-aged men: a 42-year longitudinal study starting in young adulthood. *Neurobiology of Aging*. 2019;79:11-21.

Scientists in Australia recently identified the second known case of semi-identical or **sesquizygotic** twins in the world, and it is the first case ever to be documented during pregnancy. Below, we provide a summary of the fascinating case detailed in an article published in the *New England Journal of Medicine* (Gabbett, 2019), and key term definitions.

Doctors thought a 28-year old woman was pregnant with identical, or **monozygotic** twins, but an ultrasound scan at 14 weeks revealed a male twin and a female twin—not possible for monozygotic twins! Researchers performed a **genomic analysis** (process to determine nucleotide order of DNA molecules) of each twin and each parent. They then compared DNA from each twin to each parent to determine the amount of shared DNA.

The genomic analysis revealed that the twins had identical maternal DNA, but they only shared 77.7% paternal DNA. This finding led scientists to determine that the twins are sesquizygotic—a rare version of **twinning** which is an intermediate between monozygotic and **dizygotic**.

Sesquizygotic twinning occurs when one egg is fertilized by two sperm, an event called **dispermic** fertilization. This leads to the formation of a **zygote** with 1 set of maternal chromosomes but 2 sets of paternal **chromosomes**. The zygote then divides the 3 sets of chromosomes consisting of **biparental** (chromosomes from both parents) and **uniparental** (chromosomes from only 1 parent) cells. The biparental lineage outcompetes the uniparental lineage, leading to a twinning event where the group of biparental cells split into two, creating two fetuses within the single egg. This means each twin in a sesquizygotic pair inherits a blend of chromosomes from both sperm.

The researchers examined genetic data from 968 fraternal twins and their parents and could not identify even a single other case of sesquizygotic twins. Based on this, they concluded that sesquizygotic twinning is extremely rare.

**References:** Gabbett, M. T. (2019). Molecular Support for Heterogonesis Resulting in Sesquizygotic Twinning. *The New England Journal of Medicine*. doi:10.1056/NEJMoa1701313

## Key Terms:

- **Biparental cells:** Chromosomes from both parents.
- **Chromosomes:** Structure of nucleic acids and protein that carries genetic information in the form of genes.
- **Dispermic:** Two sperm.
- **Dizygotic:** Fraternal twins who originate from 2 different eggs fertilized by different sperms. Their genotypes are similar to any non-twin siblings, typically sharing 50% of their maternal and paternal genome (complete set of genetic material present in a cell).
- **Genomic analysis:** Identification, measurement or comparison of genomic features such as order of nucleotides in a DNA sequence, structural variations, and/or gene expression.
- **Monozygotic:** Identical twins who share complete DNA information (both twins originate from a single egg fertilized by a single sperm).
- **Sesquizygotic:** Twins who are not genetically identical but share more alleles than fraternal twins.
- **Twinning:** Multiple fetus pregnancy.
- **Uniparental cells:** Chromosomes from only one parent.
- **Zygote:** Fertilized egg.



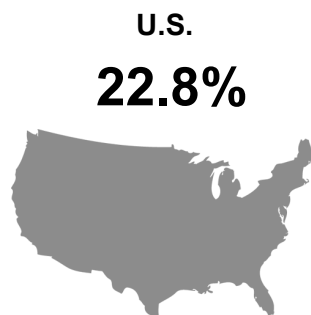
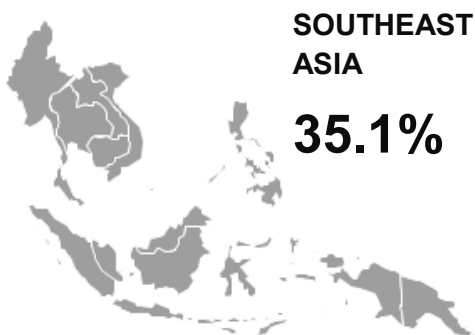
The Vietnam-Era Twin (VET) Registry has held a total of seven focus groups across the US from 2015 to 2018. The main goal of focus groups is to learn what influences a Registry member's decision to participate in research and to find out ways the VET Registry can make adjustments based on those influences. The 2018 focus groups were held in the Newark area in New Jersey. Main findings from all previous focus groups can be found on the Seattle ERIC website at <https://www.seattle.eric.research.va.gov/VETR/Publications.asp>.

Past focus group attendees have expressed that they would like to learn more about the VET Registry cohort. We hear you, and will be sharing more facts about the VET Registry cohort in future newsletters! Below, along with photos of the 2018 New Jersey focus groups, you can find a depiction of the distribution of where VET Registry twin members served during the Vietnam era (1964-1975). While all VET Registry twin members served on active duty in the U.S. military during the Vietnam era, 35.1% served overseas in South-east Asia.



Thanks to participants of our 2018 VET Registry focus groups in New Jersey.

## WHERE DID VET REGISTRY TWINS SERVE?



Seattle ERIC | S-152-E  
Vietnam-Era Twin Registry  
VA Puget Sound Health Care System  
1660 South Columbian Way  
Seattle, WA 98108



**ADDRESS SERVICE REQUESTED**

**CONTACT UPDATE FORM: *Please update your information***

TITLE \_\_\_\_\_ FIRST NAME \_\_\_\_\_ MI \_\_\_\_ LAST NAME \_\_\_\_\_

I'm a (check one):  VET-R Twin  Offspring of a VET-R Twin  Mother of VET-R Offspring

Address 1: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Zip: \_\_\_\_\_ - \_\_\_\_\_ Country: \_\_\_\_\_

Address 2: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

Zip: \_\_\_\_\_ - \_\_\_\_\_ Country: \_\_\_\_\_

Home Phone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Cell Phone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Work Phone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Other Phone: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Type: \_\_\_\_\_

Email 1: \_\_\_\_\_ Email 2: \_\_\_\_\_

If you decide to withdraw your membership in the Registry now or at any time in the future, contact us toll free at 1-800-329-8387 ext. 61964.



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