Million Veteran Program

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What is MVP?

VA's Million Veteran Program

- Launched in 2011, MVP is a **national VA research program** and one of the world's largest programs on genetics and health

- Designed to advance precision health care by learning how genes, lifestyle, military experiences, and exposures affect health and illness

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How does a Veteran join?
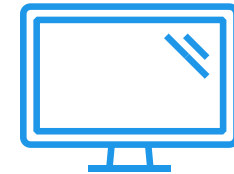
01 Complete Consent Process

and allow access to medical records.

Visit a participating VA Healthcare Center (1-866-441-6075) or enroll online at mvp.va.gov

02 Provide Blood Specimen

at the time of your visit.

at a VA Medical Center or schedule an option online at mvp.va.gov

03 Complete Surveys

about health, lifestyle, and military experience.

Either mailed to you or filled out online at mvp.va.gov

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Join from anywhere!

- Any Veteran can join online at **mvp.va.gov** or by calling 866-441-6075 to schedule an appointment at the nearest MVP enrollment site.

By the numbers…

930K+

Veteran Participants

(30K+ joined online)

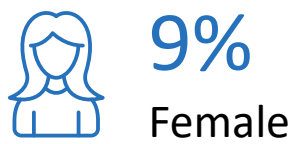**The world's largest genomic database**

Linked to a health care system

650K+

Genotyped samples

MVP Cohort

Based off the first 850,000 Veterans in MVP:

91% Male | **9%** Female
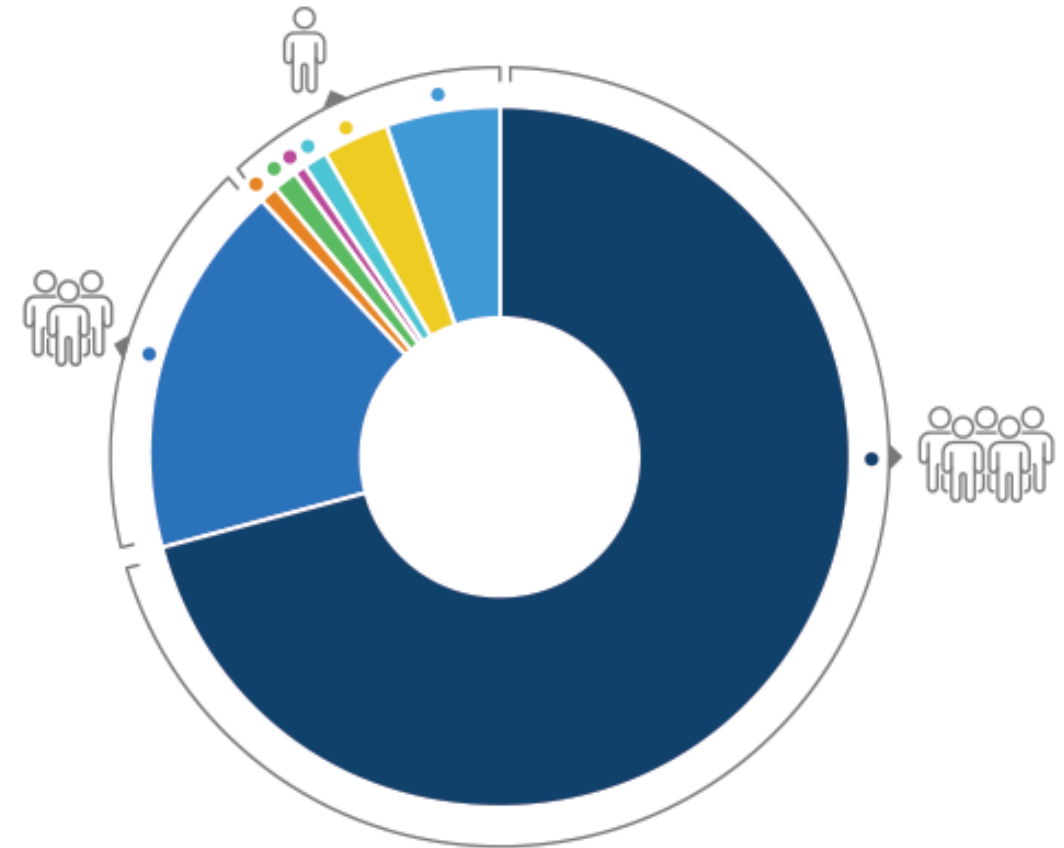
~70K (or 8.2%) Hispanic

147K+ (or 17.3%) Black

MVP has the largest cohort of people of African ancestry of any research program in the world

Average age is 67

with largest cohort (35.8%) aged 70–79 (81% over 50)

- White **70.99%**
- Black or African American **17.32%**
- American Indian or Alaskan Native **0.75%**
- Asian **1.07%**
- Native Hawaiian or Other Pacific Islander **0.47%**
- Other **1.35%**
- Multi-Racial **2.88%**
- Missing **5.18%**

MVP Science

70+
Projects

600+
Researchers

35+
VA and DOE
participating sites*

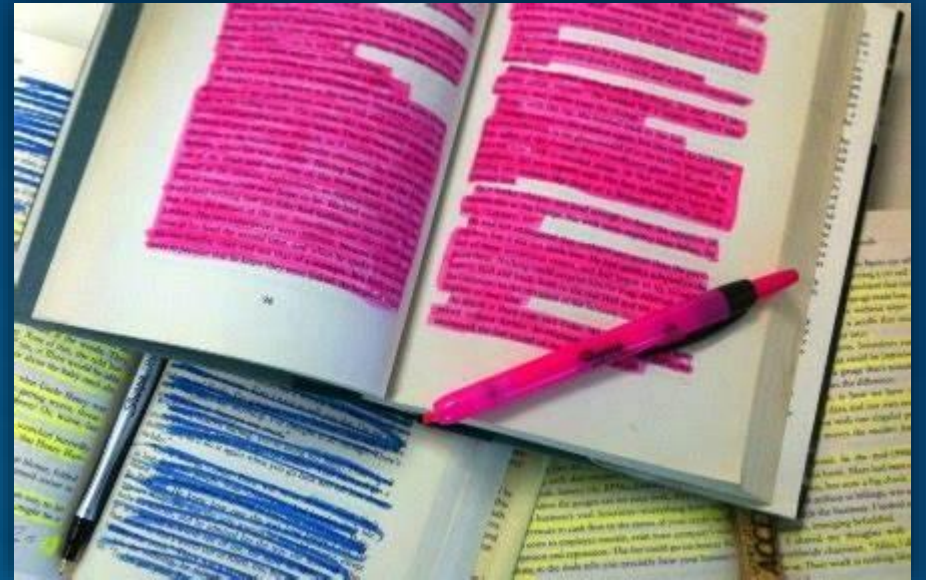**200+**
Publications

*Partnership to leverage Department of Energy (DOE) computing infrastructure and expertise

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MVP is a Central Part of High-Priority Activities

Hannon Act

Sec. 305: Launch a precision brain and mental health initiative (validate brain and mental health biomarkers and secure data sharing and clinical translation)

Cancer Moonshot 2.0

To reduce the death rate from cancer by at least 50% over the next 25 years and improve the experience of people and their families living with and surviving cancer through expedited research

PACT Act/Military Exposures

Honoring our Promise to Address Comprehensive Toxics Act

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MVP-MIND: Measures Investigating Neuropsychiatric Disorders

Will examine how lifestyle, genes, and military experiences affect mental health and substance use

Information will advance the understanding of genetics as it relates to mental health and substance use disorders

Will potentially help to identify new biomarkers and treatments

What data is being used for research?

MVP Data Universe

◉ Molecular Data

◉ Self-reported
MVP surveys

◉ Biospecimen

MVP Participant

◉ VA - Clinical
VINCI, CDW/NDS

◉ Non-VA
NDI, CMS, DoD

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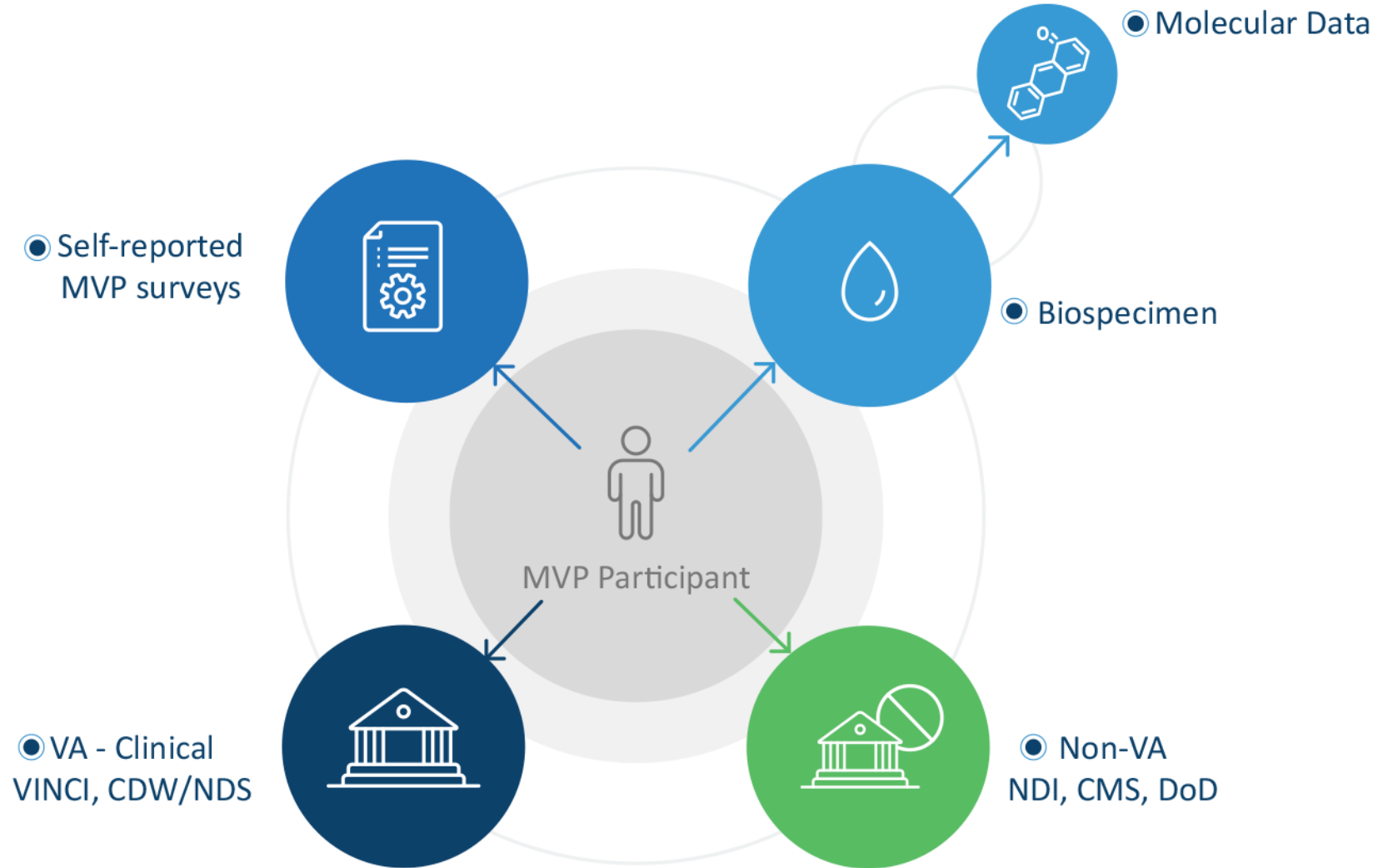
MVP Surveys

- Baseline Survey - health, health history, family history (558,000)

- Lifestyle Survey – nutrition, exercise, smoking, substance use, military exposure, mental health (437,000)

- Gulf War Survey (44,000)

- COVID-19 Survey (255,000)

- Mental Health Survey (launching soon)

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Military Exposure Data in MVP Enrollees

Military Exposure	MVP Enrollees (N=554,884)	
	N	%
Agent Orange		
Yes	113,348	20.43
No	323,442	58.29
Not Sure	112,201	20.22
Missing	5,893	1.06
Chemical/Biological Warfare Agents		
Yes	54,716	9.86
No	300,200	54.10
Not Sure	192,700	34.73
Missing	7,268	1.31
Anthrax Vaccine		
Yes	83,111	14.98
No	271,727	48.97
Not Sure	192,134	34.63
Missing	7,912	1.43
Pyridostigmine Bromide (Anti-Nerve Agent Pills)		
Yes	23,643	4.26
No	408,516	73.62
Not Sure	9,436	1.70
Missing	113,289	20.42

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MVP data: Molecular and Phenomic

Data available now

- **Electronic Health Records (EHR) data**
- **Baseline Survey**
- **Lifestyle Survey**
  - Nutrition data
- **Genotype data (650K)**
- **Whole Genome Sequence (~100K)**
- **Methylation (~45K)**

Data available later

- **Ethnic focus genotype data**
- **COVID-19 Survey data**
- **Metabolomics**

Making VA Data Work for Veterans

VA
(VINCI & Genisis)

- Behind the VA firewall
- Coded data
- Clinical, genotype and survey data
- Data assimilation, aggregation & storage
- Data curation
- Data exploration & visualization
- Self-service tools

DOE
(Oak Ridge National Lab)

- Secure PHI computing enclave
- Coded data
- VA clinical data and MVP genotype and survey data
- Advanced Computing Environment
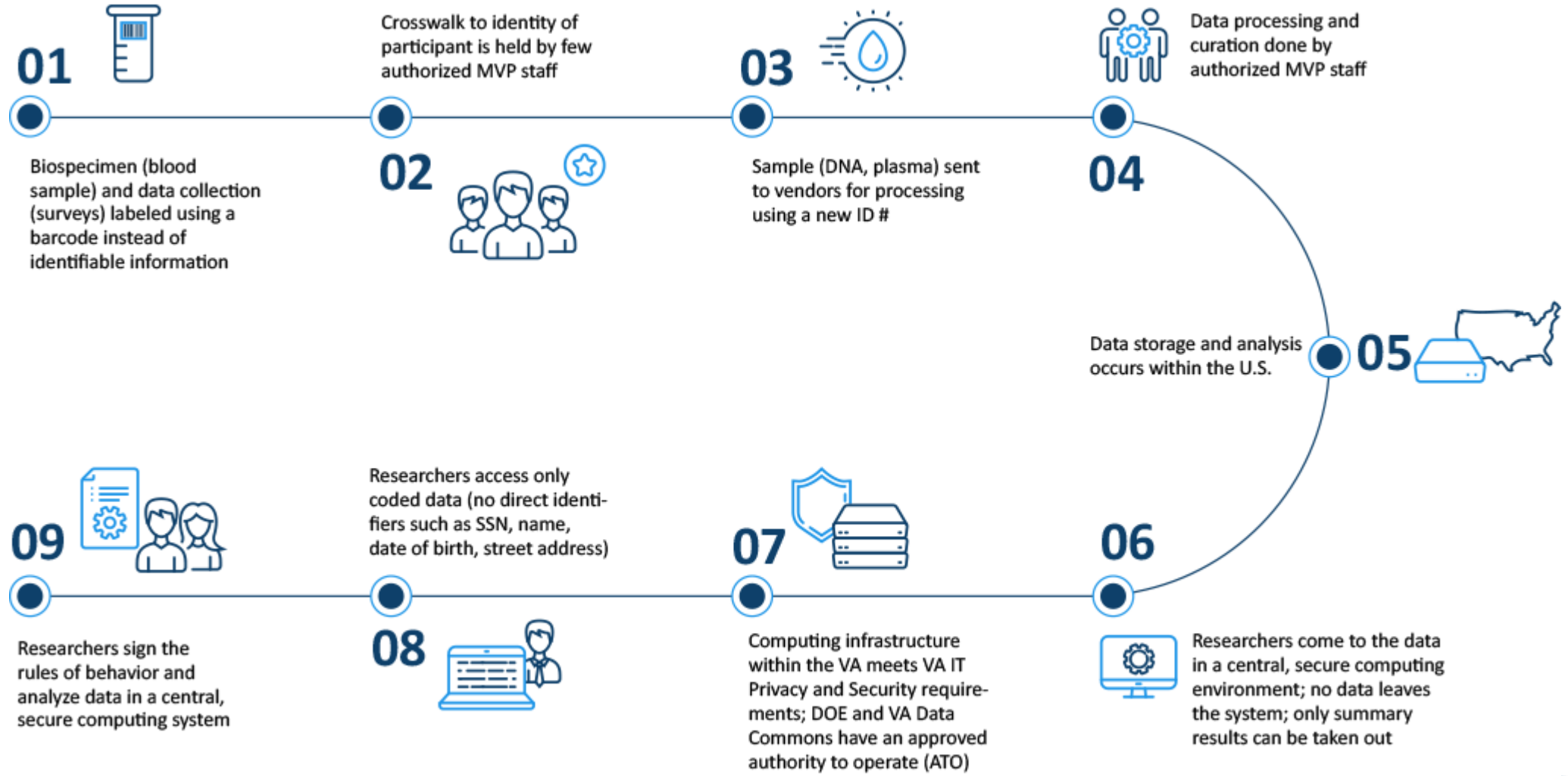- Model Building & Refinement

VA Data Commons
(U of Chicago)

- Pilot-testing phase
- Cloud-based secure access
- Deidentified VA clinical and MVP data
- Access to researchers from within and outside the VA

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Information and Data Security

01 Biospecimen (blood sample) and data collection (surveys) labeled using a barcode instead of identifiable information

02 Crosswalk to identity of participant is held by few authorized MVP staff

03 Sample (DNA, plasma) sent to vendors for processing using a new ID #

04 Data processing and curation done by authorized MVP staff

05 Data storage and analysis occurs within the U.S.

06 Researchers come to the data in a central, secure computing environment; no data leaves the system; only summary results can be taken out

07 Computing infrastructure within the VA meets VA IT Privacy and Security requirements; DOE and VA Data Commons have an approved authority to operate (ATO)

08 Researchers access only coded data (no direct identifiers such as SSN, name, date of birth, street address)

09 Researchers sign the rules of behavior and analyze data in a central, secure computing system

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What have we learned?

Areas of MVP Research

PTSD	Tinnitus
Multi-substance use	Osteoarthritis
Schizophrenia and bipolar disorder	Suicidality
Cardiovascular disease and Cardiometabolic disorders	Phenotyping methodologies
Diabetes and complications	Parkinson's disease
Age related macular degeneration	Alzheimer's disease
Gulf War Illness	Traumatic brain injury
Breast cancer	Pharmacogenomics of opioid agonists
Prostate cancer	Kidney injury
Lung cancer	Multiple myeloma
COVID-19 was added in 2020	

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Biological Pathways of Suicide Risk Identified

30 Biological pathways identified related to an increased risk of suicide attempt

- Identifying biological factors related to suicide risk could help us identify risk factors and avenues for treatment.

American Society of Human Genetics, Oct. 18, 2021

Gene Variants Increase COVID-19 Kidney Risk in Patients with African Ancestry

990 Veterans with African ancestry who were hospitalized with COVID-19 were included in the study

- Findings suggest that a genetic risk assessment could help predict kidney risk from COVID-19 in patients with African ancestry.

- Veterans of African ancestry with specific gene variants were at heightened risk of acute kidney injury from COVID-19.

JAMA Internal Medicine, Jan. 28, 2022

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Study Sheds New Light on Biology of PTSD

A 2019 study of more than

165,000

MVP participants identified several genes related to re-experiencing traumatic memories

- An MVP study found potential genetic links between PTSD and hypertension – meaning that existing hypertension drugs could potentially be useful in treating PTSD.

- A follow-up study identified a certain genetic marker linked to PTSD more commonly found in Black Veterans.

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To 1 Million and beyond!

Looking Ahead

- Reach **1,000,000+ Veteran enrollees**

- **Increase diversity** of enrollees (gender, age, race, ethnicity, medical condition) through focused campaigns

- Broadly **expand data access** to researchers within and outside VA through the VA Data Commons

- **Increase breadth and scope of scientific projects** and scientific products in all relevant areas of health, including mental health and effect of military exposures

- **Move scientific discoveries into the clinic** to begin offering precision healthcare to Veterans

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A Partnership with Veterans

Thank you to the Veterans, MVP staff, and collaborators who make this research possible.

mvp.va.gov

MVPComms@va.gov